

# Curriculum Vitae of Fahad Saeed, Ph.D.

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# 1 Current Fields of Interests and Research Activities

## **Executive Summary of Research, Teaching and Service activities:**

Fahad Saeed is a tenured Associate Professor in the School of Computing and Information Sciences at Florida International University (FIU), Miami FL and is the director of Saeed Lab which is a parallel computing and data science group: (<https://saeedlab.cis.fiu.edu/>). Prior to joining FIU, Prof. Saeed was an Assistant Professor (2014-2018) in the Department of Electrical & Computer Engineering and Department of Computer Science at Western Michigan University (WMU), Kalamazoo Michigan. He was tenured and promoted to the rank of Associate Professor at WMU in July 2018. He also serves as visiting scientist at National Institutes of Health (NIH) Bethesda, Maryland. Dr. Saeed was a Research Fellow in the National Institutes of Health (NIH) from 2011 to 2014 and a postdoctoral fellow from 2010-2011. He received his Ph.D. in the Department of Electrical and Computer Engineering, University of Illinois at Chicago (UIC) in 2010. He has served as visiting scientist in world-renowned prestigious institutions such as ETH Zurich, Swiss Institute of Bioinformatics (SIB) and National Institutes of Health (NIH). He has published 90+ peer-reviewed research papers in leading proceedings, and journals, 1 Book Chapter, editor for 4 Conference Proceedings, and 3 special issue journals. 1 monologue book that got published in Fall 2022 (published by Springer, 200 pages).

Dr. Saeed's research interests are at the intersection of machine-learning, high performance computing and real-world applications, especially in computational biology. His research focus is to design and develop machine-learning models, and high performance computing (HPC) foundations for practical big omics data analysis. The proposed tools will reveal tremendous biological insight such as novel genes and proteins and is a crucial step towards understanding the genomic, proteomic and evolutionary aspects of species in the tree of life. His more recent research focus has been toward developing machine-learning models to characterize mental disorders including ADHD, Alzheimer's, and Autism Spectrum. More info about his research activities can be found at <https://saeedlab.cis.fiu.edu/> and <https://prof-s.github.io/>

Dr. Saeed's research is supported by highly competitive grants and has been awarded over **US\$ 3.9 million** in external research funds - with more than **US\$ 2.7 million** as a PI. Out of this he has bought in **US\$ 2.1 million** to CEC and KFSCIS at FIU as a PI since Aug 2018. External fund raising (**US\$ 10 Million + US\$ 6 Million**), Intramural funds (**US\$ 895,107**) and computing allocations are not included in this amount.. The grants that he has acquired are some of the most highly competitive and prestigious federal grant in the US which includes NSF CRII award, NSF CAREER award and NIH R01 award. He has been awarded the NSF Research Initiation Initiative (CRII) Award and NSF Faculty Early Career Development (CAREER) Award which is NSF's most prestigious award in support of early-career faculty who have the potential to serve as academic role models in research and education. NIH R01 grant is the most sought after, oldest, and highly competitive grant mechanism at NIH, in the US and worldwide. This is a testament and an acknowledgement by his peers and federal agencies about highly competitive and cutting-edge leadership he is providing to the interdisciplinary field of machine-learning and computational biology.

He has served as the program co-chair of the Bioinformatics and Computational Biology (BI-CoB) Conference and IEEE International Conference on Bioinformatics and Biomedicine (IEEE BIBM). He is also a founding chair of IEEE Workshop on HPC solutions to Big Data Computational Biology (IEEE HPC-BCB). He also serves on the editorial board of Springer Journal of Network Modeling Analysis in Health Informatics and Bioinformatics, Associate Editor at Journal of the American Society of Nephrology (JASN), and Associate Editor for Experimental Results, Cambridge University Press. He has served on numerous IEEE/ACM program committees and is

peer-reviewer for more than a dozen journals. Dr. Saeed is the senior member of ACM and also the Senior Member of IEEE.

His honors include ThinkSwiss Fellowship (2007, 2008), NIH Postdoctoral Fellowship Award (2010), Fellows Award for Research Excellence (FARE) at NIH (2012), NSF CRII Award (2015), Outstanding New Researcher Award at WMU (2016), NSF CAREER Award (2017), WMU Distinguished Research and Creative Scholarship Award (2018), FIU KFSCIS Excellence in Applied Research Award (2020), and FIU Top Scholar Award (2022) for Research and Creative Activities.

**Current Research Interests:**

1. Computational Biology: Machine-learning modelling for Mass spectrometry based proteomics, proteogenomics, and meta-proteomics.
2. Neuroscience, and Neuroinformatics: Machine-learning methods for Functional magnetic resonance imaging or functional MRI (fMRI); Methods for diagnosis of Autism Spectrum, and Attention deficit hyperactivity disorder (ADHD); Methods for Early detection of Alzheimer's and related Dementia's; Mathematical modelling of default mode network for healthy brains
3. High performance Computing and Big Data: Methods for big data analysis (sampling, summarizing, reduction, compression methods), Communication avoiding memory-distributed algorithms, CPU-GPU, and CPU-FPGA based methods for scientific computations, System-on-chip for real-time processing of omics and medical data
4. Machine-Learning: Deep-learning networks, Convolutional neural network, Supervised and unsupervised clustering, distributed machine-learning models, and Cross Multimodality models, medical image analysis.
5. Graph Network Analysis: Graph network analysis, and graph convolutional networks for complex scientific problems

## 2 Summary of Credentials

- Published 90+ peer-reviewed research papers in leading proceedings, and journals, and 1 Book Chapter, and editor for 4 Conference Proceedings, and 3 special issue journals. 1 book (co-authored with PhD student Haseeb) was published by Springer, 150 pages in Summer 2022.
- Awarded over **US\$ 3.9 million** in external research funds - with more than **US\$ 2.7 million** as a PI. Out of this he has bought in **US\$ 2.1 million** to CEC and KFSCIS at FIU as a PI since Aug 2018. External fund raising, Intramural funds and computing allocations are not included in this amount. Most of the external research funds are competitively awarded from Federal Agencies such as National Science Foundation (NSF) and National Institutes of Health (NIH). The grants that he has acquired are some of the most highly competitive and prestigious federal grant in the US which includes NSF CRII award, NSF CAREER award and NIH R01 award. He has been awarded the NSF Research Initiation Initiative (CRII) Award and NSF Faculty Early Career Development (CAREER) Award which is NSF's most prestigious award in support of early-career faculty who have the potential to serve as academic role models in research and education. NIH R01 grant is the most sought after, oldest, and highly competitive grant mechanism at NIH, in the US and worldwide. This is a testament and an acknowledgement by his peers and federal agencies about highly competitive and cutting-edge leadership he is providing to the interdisciplinary field of machine-learning and computational biology.
- Inventor, 4 US Patents, 5 pending
- Senior Member IEEE, Senior Member ACM
- Delivered invited talks at conferences, workshop and academic departments including (**Distinguished invited talk**) at the 15th IEEE International Conference on Open Source Systems & Technologies (ICOSST 2021), and **Keynote Speech** at 14th International Conference on Bioinformatics and Computational Biology (BICOB), 2022
- His work has established a global profile as an Independent Researcher and leader in the field of which his remarkable funding stream is only a reflection of his stature. To this end, he has been sought as panelist at Early Career Reviewer (ECR) NIH, NSF, NIH NIDDK, National Nuclear Security Administration (NNSA) DOE, and as International expert and panelist for Croatian Science Foundation (CSF), University of Queensland Diamantina Institute in Australia, Belgium Fund for Scientific Research (F.R.S.–FNRS), Natural Sciences Engineering Research Council of Canada, and Wellcome Trust UK.
- 10+ open-source software projects including but not limited to machine-learning, parallel computing, big data proteomics, and neuroinformatics.
- Graduate 5 PhD students (2 more will defend in Spring 2023), and 3 MS students; most of them working in leading academic institutions and companies. Currently he is advising 2 postdocs, 8 PhD students, and, 3 undergraduate students. All of undergraduate/MS/PhD students have co-authored papers with him. His mentored PhD students have attained prominent positions such as permanent Staff Scientist at National Energy Research Scientific Computing Center (NERSC) at UC Berkeley, and as machine-learning scientist at German multinational company. Other notable students have accepted TT position at Kalamazoo College, Kennesaw State University (and then joined University of North Texas), and as senior lecturer at Ohio State University.
- Chaired or co-chaired 14+ conferences or workshops
- He was elected as Bioinformatics Associate Editor at Journal of the American Society of

Nephrology (JASN) since 2019. Note that JASN is a flagship number one ranked journal in the field of Nephrology, and only highly regarded researchers serve on its editorial board. In addition, he also serves as Associate Editor at Springer Journal of Network Modeling Analysis in Health Informatics and Bioinformatics, and have served as guest editor for Journal of Bioinformatics and Computational Biology (JBCB) for 4 years. Recently he was selected as Associate Editor for Experimental Results, Cambridge University Press.

- He has served as a peer-reviewed for more than a 3 dozen Journals including Nature Translational Psychiatry, Nature Methods, Oxford Bioinformatics, BMC Bioinformatics, Journal of the American Society of NEPHROLOGY, and IEEE Transactions on Parallel and Distributed Systems. Note that all of these are top journal in their respective fields. He has also served as a program committee member for more than dozen IEEE/ACM conferences.

### 3 Education and Professional Preparation

**National Institutes of Health (NIH)**

*Research Fellow*

Research Focus: Parallel algorithms for high-throughput proteomics & genomics

Bethesda, Maryland  
June 2011-January 2014

**National Institutes of Health (NIH)**

*Postdoctoral Fellow*

*Mentor:* Mark A. Knepper

Research Focus: High performance algorithms for high-throughput proteomics

Bethesda, Maryland  
August 2010-June 2011

**University of Illinois at Chicago (UIC)**

*Ph.D. Electrical & Computer Engineering*

*Advisor:* Ashfaq A. Khokhar

Research Focus: High performance algorithms for high-throughput(NGS) genomics

Dissertation: High performance computational biology algorithms

Chicago, IL  
Fall 2006-Summer 2010

**University of Engineering & Technology (UET)**

*B.Sc. Electrical Engineering*

*Advisor:* Shahid H. Bokhari

Lahore, Pakistan  
Jan 2002-Jan 2006

### 4 Experience

#### 4.1 Entrepreneurial Experience

- **AI-NeoTech LLC**

*Founder and CEO/CTO*

AI-NeoTech LLC develops advance computational infrastructure to diagnose, categorize, and predict mental disorders including but not limited Autism Spectrum Disorder (ASD), Attention deficit hyperactivity disorder (ADHD), and Alzheimer's and related dementia's (ADRD).

Miami, FL, USA  
August 2021 to date

#### 4.2 Research Experience

- **Florida International University (FIU)**

Knight Foundation School of Computing and Information Sciences (KFSCIS)

*Associate Professor with Tenure*

Biomolecular Sciences Institute (BSI)

*Associate Professor (courtesy)*

Department of Human and Molecular Genetics, Herbert Wertheim College of Medicine

*Associate Professor (courtesy)*

Independent and collaborative research with colleagues, students, visiting scholars, grant writing, graduate and undergraduate student supervision, teaching graduate and undergraduate classes.

Miami, FL, USA  
August 2018 to date

March 2021 to date

June 2021 to date

- **Western Michigan University (WMU)**

Department of Computer Science

Kalamazoo, MI, USA

- Adjunct Associate Professor (courtesy)* July 2019 to July 2020  
Independent and collaborative research with colleagues, and advising of PhD students.
- **Western Michigan University (WMU)** Kalamazoo, MI, USA  
Department of Electrical & Computer Engineering (50%) and  
Department of Computer Science (50%)  
*Associate Professor with Tenure* July 2018 to July 2019 (on leave)  
*Assistant Professor (Tenure-Track)* January 2014 to July 2018  
Independent and collaborative research with colleagues, students, visiting scholars, grant writing, graduate and undergraduate student supervision, teaching graduate and undergraduate classes.
  - **Center of HPC and Big Data at WMU** Kalamazoo, MI, USA  
*Founding Co-Director* October 2014 to July 2018  
A 1400 sq. ft. area was acquired from the university by a competitive proposal to set up a Hadoop cluster, high performance server, GPU's and, FPGA's. Independent and collaborative research with colleagues, students, visiting scholars, grant writing, graduate and undergraduate student supervision are some of the activities accomplished using the center.
  - **National Institutes of Health (NIH)** Bethesda, MD, USA  
*Visiting Scientist* January 2014 to August 2018  
Involved in various collaborative projects in systems biology, large-scale proteomics and genomics, grant writing and consultation for high-performance computing algorithms and infrastructure.
  - **National Institutes of Health (NIH)** Bethesda, MD, USA  
*Research Fellow* June 2011 to January 2014  
Independent and collaborative research with colleagues, students, visiting scholars, grant writing, graduate student supervision.
  - **National Institutes of Health (NIH)** Bethesda, MD, USA  
*Postdoctoral Fellow* August 2010 to June 2011  
Independent and collaborative research with colleagues, students, visiting scholars, graduate student supervision.
  - **University of Illinois at Chicago (UIC)** Chicago, IL , USA  
*Research Assistant* August 2006 to August 2010  
Included Ph.D. research, Ph.D. and Masters level coursework, aid in grant writing, reviewing, contributing numerous conference and journal papers.
  - **University of Illinois at Chicago (UIC)** Chicago, IL , USA  
*Research Graduate Assistant* August 2009 to August 2010  
Graduate assistant in Academic Computing and Communication Center at UIC. Responsibilities included maintaining websites for high traffic application, load-balancing webserver traffic and interactive scripts for academic and research applications
  - **Swiss Institute of Bioinformatics (SIB)** Basel, Switzerland  
*Visiting Scientist in Mihaela Zavolan Group* Summers 2009  
Proposed, designed and implemented a graph-theoretic framework for efficient computation of HMM based models for motif finding.

- **Swiss Federal Institute of Technology Zurich (ETH Zurich)** Basel, Switzerland  
*Visiting Scientist in Computational Biology Group (Niko Beerenwinkel)* Summers 2008  
 Designed a high performance multiple alignment algorithm for pyrosequencing reads of very large number. The algorithm was then used for viral population system of HIV haplotypes and resulted in more than 5 journal papers.
- **Space and Upper Atmosphere Research Commission** Lahore, Pakistan  
*Assistant Manager (Research)* Dec 2005 to August 2006  
 Analyzed the security vulnerability of organization wide computer networks. Designed and implemented a model for wireless communication incorporating different atmospheric conditions on memory-distributed clusters.
- **University of Engineering & Technology (UET)** Lahore, Pakistan  
*Undergraduate Research Assistant* Jan 2005 to Dec 2005  
 Introduced, designed and implemented an ad-hoc based wireless network in the computer communication laboratory which allowed the students to work in the same way as in the case of conventional (client/server) setup while eliminating single points of failure.

### 4.3 Teaching Experience

#### 4.3.1 Courses Developed and/or significantly revised

- **Florida International University (FIU)** Miami, FL, USA

  1. CDA 3102, Computer Architecture (undergraduate course)
  2. CAP 2752 Fundamentals of Data Science (undergraduate course)
  3. CIS 6930 HPC Algorithms for Scientific Applications (graduate course)
  4. COT 4431/COT 5432 Applied Parallel Computing  
(cross listed undergraduate/graduate course)
- **Western Michigan University (WMU)** Kalamazoo, MI, USA  
 CS6030/ECE6950, High Performance Architectures & Algorithms for Big Data

#### 4.3.2 Courses Taught

- **Florida International University (FIU)** Miami, FL, USA

COP 3337, Programming II	Spring 2023
CDA 3102, Computer Architecture	Fall 2022
COT 4431/COT 5432, Applied Parallel Computing	Fall 2022
COP 3337, Programming II	Spring 2022
CDA 3102, Computer Architecture	Fall 2021
COT 4431/COT 5432, Applied Parallel Computing	Fall 2021
COP 3337, Programming II	Spring 2021
COP 3337, Programming II	Fall 2020
COT 4431/COT 5432, Applied Parallel Computing	Fall 2020
COP 3337, Programming II	Spring 2020
COP 3337, Programming II	Fall 2019
CDA 3103, Fundamentals of Computer Systems	Spring 2019
CDA 3103, Fundamentals of Computer Systems	Fall 2018

- **Western Michigan University** Kalamazoo, MI, USA
  - CS 4310, Design & Analysis of Algorithms Spring 2018
  - ECE 2510, Introduction to Microprocessors Fall 2017
  - ECE 2510, Introduction to Microprocessors Spring 2017
  - CS6030/ECE6950, High Performance Architectures & Algorithms for Big Data Spring 2017
  - ECE 2510, Introduction to Microprocessors Fall 2016
  - CS 4310, Design & Analysis of Algorithms Spring 2016
  - ECE 2510, Introduction to Microprocessors Fall 2015
  - CS6030/ECE6950, High Performance Architectures & Algorithms for Big Data Spring 2015
  - ECE 2510, Introduction to Microprocessors Fall 2014
  - ECE/CS 7250, Doctoral Research Seminar Spring 2014
- **National Institutes of Health (NIH)** Bethesda, MD, USA
  - Instructor for Community College Summer Enrichment Program (CCSEP) Summer 2012
- **University of Illinois at Chicago (UIC)** Chicago, IL, USA
  - Instructor for Digital Communications Course (ECE 432) Fall 2007
  - Teaching Assistant for Electric Circuit Analysis Lab (ECE 225) Spring 2007

#### 4.3.3 Courses Certifications

- Quality Matters (QM) Certification for COP 3337, Programming II Fall 2020

## 5 [Honors and Awards](#)

1. **FIU Top Scholar** (For Research and Creative Activities), 2022
2. Expert Panelist for: Center for Scientific Review (CSR), National Institutes of Health (NIH) for the following study sections: Clinical Data Management and Analysis (CDMA), NCI Transnational and Basic Research Early Lesions (U54 and U24), NCI Clinical Proteomic Tumor Analysis Consortium (CPTAC), Biodata Management and Analysis (BDMA), National Institute of Neurological Diseases and Stroke NST-2, and NIH Bridge to Artificial Intelligence (Bridge2AI).
3. **International Expert Panelist** for: Natural Sciences and Engineering Research Council (NESRC) of Canada, Belgium Fund for Scientific Research (F.R.S.– FNRS), Lahore University of Management Sciences (LUMS), The Croatian Science Foundation (HRZZ), and Wellcome Trust United Kingdom (UK).
4. **Associate Editor**, Experimental Results, Cambridge University Press, April 2022
5. **Keynote Speaker** at the 14th International Conference on Bioinformatics and Computational Biology (BICOB), Feb 2022
6. **Excellence in Applied Research Award**, School of Computing and Information Science (SCIS), Florida International University (FIU), Dec 2020
7. Distinguished Research and Creative Scholarship Award, Office of Vice President of Research WMU, Feb 2018
8. **NSF CAREER Award**, 2017-2022
9. Highest Funding Award in a year for computer scientist, WMU 2017
10. **ACM Senior Member**, May 2017
11. **Outstanding New Researcher Award**, College of Engineering and Applied Science (CEAS), Western Michigan University, Jan 2016 (1 faculty member gets the award in a single year for the entire college consisting of 7 academic departments)

12. **IEEE Senior Member**, March 2015
13. **NSF CISE Research Initiation Initiative (CRII) Award**, Feb 2015 - Feb 2018
14. Fellows Award for Research Excellence (FARE), National Institutes of Health (NIH), June 2012 (Official award ceremony and US\$1000 travel grant)
15. Nominated for NHLBI DIR Orloff Science Awards NIH, Jan 2012.
16. Postdoctoral Fellowship Award, National Institutes of Health (NIH), 2010-2011.
17. Nominated for the Best Dissertation Award of the year 2010 by ECE Department at UIC (One dissertation is nominated per year).
18. Tuition & Fee Waiver Award from Electrical and Computer Engineering Department, University of Illinois at Chicago, Summers 2010.
19. Recipient of full tuition fellowship and research assistantship by the Department of Electrical & Computer Engineering, University of Illinois at Chicago during doctoral studies.
20. Travel award from Swiss Institute of Bioinformatics (SIB), Summers 2009.
21. UIC Graduate Student Council (GSC) travel award for the BiCoB April 2009.
22. Recipient of Think Swiss Scholarship, by the Government of Switzerland for two years (2007 and 2008).
23. Travel award from D-BSSE ETH Zurich, Summers 2008.
24. Higher Education Commission Scholarship by Government of Pakistan in 2007 ( $\frac{13}{800} = 1.63\%$  acceptance rate in engineering discipline).
25. Satellite Research and Development Center Space and Upper Atmosphere Research Commission Pakistan (SUPARCO) in 2006 for PhD studies.

## 6 Research Funding

Since 2015 I have been awarded over **US\$ 3.9 million** in external research funds - with more than **US\$ 2.7 million** as a PI. Out of this I have bought in **US\$ 2.1 million** to CEC and KFSCIS at FIU as a PI since Aug 2018. External fund raising (**US\$ 10 Million + US\$ 6 Million**), Intramural funds (**US\$ 895,107**) and computing allocations are not included in this amount.

### 6.1 Funded External Grants

1. **National Science Foundation (NSF) CHE-2304837 [US\$ 500,000]**, "Development of Multidimensional Ion Mobility-Tandem Mass Spectrometry (IMS<sub>n</sub>-FT-ICR MS<sub>n</sub>) Tools for the Characterization of Complex Mixtures", Francisco Fernandez-Lima(PI), **Fahad Saeed (Co-PI)**, Sept 2023 - August 2026
2. **National Science Foundation (NSF) TI-2213951 [US\$ 250,000]**, "PFI-TT: Artificial Intelligence-enabled Real-time System for Early Epileptic Seizure Detection and Prediction", **Fahad Saeed (PI)**, August 1, 2022 - July 31 2024
3. **National Science Foundation (NSF) IIP-2143515 [US\$ 50,000]**, "I-Corps: Utilizing Machine learning and Artificial Intelligence (AI) for Early Detection and Identification of Mental Disorders", **Fahad Saeed (PI)**, Sept 2021 - Sept 2023
4. **National Science Foundation (NSF) OAC-1925960 [US\$ 415,590]**, "CAREER: Towards Fast and Scalable Algorithms for Big Proteogenomics Data Analytics", **Fahad Saeed (PI)**, Sept 2018 - August 2023
5. **National Science Foundation (NSF) OAC-2126253 [US\$ 400,000]**, "CC\* Compute: RAPTOR - Reconfigurable Advanced Platform for Transdisciplinary Open Research", Jason Liu (PI), Jayantha Obeysekera (Co-PI), Keqi Zhang (Co-PI), Cassian D'Cunha (Co-PI), Mike Kirgan

- (SI), Yuepeng Li (SI), Vasilka Chergarova (SI), Yagya Joshi (SI), Jonathan Casco (SI), and **Fahad Saeed (Co-PI)**, Sept 2021 - Sept 2023
6. **National Institutes of Health (NIH) Supplemental- 3R01GM134384-02S1 [US\$ 100,000]**, “Compute-Cluster for Deep-Learning Models for Mass Spectrometry based Proteomics data”, **Fahad Saeed (PI)**, August 2021 - May 2024
  7. **National Institutes of Health (NIH) Supplemental- 3R01GM134384-01A1S1 [US\$ 205,291]**, “Multimodal Machine-Learning Algorithms for Early Detection, and Classification for Alzheimer Disorder and Related Dementia’s”, **Fahad Saeed (PI)**, May 2021 - May 2024
  8. **National Institutes of Health (NIH) R01GM134384 [US\$ 965,874]**, “Multimodal Machine-Learning and High Performance Computing Strategies for Big MS Proteomics Data”, **Fahad Saeed (PI)** with Shu-Ching Chen (Co-Investigator), Jason Liu (Co-Investigator), Francisco Alberto Fernandez-Lima (Co-Investigator), and Sitharama Iyengar (Senior Personal), June 2020 - June 2024
  9. **National Science Foundation (NSF) CCF-1855441 [US\$ 7,708]**, “CRII: SHF: HPC Solutions to Big NGS Data Compression”, **Fahad Saeed (PI)**, Sept 2018 - Jan 31, 2020
  10. **National Science Foundation (NSF) ACI-1651724 [US\$ 499,999]**, “CAREER: Towards Fast and Scalable Algorithms for Big Proteogenomics Data Analytics”, **Fahad Saeed (PI)**, April 2017-April 2022
  11. **National Institutes of Health (NIH) R15GM120820 [US\$ 418,533]**, “Parallel Algorithms for Big Data from Mass Spectrometry based Proteomics”, **Fahad Saeed (PI)**, April 2017 - April 2020
  12. **National Science Foundation (NSF) REU Supplement [US\$ 16,000]**, “CRII: SHF: HPC Solutions to Big NGS Data Compression”, **Fahad Saeed (PI)**, Feb 2016 - Feb 2018
  13. **National Science Foundation (NSF) CCF-1464268 [US\$ 171,341]**, “CRII: SHF: HPC Solutions to Big NGS Data Compression”, **Fahad Saeed (PI)**, (Feb 2015 - Feb 2018)
  14. **National Science Foundation (NSF) CNS-1250264 [US\$ 200,000]**, “EAGER: High Performance Algorithms and Implementations for Biological Sequence Analysis and Genome Alignment”, Ashfaq Khokhar, **Fahad Saeed (Co-PI)** (Sept 2012 - Aug 2015)

## 6.2 Funded Equipment/Computing Allocations

1. **Xilinx [US\$ 13,195]**, “Design and development of FPGA based MS omics pipeline”, **Fahad Saeed(PI)** (Equipment Grant, Versal AI Core EK-VCK190-G FPGA), March 2022
2. **NSF XSEDE Extended Collaborative Support Service (ECSS) [US\$ 50,000]**, “DeepSNAP: Scalable Machine Learning for Mass Spectrometry based Proteomics”, **Fahad Saeed (PI)**, (Jan 2021 - Dec 2021)
3. **National Science Foundation XSEDE ASC200004 [125,000.0 Service Units (SU)/10,000.0 GB SDSC Medium-term disk storage (Data Oasis)/10,000.0 GPU Hours/75,000 Core hours on Clusters: US\$ 43,161.42]**, “DeepSNAP: Scalable Machine Learning for Mass Spectrometry based Proteomics”, **Fahad Saeed (PI)**, (Jan 2021 - Dec 2021)
4. **National Science Foundation XSEDE ASC200004 [100,000.0 Service Units (SU)/10,000.0 GB SDSC Medium-term disk storage (Data Oasis)/5,000.0 GPU Hours: US\$ 6,190]**, “Deep-SNAP: Scalable Machine Learning for Mass Spectrometry based Proteomics”, **Fahad Saeed (PI)**, (March 2020 - Jan 2021)
5. **Intel Altera [US\$ 7,900]**, “MS proteomics analysis using reconfigurable hardware”, **Fahad Saeed(PI)** (Equipment Grant, DE10-PRO-SX FPGA), Nov 2019
6. **National Science Foundation XSEDE supplemental grant TG-CCR150017 [30,000 Service Units (SU)/6TB SDSC Disk Storage/2500 GPU Hours: US\$ 450]**, “Smart Index and Search

for De Novo Proteogenomics”, **Fahad Saeed (PI)**, (March 2019 - June 2020)

7. **National Science Foundation XSEDE renewal grant TG-CCR150017 [30,000 Service Units (SU)/6TB SDSC Disk Storage/2500 GPU Hours: US\$ 3,159]**, “Smart Index and Search for De Novo Proteogenomics”, **Fahad Saeed (PI)**, (March 2019 - March 2020)
8. **NVIDIA [US\$ 1149]**, “High Performance Algorithms for Big Data Proteomics”, **Fahad Saeed (PI)** (Equipment Grant for NVIDIA TITAN Xp GPU), August 2018
9. **National Science Foundation XSEDE renewal grant TG-CCR150017 [30,000 Service Units (SU)/6TB SDSC Disk Storage: US\$ 6564]**, “A Distributed-Shared Memory Strategy to Speedup the Compression of Big Next-Generation Sequencing Datasets”, **Fahad Saeed (PI)**, (June 2016 - June 2018)
10. **National Science Foundation XSEDE startup grant TG-CCR150017 [30,000 Service Units (SU)]**, “Scalability study of compression algorithms for peta scale NGS data”, **Fahad Saeed (PI)**, (June 2015 - June 2016)
11. **Intel Altera [US\$ 16,000]**, “Short Reads mapping to the genome using reconfigurable hardware”, **Fahad Saeed(PI)** (Equipment Grant, 2 DE5-NET-450 FPGA’s), April 2014
12. **NVIDIA [US\$ 5499]**, “High Performance Algorithms for Genome Alignments”, **Fahad Saeed (PI)** (Equipment Grant for Tesla K40 GPU), Feb 2014

### 6.3 Funded Intramural Grants

1. **University of Florida ORED/BOG [US\$ 50,000]**, “Scalable Algorithms for Big MS data using CPU-GPU architectures”, **Fahad Saeed (PI)**, October 18, 2021 - April 18th, 2022,
2. **Office of Vice President of Research, Florida International University (FIU) [US\$ 435,281]**, “Scalable Algorithms for Big Omics Data”, **Fahad Saeed (PI)**, Sept 2018 - April 2022
3. **Office of Vice President of Research, Western Michigan University (WMU) [US\$ 129,570]**, “Scalable Algorithms for Big Proteogenomics Data Analytics”, **Fahad Saeed (PI)**, April 2017 - April 2020
4. **College and Engineering and Applied Science (CEAS), Western Michigan University (WMU) [US\$ 41,650]**, “Developing HPC solutions to big fMRI data”, **Fahad Saeed (PI)**, April 2017 - June 2018
5. **Department of Computer Science, Western Michigan University (WMU) [US\$ 238,606]**, “High performance computing for Computational Biology”, **Fahad Saeed (PI)**, Jan 2014 - June 2018

### 6.4 External Fund Raising

1. Nicolai Kosche Professor of Computer Science at Western Michigan University - Spear-headed the proposal writing and execution of Bioinformatics, and Machine-learning models for Personalized Medicine Center which resulted in chaired faculty positions in department of biology, medicine, and computer science - Total **US\$ 6 Million** - 2020 (bequest)
2. FIU Knight Foundation Grant- Collaborative proposal writing with SS Iyengar, Robert Lipman, Mark Finlayson, Joselyn Naranjo, Scott Graham, Jason Liu and John Volakis - Resulted in renaming of school to **Knight School of Computing and Information Sciences** - Total **US\$ 10 Million** to the School of Computing, and **US\$ 106 Million** to the FIU - 2021

### 6.5 Pending

1. **National Institutes of Health (NIH) [US\$ 1,212,383]**, “Self-learning Machine-Learning models for classification and characterization of Autism Spectrum Disorder using MRI data”,

- Fahad Saeed (PI)**, July 2023
2. **National Institutes of Health (NIH)** [US\$ 2,248,947], "Machine-Learning Models for big data omics", **Fahad Saeed (PI)**, May 2023
  3. **National Institutes of Health (NIH)** [US\$ 300,000], "SBIR phase I: Continuous monitoring of epileptic seizures", **Fahad Saeed (Co-I)**, Mohammad Umair (Co-PI), Saba Mehmood (PI), March 2023
  4. **National Institutes of Health (NIH)** [US\$ 2,784,653], "Generalizable machine learning models for early prediction of Alzheimers disease in diverse demographic populations", **Fahad Saeed (PI)**, Serdar Bozdog (Co-PI), Angela Laird (Co-I), March 2023
  5. **National Science Foundation (NSF)** [US\$ 275,000], "SBIR Phase I: Epileptic Seizure Prediction using EEG Data ", Saba Mehmood (PI), **Fahad Saeed (Senior Personal)**, March 2023
  6. **National Science Foundation (NSF)** [US\$ 600,000], "OAC Core: High Performance Computing Algorithms and Software for large-scale Mass Spectrometry based Omics", **Fahad Saeed (PI)**, Francisco Lima (co-PI), Dec 2022
  7. **National Science Foundation (NSF)** [US\$ 946,510], "Development of multidimensional IMSn-FT-ICR MSn tools for the characterization of complex mixtures", **Fahad Saeed (Co-PI)**, Francisco Lima (PI), Oct 2022

## 7 Publications and Creative Scholarship

† Indicates Corresponding and/or Senior Author.

Impact factor, and conference acceptance rate is listed, if available.

### 7.1 Books

1. Muhammad Haseeb, and **Fahad Saeed**<sup>†</sup>, "High Performance Computing for Big Mass Spectrometry Data based omics", ISBN: 978-3-031-01959-3, Hardcover Edition, *Springer*, Sept 2022 (140 pages)

### 7.2 Book Chapters

1. Usman Tariq, Samuel Ebert, and **Fahad Saeed**<sup>†</sup>, "Making MS omics data ML ready: SpeColate Protocols", Submitted Methods in Molecular Biology published by Springer Nature, August 2023
2. Taban Eslami, Joe Raiker, and **Fahad Saeed**<sup>†</sup>, "Explainable and Scalable Machine-Learning Algorithms For Detection of Autism Spectrum Disorder using fMRI Data", *Elsevier Neural Engineering Techniques for Autism Spectrum Disorder Volume 1: Imaging and Signal Analysis*, Pages 39-54 (Chapter 4), 2021

### 7.3 Edited Conference Proceedings

1. Proceedings of 7th International Conference on Bioinformatics and Computational Biology (BICoB), with Hisham Al-Mubaid and Nurit Haspel, (ISBN: 9781510800137) March 2015
2. Proceedings of 6th International Conference on Bioinformatics and Computational Biology (BICoB), with Bhaskar Dasgupta, Hisham Al-Mubaid and Nurit Haspel (ISBN: 9781632665140) March 2014

3. Proceedings of 5th International Conference on Bioinformatics and Computational Biology (BICoB), with Bhaskar Dasgupta, Hisham Al-Mubaid and Reda Al-Hajj (ISBN: 978-1-880843-89-5), March 2013
4. Proceedings of 4th International Conference on Bioinformatics and Computational Biology (BICoB), with Hisham Al-Mubaid and Ashfaq Khokhar (ISBN: 978-1-880843-85-7), March 2012

#### 7.4 Edited Special Issue of Journals

1. Special issue on selected papers from the 4th IEEE HPC-BOD workshop, with Serdar Bozdag in the *Frontiers of Bioinformatics*, Vol. xx. No. xx, 2023
2. Special issue on selected papers from the 3th IEEE HPC-BOD workshop, with Serdar Bozdag in the *PLoS One*, 2022 (due to small number of papers - the selected manuscripts were published as regular papers).
3. Special issue on selected papers from the 7th international conference on bioinformatics and computational biology (BICoB 2015) with Nurit Haspel and Hisham Al-Mubaid in the *Journal of Bioinformatics and Computational Biology (JBCB)* Vol. 14, No. 3. March 2016
4. Special issue on selected papers from the 6th international conference on bioinformatics and computational biology (BICoB 2014) with Bhaskar Dasgupta, Nurit Haspel and Hisham Al-Mubaid in the *Journal of Bioinformatics and Computational Biology (JBCB)* Volume 12, Issue 05, October 2014
5. Special issue on selected papers from the 5th international conference on bioinformatics and computational biology (BICoB 2013) with Bhaskar Dasgupta and Hisham Al-Mubaid, *Journal of Bioinformatics and Computational Biology (JBCB)* Volume 11, Issue 05, October 2013

#### 7.5 Peer-Reviewed Journal Publications

1. Mohammad Al Olaimat, Jared Martinez, **Fahad Saeed**, Serdar Bozdag, "PPAD: A deep learning architecture to predict progression of Alzheimer's disease", *Oxford Bioinformatics*, Volume 39, Issue Supplement 1, June 2023, Pages i149–i157, <https://doi.org/10.1093/bioinformatics/btad249>, June 2023 (**Impact Factor: 5.8**)
2. Oswaldo Artiles, Zeina Al Masry, and **Fahad Saeed**<sup>†</sup>, "Confounding effects on the performance of machine learning analysis of static functional connectivity computed from rs-fMRI multi-site data", *Springer Neuroinformatics*, June 2023 (**Impact Factor: 4.0**)
3. Leyva, Dennys, Usman Tariq, Muhammad, Jaffe, Rudolf, **Fahad Saeed**, Francisco Fernández-Lima, "Description of Dissolved Organic Matter transformational networks at the molecular level", *ACS Journal of Environmental Science & Technology*, Jan 2023 (**Impact Factor: 11.4**)
4. Dennys Leyva, Rudolf Jaffé, Jessica Courson, John S. Kominoski, Muhammad Usman Tariq, **Fahad Saeed**, and Francisco Fernandez-Lima, "Molecular level characterization of DOM along a freshwater-to-estuarine coastal gradient in the Florida Everglades", *Springer Aquatic Sciences*, volume 84, Article number: 63, Sept 2022 (**Impact Factor: 2.8**)
5. Mohammed Aledhari, Rehma Razzak, Basheer Qolomany, Ala Al-Fuqaha, and **Fahad Saeed**<sup>†</sup>, "Biomedical IoT: Enabling Technologies, Architectural Elements, Challenges, and Future Directions", *IEEE Access*, March 2022 (**Impact Factor: 3.4**)
6. Dennys Leyva, Muhammad Usman Tariq, Rudolf Jaffe, **Fahad Saeed**, and Francisco Fernández-Lima, "Unsupervised Structural Classification of Dissolved Organic Matter based on fragmentation pathways", *ACS Journal of Environmental Science & Technology*, Vol 56 (2), pp 1458-1468, Jan 2022 (**Impact Factor: 9.1**)

7. **Fahad Saeed**<sup>†</sup>, Muhammad Haseeb, and SS Iyengar, “Communication lower-bounds for distributed-memory computations for mass spectrometry-based omics data”, *Journal of Parallel and Distributed Computing (JPDC)*, Volume 161, Pages 37-47, March 2022 (**Impact Factor: 3.7**)
8. Usman Tariq, and **Fahad Saeed**<sup>†</sup>, “SpeCollate: Deep cross-modal similarity network for mass spectrometry data based peptide deductions”, *PLoS ONE*, Vol. 16, Issue 10, Oct 2021 (**Impact Factor: 3.24**)
9. Muhammad Haseeb, and **Fahad Saeed**<sup>†</sup>, “High performance computing framework for tera-scale database search of mass spectrometry data”, *Nature Computational Science*, Vol. 1, Issue 8, p. 550–561, August 2021
10. Fahad Almuqhim, and **Fahad Saeed**<sup>†</sup>, “ASD-SAENet: Sparse Autoencoder for detecting Autism Spectrum Disorder (ASD) using fMRI data”, *Frontiers in Computational Neuroscience*, Vol. 15, p. 27, March 2021 (**Impact Factor: 3.4**)
11. Muaaz Awan, and **Fahad Saeed**<sup>†</sup>, “Benchmarking Mass Spectrometry based Proteomics Algorithms using a Simulated Database”, *Springer Network Modeling Analysis in Health Informatics and Bioinformatics*, Vol. 10, Article 23, March 2021 (**Impact Factor: 2.3**)
12. Taban Eslami, Fahad Almuqhim, Joseph S Raiker, **Fahad Saeed**<sup>†</sup>, “Machine Learning methods for diagnosing Autism Spectrum Disorder, and Attention-deficit/Hyperactivity Disorder using functional and structural MRI: A Survey”, *Frontiers in Neuroinformatics*, Vol. 14, pp. 62, Jan 2021 (**Impact Factor: 2.7**)
13. Usman Tariq, Muhammad Haseeb, Mohammed Aledhari, Rehma Razzak, Reza Parizi, and **Fahad Saeed**<sup>†</sup>, “Methods for Proteogenomics Data Analysis, Challenges, and Scalability Bottlenecks: A Survey”, Vol. 9, pages: 5497-5516, *IEEE Access*<sup>1</sup>, Jan 2021 (**Impact Factor: 4.1**)
14. Bronte Wen, Hyun Jun Jung, Lihe Chen, **Fahad Saeed**, and Mark Knepper, “NGS-Integrator: An efficient tool for combining multiple NGS data tracks using minimum Bayes’ factors”, *BMC Genomics*, vol. 21, No. 1, pp-1-7, Nov 2020 (**Impact Factor: 4.09**)
15. Mohammed Aledhari, Rehma Razzak, Reza Parizi, and **Fahad Saeed**<sup>†</sup>, “Federated Learning: A Survey on Enabling Technologies, Protocols, and Applications”, *IEEE Access*, Vol. 8, pp. 140699–140725, July 2020 (**Impact Factor: 4.1**)
16. Taban Eslami, Vahid Mirjalili, Alvis Fong, Angela Laird, and **Fahad Saeed**<sup>†</sup>, “ASD-DiagNet: A hybrid learning approach for detection of Autism Spectrum Disorder using fMRI data”, *Frontiers In Neuroinformatics*, Vol 13, Pages 70, Nov 2019 (**Impact Factor: 3.8**) (**Best Paper Editor’s Pick 2021 - one of 23 papers selected from over 700 papers**)<sup>2</sup>
17. Muaaz Awan, and **Fahad Saeed**<sup>†</sup>, “MaSS-Simulator: A highly configurable simulator for generating MS/MS datasets for benchmarking of proteomics algorithms”, *Wiley PROTEOMICS*,<sup>3</sup>, Volume 18, Issue 20, October 2018 (**Impact Factor: 4.1**)
18. Muaaz Awan, Taban Eslami, and **Fahad Saeed**<sup>†</sup>, “GPU-DAEMON: GPU Algorithm Design, Data Management & Optimization template for array based big omics data”, *Elsevier Computers in Biology and Medicine*, Volume 101, pp. 163-173, October 2018 (**Impact Factor: 2.2**)
19. **Fahad Saeed**<sup>†</sup>, “Towards quantifying psychiatric diagnosis using machine learning algorithms and big fMRI data”, *BMC Big Data Analytics*, Vol. 3, No. 1, pp. 1-7, May 2018

<sup>1</sup>IEEE Access is ranked as one of the top 3 peer-reviewed journal in its respective sub-category [https://scholar.google.com/citations?view\\_op=top\\_venues&hl=en&vq=eng\\_enggeneral](https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=eng_enggeneral)

<sup>2</sup>Editor citation reads: *This collection showcases well-received spontaneous articles from the past 2 years. All research presented demonstrates strong advances in theory, experiment and methodology with applications to compelling problems. This collection aims to recognize highly deserving authors.*

<sup>3</sup>Wiley Proteomics is one of the top 5 peer-reviewed journal in its respective sub-category [https://scholar.google.com/citations?view\\_op=top\\_venues&hl=en&vq=bio\\_proteomicspeptides](https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=bio_proteomicspeptides)

20. Taban Eslami, and **Fahad Saeed**<sup>†</sup>, “Fast-GPU-PCC: A GPU-Based Technique to Compute Pairwise Pearson’s Correlation Coefficients for Time Series Data - An fMRI Study”, *MDPI High-Throughput*, Vol. 7, No. 2, article 11, April 2018
21. Mohammed Aledhari, Marianne E Di Pierro, Mohamed Hefeida, and **Fahad Saeed**<sup>†</sup>, “A Deep Learning-Based Data Minimization Algorithm for Fast and Secure Transfer of Big Genomic Datasets”, *IEEE Transactions on Big Data*, Feb 2018 (**Impact Factor: 7.2**)
22. Sandino N. Vargas-Pérez and **Fahad Saeed**<sup>†</sup>, “A Hybrid MPI-OpenMP Strategy to Speedup the Compression of Big Next-Generation Sequencing Datasets”, *IEEE Transactions on Parallel and Distributed Systems*<sup>4</sup>, vol. 28, no. 10, pp. 2760-2769, Oct. 1 2017 (**Impact Factor: 4.2**)
23. Pablo C. Sandoval, J’Neka S. Claxton, Jae Wook Lee, **Fahad Saeed**, Jason D. Hoffert and Mark A. Knepper, “Systems-level analysis reveals selective regulation of Aqp2 gene expression by vasopressin”, *Nature Scientific Reports*, Vol. 6, article number 34863, October 2016 (**Impact Factor: 5.6**)
24. Muaaz Gul Awan and **Fahad Saeed**<sup>†</sup>, “MS-REDUCE: An ultrafast technique for reduction of Big Mass Spectrometry Data for high-throughput processing”, *Oxford Bioinformatics*<sup>5</sup>, Vol. 32, No. 10, pages 1518-1526, Jan 2016 (**Impact Factor: 7.3**)
25. Sookkasem Khositseth, Panapat Uawithya, Poorichaya Somparn, Komgrid Charngkaew, Nattakan Thippamom, Jason D. Hoffert, **Fahad Saeed**, D. Michael Payne, Shu Hui Chen, Robert A. Fenton and Trairak Pisitkun, “Autophagic degradation of aquaporin-2 is an early event in hypokalemia-induced nephrogenic diabetes insipidus”, *Nature Scientific Reports*, Vol. 5, article number 18311 Dec 2015 (**Impact Factor: 5.6**)
26. Akshay Sanghi, Matthew Zaringhalam, Callan Corcoran, **Fahad Saeed**, Jason Hoffert, Pablo Sandoval, Trairak Pisitkun, and Mark Knepper, “A Knowledge Base of Vasopressin Actions in Kidney”, *American Journal of Physiology (AJP)*, Vol. 307, No. 6, pages F747–F755, July 2014 (**Impact Factor: 7.6**)
27. **Fahad Saeed**<sup>†</sup>, Jason Hoffert, Trairak Pisitkun and Mark Knepper, “Exploiting Thread-Level and Instruction-Level Parallelism to Cluster Mass Spectrometry Data using Multicore Architectures”, *Springer Journal of Network Modeling Analysis in Health Informatics and Bioinformatics*, Volume 3, No. 1, pages 1-19, April 2014 (**Impact Factor: 2.3**)
28. **Fahad Saeed**<sup>†</sup>, Jason Hoffert and Mark Knepper, “CAMS-RS: Clustering Algorithm for Large-Scale Mass Spectrometry Data using Restricted Search Space and Intelligent Sampling”, *Computational Biology and Bioinformatics, IEEE/ACM Transactions on*, vol.11, no.1, pp.128-141, Feb. 2014 (**Impact Factor: 1.4**)
29. Jason Hoffert, Trairak Pisitkun, **Fahad Saeed**, Justin Wilson, and Mark Knepper, “Global Analysis of the Effects of the V2 Receptor Antagonist Satavaptan on Protein Phosphorylation in Collecting Duct”, *American Journal of Physiology (AJP)*, Vol. 306, No. 410-421 February 2014 (**Impact Factor: 7.6**)
30. **Fahad Saeed**<sup>†</sup>, Trairak Pisitkun, Jason D. Hoffert, Sara Rashidian, Guanghui Wang, Marjan Gucek, and Mark A. Knepper, “PhosSA: Fast and Accurate Phosphorylation Site Assignment Algorithm for Mass Spectrometry Data”, *Proteome Science* Volume 11, Supplement 1, November 2013 (**Impact Factor: 2.4**)
31. Pablo C. Sandoval, Dane H. Slentz, Trairak Pisitkun, **Fahad Saeed**, Jason D. Hoffert and Mark A. Knepper, “Proteome-wide measurement of protein half-lives and translation rates

<sup>4</sup>IEEE Transactions on Parallel and Distributed Systems is considered *the top* (highest ranked) peer-reviewed journal in its respective sub-category [https://scholar.google.com/citations?view\\_op=top\\_venues&hl=en&vq=eng\\_computingsystems](https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=eng_computingsystems)

<sup>5</sup>Oxford Bioinformatics is considered *the top* (highest ranked) peer-reviewed journal in its respective sub-category [https://scholar.google.com/citations?view\\_op=top\\_venues&hl=en&vq=eng\\_bioinformatics](https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=eng_bioinformatics)

- in vasopressin-sensitive collecting duct cells”, *Journal of the American Society of Nephrology (JASN)*, Volume 24, Issue 11, pages 1793-1805, March 2013 (**Impact Factor: 9.3**)
32. Boyang Zhao, Trairak Pisitkun, Jason D. Hoffert, Mark A. Knepper, and **Fahad Saeed**<sup>†</sup>, “CPhos: a program to calculate and visualize evolutionary conserved functional phosphorylation sites”, *PROTEOMICS*, Vol. 12, No. 22, pages 3299-3303, October 2012 (**Impact Factor: 3.8**)
  33. Steven Bolger, Patricia Gonzales Hurtado, Jason Hoffert, **Fahad Saeed**, Trairak Pisitkun, and Mark Knepper, “Quantitative Phosphoproteomics in Nuclei of Vasopressin-Sensitive Renal Collecting Duct Cells”, *American Journal of Physiology (AJP)*, Vol. 303, No. 10, pages C1006-C1020, Sept. 2012 (**Impact Factor: 7.6**)
  34. Jacqueline Douglass, Ruwan Gunaratne, Davis Bradford, **Fahad Saeed**, Jason D. Hoffert, Peter J. Steinbach, Mark A. Knepper, and Trairak Pisitkun, “Identifying Protein Kinase Target Preferences Using Mass Spectrometry”, *American Journal of Physiology (AJP)*, Vol. 303, No. 7, pages C715-C727, June 2012 (**Impact Factor: 7.6**)
  35. **Fahad Saeed**, Alan Perez-Rathke, Jaroslaw Gwarnicki, Tanya Berger-Wolf, Ashfaq Khokhar, “A high performance multiple sequence alignment system for pyrosequencing reads from multiple reference genomes”, *Journal of Parallel and Distributed Computing (JPDC)*, Volume 72, Issue 1, pages 83-93, January 2012 (**Impact Factor: 1.2**)
  36. Jason D. Hoffert, Trairak Pisitkun, **Fahad Saeed**, Jae Song and Mark A. Knepper, “Dynamics of the vasopressin V2 receptor signalling network revealed by quantitative phosphoproteomics” *Molecular & Cellular Proteomics (MCP)*<sup>6</sup>, Vol. 11, Issue No. 2, Feb 2012 (**Impact Factor: 6.9**)
  37. Trairak Pisitkun, Jason D. Hoffert, **Fahad Saeed** and Mark Knepper, “NHLBI-AbDesigner: An online tool for design of peptide-directed antibodies”, *American Journal of Physiology (AJP)*, Vol. 302, pages C154-C164, Jan 2012 (**Impact Factor: 7.6**)
  38. **Fahad Saeed**, Ashfaq Khokhar, “A domain decomposition strategy for alignment of multiple biological sequences on multiprocessor platforms”, *Journal of Parallel and Distributed Computing (JPDC)* Vol 69, Issue 7, pages 666-677, July 2009 (**Impact Factor: 1.2**)
  39. **Fahad Saeed**, Ashfaq Khokhar, Osvaldo Zagordi and Niko Beerenwinkel, “Multiple Sequence Alignment System for Pyrosequencing Reads” *Lecture Notes in Computer Science (LNCS)*, Volume 5462/2009, pp 362-375, 2009. (**Impact Factor: 0.5**)

## 7.6 Peer-Reviewed Conference Proceedings

40. Tianren Yang, Mai Al-Duailij, Serdar Bozdog, and **Fahad Saeed**<sup>†</sup>, “Classification of Autism Spectrum Disorder using Graph Convolutional Network and Graphlet Counting”, 2nd International Workshop on Multi-Modal Medical Data Analysis, Proceedings of *IEEE International Conference on Big Data (IEEE BigData 2022)*, Osaka Japan, Dec 17-20 2022.
41. Muhammad Umair and **Fahad Saeed**<sup>†</sup>, “SPERTL: Epileptic Seizure Prediction using EEG with ResNets and Transfer Learning”, Proceedings of *IEEE International Conference on Biomedical and Health Informatics (BHI)*, Ioannina Greece, 27-30 September 2022.
42. Oswaldo Artiles and **Fahad Saeed**<sup>†</sup>, “A Multi-Factorial Assessment of Functional Human Autistic Spectrum Brain Network Analysis”, International workshop on Reproducibility and Robustness in Biological Data Analysis (RROBIN), Proceedings of *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, December 9-12, 2021

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<sup>6</sup>Molecular & Cellular Proteomics (MCP) is considered *the* top (highest ranked) peer-reviewed journal in its respective sub-category [https://scholar.google.com/citations?view\\_op=top\\_venues&hl=en&vq=bio\\_proteomicspeptides](https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=bio_proteomicspeptides)

43. Khandaker Mamun Ahmed, Taban Eslami, **Fahad Saeed**<sup>†</sup>, and M. Hadi Amini, “Deep-COVIDNet: Deep Convolutional Neural Network for COVID-19 Detection from Chest Radiographic Images”, International workshop on Machine Learning for Biological and Medical Image Big Data, Proceedings of *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, December 9-12, 2021
44. Muhammad Usman Tariq, Dennys Leyva, Francisco Fernandez Lima, and **Fahad Saeed**<sup>†</sup>, “Graph Theoretic Approach for the Analysis of Comprehensive Mass-Spectrometry (MS/MS) Data of Dissolved Organic Matter”, International Workshop on Biological Network Analysis and Integrative Graph-Based Approaches(IWBNA), Proceedings of *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, December 9-12, 2021
45. Umair Muhammad, and **Fahad Saeed**<sup>†</sup>, “Simulation Testbed for Evaluating Distributed Querying and Searching of Mass Spectrometry Big Data in a Network-based Infrastructure”, *Proceedings of 7th IEEE International Conference on Big Data Service and Applications (IEEE BIGDATASERVICE)*, August 2021.
46. Umair Muhammad, and **Fahad Saeed**<sup>†</sup>, “Search Feasibility in Distributed MS-Proteomics Big Data”, Workshop on High Performance Computing, Big Data Analytics and Integration for Multi-Omics Biomedical Data (HPC-BOD), *Proceedings of 12th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BCB)*, August 2021 (extended abstract).
47. Sumesh Kumar, and **Fahad Saeed**<sup>†</sup>, “Real-time peptide identification from high-throughput Mass-spectrometry data”, Workshop on High Performance Computing, Big Data Analytics and Integration for Multi-Omics Biomedical Data (HPC-BOD), *Proceedings of 12th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BCB)*, August 2021 (extended abstract).
48. Oswaldo Artilles, and **Fahad Saeed**<sup>†</sup>, “TurboBC: A Memory Efficient and Scalable GPU Based Betweenness Centrality Algorithm in the Language of Linear Algebra”, International Workshop on Deployment and Use of Accelerators (DUAC), *50th International Conference on Parallel Processing (ICPP)*, Chicago IL, August 2021
49. Sumesh Kumar, and **Fahad Saeed**<sup>†</sup>, “Communication-optimized micro-architecture to compute Xcorr scores for peptide identification”, *Proceedings of 31st International Conference on Field-Programmable Logic and Applications (FPL)*, May 2021
50. Oswaldo Artilles, and **Fahad Saeed**<sup>†</sup>, “TurboBFS: GPU Based Breadth-First Search (BFS) Algorithms in the Language of Linear Algebra”, 11th IEEE Workshop Parallel/ Distributed Combinatorics and Optimization (PDCO 2021), *IEEE International Parallel and Distributed Processing Symposium Workshops (IEEE IPDPSW)*, May 2021
51. Oswaldo Artilles, and **Fahad Saeed**<sup>†</sup>, “GPU-SFFT: A GPU based parallel algorithm for computing the Sparse Fast Fourier Transform (SFFT) of k-sparse signals”, Workshop on Performance Engineering with Advances in Software and Hardware for Big Data Sciences (PEASH), *Proceedings of IEEE Conference on Big Data (IEEE BigData 2019)*, Los Angeles, CA, USA, Dec. 09-12, 2019
52. Muhammad Haseeb, and **Fahad Saeed**<sup>†</sup>, “Efficient Shared Peak Counting in Database Peptide Search Using Compact Data Structure for Fragment-Ion Index”, *Proceedings of IEEE International Conference on Bioinformatics and Biomedicine (IEEE BIBM)*, San Diego, CA, Nov 2019 (Acceptance Rate: 100/543=18%)
53. Mohammed Aledhari, Shelby Joji, Mohamed Hefeida, and **Fahad Saeed**<sup>†</sup>, “Optimized CNN-based Diagnosis System to Detect the Pneumonia from Chest Radiographs”, Workshop on Computational Aspects for Clinical Diagnostics and Decision Making in Healthcare using Biomedical Signal and Image, *Proceedings of IEEE International Conference on Bioinformatics*

- and *Biomedicine (IEEE BIBM)*, San Diego, CA, Nov 2019
54. Taban Eslami, and **Fahad Saeed**<sup>†</sup>, “Auto-ASD-Network: A technique based on Deep Learning and Support Vector Machines for diagnosing Autism Spectrum Disorder using fMRI data”, Workshop on Machine Learning Models for Multi-omics Data Integration, in Proceedings of *10th ACM Conference on Bioinformatics, Computational Biology (ACM BCB)*, Niagara Falls, New York, September 7-10, 2019.
  55. Muhammad Haseeb, Fatima Afzali, and **Fahad Saeed**<sup>†</sup>, “LBE: A Computational Load Balancing Algorithm for Speeding up Parallel Peptide Search in Mass-Spectrometry based Proteomics”, Workshop of 18th IEEE International Workshop on High Performance Computational Biology (HICOMB), Proceedings of *IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPS)*, Rio de Janeiro, Brazil, May 20, 2019
  56. Taban Eslami, and **Fahad Saeed**<sup>†</sup>, “GPU-DFC: A GPU-based parallel algorithm for computing dynamic-functional connectivity of big fMRI data”, Proceedings of *IEEE International Conference On Big Data Service And Applications (IEEE Big Data Service 2019)*, San Francisco East Bay, California, USA, April 4 - 9, 2019
  57. Usman Tariq, and **Fahad Saeed**<sup>†</sup>, “Parallel Sampling-Pipeline for Indefinite Stream of Heterogeneous Graphs using OpenCL for FPGAs”, Workshop on Energy-Efficient Big Data Analytics, Proceedings of *IEEE International Conference on Big Data (IEEE BigData)*, pp. 4752-4761, Seattle, WA Dec 10-13, 2018 (19.7% acceptance rate)
  58. Mohammed Aledhari, Marianne Di Pierro, and **Fahad Saeed**<sup>†</sup>, “A Fourier-Based Data Minimization Algorithm for Fast and Secure Transfer of Big Genomic Datasets”, Proceedings of *IEEE International Congress on Big Data (BigData Congress)*, pp. 128-134, San Francisco CA USA, July 2-7, 2018 (19.8% acceptance rate)
  59. Taban Eslami, and **Fahad Saeed**<sup>†</sup>, “Similarity based classification of ADHD using Singular Value Decomposition”, Proceedings of *ACM International Conference on Computing Frontiers (ACM-CF)*, Ischia, Italy, May 2018 (33% acceptance rate)
  60. Usman Tariq, Umer Cheema and **Fahad Saeed**<sup>†</sup>, “Power-Efficient and Highly Scalable Parallel Graph Sampling using FPGAs”, Proceedings of *International Conference on Reconfigurable Computing and FPGAs (ReConFig 2017)*, pp. 1-6, Cancun, Mexico, December 4-6, 2017
  61. Sandino N. Vargas-Pérez and **Fahad Saeed**<sup>†</sup>, “Scalable Data Structure to Compress Next-Generation Sequencing Files and its Application to Compressive Genomics”, Proceedings of *IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2017)*, pp. 1923-1928, Kansas City, MO, USA, Nov 13-16, 2017 (18.6% acceptance rate)
  62. Muaaz Gul Awan and **Fahad Saeed**<sup>†</sup>, “An Out-of-Core GPU based dimensionality reduction algorithm for Big Mass Spectrometry Data and its application in bottom-up Proteomics”, Proceedings of *ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB)*, pp. 550–555, Boston MA, August 20-23, 2017 (29% acceptance rate)
  63. Taban Eslami, Muaaz Gul Awan and **Fahad Saeed**<sup>†</sup>, “GPU-PCC: A GPU based technique to compute pairwise Pearson’s Correlation Coefficients for big fMRI data”, Proceedings of *ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB)*, pp. 723–728, Boston MA, August 20-23, 2017 (29% acceptance rate)
  64. Mohammed Aledhari, Ali Marhoon, Ali Al-Qaabi, and **Fahad Saeed**<sup>†</sup>, “A New Cryptography Algorithm to Protect Cloud-based Healthcare Services”, Proceedings of *IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (IEEE/ACM CHASE-SEARCH)*, pp. 37–43, Philadelphia PA, July 2017
  65. Muaaz Gul Awan and **Fahad Saeed**<sup>†</sup>, “GPU-ArraySort: A parallel, in-place algorithm for sorting large number of arrays”, Workshop on High Performance Computing for Big Data, Proceedings of *International Conference on Parallel Processing (ICPP-2016)*, pp. 78-87, Philadel-

- phia PA, August 16-19, 2016
66. Majdi Maabreh, Ajay Gupta and **Fahad Saeed**<sup>†</sup>, “A Parallel Peptide Indexer and Decoy Generator for Crux Tide using OpenMP”, Workshop on High Performance Computing Systems for Biomedical, Bioinformatics and Life Sciences, Proceedings of *International Conference on High Performance Computing & Simulation (HPCS 2016)*, Innsbruck, Austria, July 2016 (**Nominated for Best Paper Award**)
  67. Mohamed S Hefeida and **Fahad Saeed**<sup>†</sup>, “Data Aware Communication for Energy Harvesting Sensor Networks”, Proceedings of *International Conference on Wired & Wireless Internet Communications (WWIC 2016)*, Thessaloniki, Greece May 2016 (27 papers accepted out of 55 papers submitted: 49% acceptance rate)
  68. Mohammed Aledhari, Mohamed S Hefeida and **Fahad Saeed**<sup>†</sup>, “A Variable-Length Network Encoding Protocol for Big Genomic Data”, Proceedings of *International Conference on Wired & Wireless Internet Communications (WWIC 2016)*, Thessaloniki, Greece May 2016 (27 papers accepted out of 55 papers submitted: 49% acceptance rate)
  69. **Fahad Saeed**<sup>†</sup>, “Big Data Proteogenomics and High Performance Computing: Challenges and Opportunities”, Proceedings of *Symposium on Signal and Information Processing for Software-Defined Ecosystems, and Green Computing, IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Orlando Florida, Dec 2015
  70. Sandino N. Vargas-Pérez and **Fahad Saeed**<sup>†</sup>, “A Parallel Algorithm for Compression of Big Next-Generation Sequencing (NGS) Datasets”, Proceedings of *Parallel and Distributed Processing with Applications (IEEE ISPA-15)* Vol.3. pp. 196-201, Helsinki Finland, August 2015
  71. Mohammed Aledhari and **Fahad Saeed**<sup>†</sup>, “Design and Implementation Network Transfer Protocol for Big Genomic Data”, Proceedings of *IEEE Big Data Congress*, pp.281-288, New York City, USA, June 2015 (18% acceptance rate)
  72. Muaaz Gul Awan and **Fahad Saeed**<sup>†</sup>, “On the sampling of Big Mass Spectrometry Data”, Proceedings of *ISCA International Conference on Bioinformatics and Computational Biology (BICoB)*, Honolulu, Hawaii, USA, March 2015
  73. **Fahad Saeed**<sup>†</sup>, Jason Hoffert, and Mark Knepper, “A High Performance Algorithm for Clustering of Large-Scale Protein Mass Spectrometry Data using Multi-Core Architectures”, Proceedings of *IEEE/ACM International Symposium on Network Enabled Health Informatics, Biomedicine and Bioinformatics (HI-BI-BI)*, August 2013 (25% acceptance rate for full papers)
  74. **Fahad Saeed**<sup>†</sup>, Trairak Pisitkun, Jason Hoffert, Guanghui Wang, Marjan Gucek, and Mark Knepper, “An Efficient Dynamic Programming Algorithm for Phosphorylation Site Assignment of Large-Scale Mass Spectrometry Data”, Proceedings of *International Workshop on Computational Proteomics, Proceedings of IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Philadelphia USA, Oct 2012 (20% acceptance rate)
  75. **Fahad Saeed**<sup>†</sup>, Trairak Pisitkun, Jason Hoffert, and Mark A. Knepper, “High Performance Phosphorylation Site Assignment Algorithm for Mass Spectrometry Data using Multicore Systems”, proceedings of *ACM Conference on Bioinformatics, Computational Biology and Biomedicine (ACM-BCB)*, 667-672, Orlando Florida USA, Oct 2012. (33 papers accepted out of 159 papers submitted: 21% acceptance rate)
  76. **Fahad Saeed**<sup>†</sup>, Trairak Pisitkun, Mark A. Knepper, and Jason D. Hoffert, “An Efficient Algorithm for Clustering of Large-Scale Mass Spectrometry Data”, Proceedings of *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, pages 1-4, Philadelphia USA, Oct 2012. (62 short paper accepted out of 299 papers submitted: 20.7 % acceptance rate)
  77. **Fahad Saeed**<sup>†</sup> and Ashfaq Khokhar, “Parallel algorithm for center-star sequence alignments with applications to short reads” Proceedings of *ISCA International Conference on Bioinformatics and Computational Biology (BICoB)*, Las Vegas Nevada, USA, March 2012

78. **Fahad Saeed**<sup>†</sup>, Trairak Pisitkun, Mark A. Knepper, and Jason D. Hoffert, "Mining Temporal Patterns from iTRAQ Mass Spectrometry (LC-MS/MS) Data" Proceedings of *ISCA Bioinformatics and Computational Biology Conference (BICoB)* pp 152-159, New Orleans USA, March 2011 .
79. **Fahad Saeed** and Ashfaq Khokhar, "Sample-Align-D: A High Performance Multiple Sequence Alignment System using Phylogenetic Sampling and Domain Decomposition", Proceedings of *IEEE International Workshop on High Performance Computational Biology, IPDPS*, Monday, April 2008.

## 7.7 Peer-Reviewed Abstracts and Posters

80. Robert Loreda, and Fahad Saeed, "Quantum-Centric Supercomputing Strategies for Neuroscience problems: Challenges and Progress", Quantum Computing Algorithms, Systems, and Applications (Q-CASA) Workshop, *International Parallel and Distributed Processing Symposium (IPDPS)*, May 15-19, 2023, St. Petersburg, FL (**Invited Abstract**)
81. Muhammad Haseeb, and Fahad Saeed, "GPU-Acceleration of the Distributed-Memory Database Peptide Search on Supercomputers", ASMS Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN May 2022
82. Usman Tariq, and Fahad Saeed, "Improving MS/MS-based Peptide Database Search using Deep Learning", ASMS Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN May 2022
83. Paulina Acosta, Usman Tariq, Fahad Saeed, "Deep-Learning Network for Classifying Diseases using Mass Spectrometry Data", Undergraduate Research Conference FIU, March 2022 Miami FL
84. Usman Tariq, Francisco Alberto Fernandez Lima, and Fahad Saeed, "Towards a Computational Workflow for the Analysis of DOM Fragmentation Data", ASMS Conference on Mass Spectrometry and Allied Topics, Houston, Texas, May 31 - June 4, 2020
85. Hyun Jun Jung, Bronte Wen, Lihe Chen, Fahad Saeed and Mark A. Knepper, "NGS-Integrator: A Tool for Combining Information from Multiple Genome-Wide NGS Data Tracks Using Minimum Bayes Factors", *The FASEB Journal*, Vol. 33, No. 1 supplement April 2019
86. Jae Wook Lee, Chung-Lin Chou, **Fahad Saeed**, and Mark A. Knepper, "RNA-seq of Microdissected Renal Tubules Identifies Segment-Specific Transcription Factors", poster presentation at *American Society of Nephrology (ASN)*, August 2013.
87. Jae Wook Lee, Chung-Lin Chou, **Fahad Saeed**, and Mark A. Knepper, "RNA-seq Identification of Transcriptome of Native DCT1 Cells", poster presentation at *American Society of Nephrology (ASN)*, August 2013.
88. Jae W. Lee, **Fahad Saeed**, Chung Lin Chou and Mark A. Knepper, "RNA-Seq Mapping Of G Protein-Coupled Receptor Expression along the Nephron and Collecting Duct", poster presentation at *American Society of Nephrology (ASN)*, August 2013.
89. Steven J Bolger, Patricia A Gonzales, Jason D Hoffert, **Fahad Saeed**, Trairak Pisitkun and Mark A Knepper, "Quantitative phosphoproteomics implicates clusters of proteins involved in cell-cell adhesion and transcriptional regulation in the vasopressin signaling network", meeting abstracts *Experimental Biology (EB)*, July 2013
90. Boyang Zhao, Trairak Pisitkun, Jason D. Hoffert, Mark A. Knepper, and **Fahad Saeed**, "An Information Theory-Based Approach to Assess the Functional Significance of Phosphorylation Sites in Proteomes of Renal Tubule Epithelia", poster at *International Society of Nephrology (ISN) Symposium*, Ann Arbor Michigan, USA, June 2012
91. **Fahad Saeed**, J. Hoffert, P. Pisitkun, M. Knepper, "Mapping-based temporal pattern min-

ing algorithm identifies unique clusters of phosphopeptides regulated by vasopressin in collecting duct”, meeting abstracts *Experimental Biology (EB)*, Washington DC, USA, April 2011.

92. J. Hoffert, T. Pisitkun, **Fahad Saeed**, J. Song, M. Knepper, “Large-scale iTRAQ-based quantification of phosphorylation changes during vasopressin signaling”, Featured Topic and abstract *Experimental Biology (EB)*, Washington DC USA, April 2011.
93. **Fahad Saeed** and Ashfaq Khokhar, “Parallel Algorithm for Center Star Sequence and Alignments with applications to short reads”, International Conference On *Bioinformatics and Computational Biology (ACM-BCB)* in August 2010.

## 7.8 Talks and Presentations

1. “Quantum-Centric Supercomputing Strategies for Neuroscience problems: Challenges and Progress”, *Quantum Computing Algorithms, Systems, and Applications (Q-CASA)*, IPDPS, May 15th, 2023 (**Invited Talk**)
2. “Importance of high performance computing for big data computational biology”, Opening remarks as program co-chair at the *22nd IEEE International Workshop on High Performance Computational Biology (HiCOMB)*, IPDPS, May 15th, 2023
3. “Solving Grand Challenges in Proteomics and Neuroscience with High Performance Data Analytics and Machine-Learning models: Challenges, and Progress”, *Electrical and Computer Engineering, University of Miami, Coral Gables, FL*, April 27th, 2023.
4. “Fi-Sci Analogies to narrate Science and complex ideas”, *International Conference on Narrative*, March 4th, 2023 (**Keynote Panel: )**
5. “Machine Learning: Applications and Opportunities in Biomedical Science”, *Dept. of Computing Sciences, University of Houston - Clear Lake (UHCL), Houston, TX*, Nov 29th 2022 (**Invited Talk**)
6. “Data Analytics and Machine-learning models to solve problems in Proteomics and Neuroscience”, *Electrical and Computer Engineering, University of Miami, Coral Gables, FL*, Nov 15th 2022 (**Invited Talk**)
7. “Solving Grand Challenges in Proteomics and Neuroscience with High Performance Data Analytics and Machine-Learning models: Progress and Lessons Learned”, *14th International Conference on Bioinformatics and Computational Biology (BICOB)*, March 22nd, 2022 (**Keynote Speaker**) [https://sceweb.sce.uhcl.edu/bicob22/invited\\_speakers.html](https://sceweb.sce.uhcl.edu/bicob22/invited_speakers.html)
8. “Machine-learning and HPC Models for Big Data Proteomics”, *15th IEEE International Conference on Open Source Systems & Technologies (ICOSST 2021)*, Dec 16th 2021 (**Distiguished invited talk**) <https://icosst.kics.edu.pk/2021/invited-speakers/>
9. “Machine-learning Models for Big Data Omics: Challenges, Opportunities and Progress”, *Machine-Learning Focus Group, Florida International University (FIU)*, April 20th, 2021 (**Invited Talk**)
10. “Machine-learning Models for Big Data Omics: Challenges, Opportunities and Progress”, *Biomolecular Sciences Institute, Florida International University (FIU)*, Feb 26th, 2021 (**Invited Talk**)
11. “Importance of high-performance computing in the context of multiomics data anlysis, machine-learnig models”, *ACM-BCB HPC-BOD Workshop Introductory chair remarks*, Virtual, Sept 21, 2020
12. “HPC Techniques for Big Mass Spectrometry Proteomics Data using GPU’s”, *National Energy Research Scientific Computing Center (NERSC), Lawrence Berkeley National Laboratory, Berkeley, CA*, June 30th 2020 (**Invited Talk**)

13. "Compact Indexing for Fragment-Ion Efficient Shared-Peak Counting from Mass Spectrometry Proteomics Data", *IEEE BIBM*, San Diego CA, Nov 2019
14. "Extreme Scale Omics and Next Generation of Computational Infrastructure", *IEEE BIBM*, San Diego CA, Nov 2019 (Invited Talk) [declined due to scheduling conflict]
15. "Supercomputing and Machine-Learning for Big Omics data", Research Day at SCIS, *Florida International University (FIU)*, Miami, Florida, Oct 2019
16. "Challenges and Entrepreneurial Opportunities in Big Data Omics", at the FIU SCIS Industry Advisory Board Meeting, *Florida International University (FIU)*, Miami, Florida, April 2019
17. "Extreme Scale Omics and Next Generation of Computational Infrastructure", at the School of Computing and Information Sciences, *Florida International University (FIU)*, Miami, Florida, August 2018
18. "Data-Reduction Algorithms for Big Data Proteomics: Challenges, Opportunities and Progress", at the Department of Mathematics and Statistics, *Western Michigan University (WMU)*, Kalamazoo, MI, April 2018 (**Invited**)
19. "Big Data Proteogenomics and High Performance Computing: Challenges, Progress and Opportunities", at the School of Computing and Information Sciences, *Florida International University (FIU)*, Miami, Florida, Jan 2018
20. "Reductive and HPC Analytics for Big Mass Spectrometry Data and its applications to Proteomics", *ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BCB)*, Boston MA, August 2017
21. "Big Data Proteogenomics and High Performance Computing: Challenges and Opportunities", *Symposium on Signal and Information Processing for Software-Defined Ecosystems, and Green Computing, (IEEE GlobalSIP)*, Orlando Florida, Dec 2015
22. "High Performance Computing and Big Data Computational Biology", introductory remarks at the inaugural *IEEE Workshop of High Performance Computing and Big Computational Biology (HPC-BCB)*, *IEEE BIBM*, Washington DC, Nov 2015
23. "Big Data Proteomics: High Performance Computing Methods & Applications", at School of Science & Engineering, *Lahore University of Management Science (LUMS)*, Lahore Pakistan, January 2015 (**Invited Seminar**)
24. "Solving Big Data Problems in Computational Biology using High Performance Architectures and Algorithms", at Department of Electrical Engineering and Computer Systems, *University of Cincinnati*, Cincinnati Ohio, November 2013
25. "Big Data Problems in high-throughput Genomics and Proteomics", at *Cincinnati Children's Hospital Medical Center*, Cincinnati Ohio, November 2013
26. "Solving Big Data Problems in Computational Biology using High Performance Architectures and Algorithms", at Department of Computer Science, *Western Michigan University*, Kalamazoo MI, October 2013
27. "Solving Big Data Problems in Computational Biology using High Performance Architectures and Algorithms", at Department of Electrical and Computer Engineering, *Western Michigan University*, Kalamazoo MI, August 2013
28. "Solving Big Data Problems in Computational Biology using High Performance Architectures and Algorithms", at Innovation Center for Biomedical Informatics, *Georgetown University Medical Center*, Washington DC, August 2013
29. "Clustering and Consensus of Large-Scale Mass Spectrometry Data", Work in Progress Series, Systems Biology Interest Group, National Heart, Lung and Blood Institute (NHLBI), *National Institutes of Health (NIH)*, May 2013.
30. "High Performance Algorithm Engineering for Large-Scale Next Generation Genomics (NGS) Data", at Computer Science Department, *University of Massachusetts Boston*, Boston MA,

March 2013.

31. "High Performance Algorithm Engineering for Large-Scale Next Generation Genomics (NGS) Data", at Electrical, Computer and Systems Engineering Department, *Rensselaer Polytechnic Institute (RPI)*, Albany NY, March 2013.
32. "High Performance Algorithm Engineering for Large-Scale Next Generation Genomics (NGS) Data", at Electrical and Computer Engineering Department, *George Washington University*, Washington DC, Feb 2013.
33. "High Performance Algorithm Engineering for Large-Scale Next Generation Sequencing (NGS) Data", at Center for Genome Research and Biocomputing (CGBC), *Oregon State University*, Corvallis Oregon, Oct 2012.
34. "An Efficient Algorithm for Clustering of Large-Scale Mass Spectrometry Data", *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Philadelphia Pennsylvania, Oct 2012
35. "An Efficient Dynamic Programming Algorithm for Phosphorylation Site Assignment of Large-Scale Mass Spectrometry Data", International workshop on computational proteomics, *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Philadelphia Pennsylvania, Oct 2012
36. "HPC approaches to computational problems in high-throughput genomics and proteomics", at Electrical and Computer Engineering Department, *State University of New York (SUNY) at Binghamton*, Feb 2012
37. "A graph theoretic approach to spectral clustering of mass spectrometry data", Work in Progress Series, Systems Biology Interest Group, National Heart, Lung and Blood Institute (NHLBI), *National Institutes of Health (NIH)*, Jan 2012.
38. "Computational problems in large-scale protein phosphorylation studies using iTRAQ labeled LC MS/MS data", *Bioinformatics and Computational Biology Conference (BICoB)*, New Orleans USA, March 2011.
39. "Dynamic Programming Algorithm for Phosphorylation Site Assignment of Mass Spectrometry Data", Work in Progress Series, Systems Biology Interest Group, National Heart, Lung and Blood Institute (NHLBI), *National Institutes of Health (NIH)*, Feb 2011.
40. "Challenges in multiple alignment of huge number of pyrosequencing reads on multiprocessor platforms", at *Institute of Genetic Medicine, Keck School of medicine, University of Southern California (USC)*, March 2010.
41. "Challenges in multiple alignment of huge number of pyrosequencing reads on multiprocessor platforms", at *school of medicine, University of Colorado at Denver(UCD)*, Feb 2010.
42. "How to multiple align huge number of short reads", at *Critical Assessment of Massive Data Analysis (CAMDA)* Oct 2009. **(Invited)**
43. "An Efficient Multiple Alignment system for Pyrosequencing Reads", at *Bioinformatics and Computational Biology Conference (BICoB)* April 09.
44. "Online scheduling of equal length Jobs on Parallel Machines", *Seminar UIC CS501*, Dec 08.
45. "A Domain Decomposition strategy for Multiple Alignment of Biological Reads", at *Laboratory of Computational Population Biology, UIC*, Nov 08. **(Invited)**
46. "A Sampling based High Performance Multiple Alignment systems" , at *Proc. IEEE International Workshop on High Performance Computational Biology, IPDPS* April 08.
47. "An overview of Multiple Alignment systems, parallel approaches and their limitations", *Seminar UIC CS502*, May 07.

## 7.9 Thesis

1. **Fahad Saeed**, “High performance computational biology algorithms”, (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses (Accession Order No. AAT 3431281, ISBN: 9781124308067), 2010.
2. **Fahad Saeed**, Fahad A. Arshad and Salman Javed, “Design and Implementation of Linux Based Wireless Ad-Hoc Network based Compute Laboratory”, (Undergraduate Final Report), Submitted as partial requirements for BSc. degree in Electrical Engineering University of Engineering and Technology Lahore, 2005.

## 7.10 Technical Reports

1. Muhammad Haseeb, **Fahad Saeed (Editor)**, “High Performance Computing Algorithms for Accelerating Peptide Identification from Mass-Spectrometry Data Using Heterogeneous Supercomputers”, FIU School of Computing and Information Sciences Technical Report (39), 2023. (Weblink: [https://digitalcommons.fiu.edu/cs\\_fac/29](https://digitalcommons.fiu.edu/cs_fac/29))
2. **Fahad Saeed**, Lukas Burger, Ashfaq Khokhar, and Mihaela Zavolan, “A graph-theoretic framework for efficient computation of HMM based motif finder”, Technical Report, *University of Illinois at Chicago*, Jan 2010.
3. **Fahad Saeed**, “High Performance Graph Theoretic model for finding Regulatory Elements and motifs”, Technical Report, Zavolan Group, *Swiss Institute of Bioinformatics (SIB), University of Basel Switzerland*, August 2009.
4. **Fahad Saeed**, “High Performance Multiple Alignment Systems for Pyrosequencing Reads of very large number”, Technical Report, Beerenwinkel Group Computational Biology, *Department of Biosystems Science and Engineering, Eth Zurich Switzerland*, August 2008.
5. **Fahad Saeed** and Ashfaq Khokhar, “An overview of parallel programs for multiple sequence alignments and their limitations”, technical report, *Parallel Algorithms and Multimedia System Laboratory, University of Illinois at Chicago*, May 2007.
6. **Fahad Saeed**, “Securing Suparco’s Computer Networks and Linux Operating Systems”, Internal research Report on *Suparco’s Computer Networks Security X11/04/2006-I*, made official on April 2006.
7. **Fahad Saeed**, Fahad Ali Arshad and Salman Javed, “Design and Implementation of Linux based wireless ad-hoc network”, *Linux Focus*, article 390, Dec 2005.

## 7.11 Software (Released under GNU GPL or provided as a web-service)

### 1. HiCOPS

Database peptide search algorithms deduce peptides from mass spectrometry data. There has been substantial effort in improving their computational efficiency to achieve larger and more complex systems biology studies. However, modern serial and high-performance computing (HPC) algorithms exhibit suboptimal performance mainly due to their ineffective parallel designs (low resource utilization) and high overhead costs. We present an HPC framework, called HiCOPS, for efficient acceleration of the database peptide search algorithms on distributed-memory supercomputers. HiCOPS provides, on average, more than tenfold improvement in speed and superior parallel performance over several existing HPC database search software. We also formulate a mathematical model for performance analysis and optimization, and report near-optimal results for several key metrics including strong-scale efficiency, hardware utilization, load-balance, inter-process communication and I/O overheads. The core parallel design, techniques and optimizations presented in HiCOPS

are search-algorithm-independent and can be extended to efficiently accelerate the existing and future algorithms and software. Our HPC framework can be downloaded from the following link: <https://hicops.github.io/>.

## 2. **Specollate**

We designed and developed a Deep Cross-Modal Similarity Network called SpeCollate, which overcomes these inaccuracies by learning the similarity function between experimental spectra and peptides directly from the labeled MS data. SpeCollate transforms spectra and peptides into a shared Euclidean subspace by learning fixed size embeddings for both. Our proposed deep-learning network trains on sextuplets of positive and negative examples coupled with our custom-designed SNAP-loss function. Online hardest negative mining is used to select the appropriate negative examples for optimal training performance. We use 4.8 million sextuplets obtained from the NIST and MassIVE peptide libraries to train the network and demonstrate that for closed search, SpeCollate is able to perform better than Crux and MSFragger in terms of the number of peptide-spectrum matches (PSMs) and unique peptides identified under 1% FDR for real-world data. SpeCollate also identifies a large number of peptides not reported by either Crux or MSFragger. To the best of our knowledge, our proposed SpeCollate is the first deep-learning network that can determine the cross-modal similarity between peptides and mass-spectra for MS-based proteomics. We believe SpeCollate is significant progress towards developing machine-learning solutions for MS-based omics data analysis. Our machine-learning model can be downloaded from the following link: <https://deepspecs.github.io/>.

## 3. **ASD-DiagNet**

We propose a framework called ASD-DiagNet for classifying subjects with Autism Spectrum Disorder (ASD) from healthy subjects by using only fMRI data. We designed and implemented a joint learning procedure using an autoencoder and a single layer perceptron which results in improved quality of extracted features and optimized parameters for the model. Further, we designed and implemented a data augmentation strategy, based on linear interpolation on available feature vectors, that allows us to produce synthetic datasets needed for training of machine learning models. The proposed approach is evaluated on a public dataset provided by Autism Brain Imaging Data Exchange including 1035 subjects coming from 17 different brain imaging centers. Our machine learning model outperforms other state of the art methods from 13 imaging centers with increase in classification accuracy up to 20% with maximum accuracy of 80%. The machine learning technique presented in this paper, in addition to yielding better quality, gives enormous advantages in terms of execution time (40 minutes vs. 6 hours on other methods). The tool can be downloaded from the following link: <https://github.com/pcdslab/ASD-DiagNet>

## 4. **MaSS-Simulator**

MaSS-Simulator is capable of simulating MS/MS spectra for LC-MS/MS based proteomics experiments. Our recently introduced MaSS-Simulator is capable of simulating highly accurate MS/MS spectra for LC-MS/MS based proteomics experiments. It provides great degree of control over the simulation by providing multiple configurable parameters. MaSS-Simulator offers a platform to assess and mark the limitations of MS-proteomics algorithms by testing them against a curated set of data and whole range of parameters. A complete evaluation report of an algorithm using all possible parametric verifications will provide a much deeper insight to the performance of of a given algorithm. Such evaluation will solve the reproducibility issues that are frequently faced in proteomics algorithm development. Testing of tools using such curated data set for which parameters (e.g. peptide coverage, S/N ratio etc.) can be carefully explored will rigorously evaluate the proteomics algorithms. In general, one

can vary (to a practical degree) the size of the peptide, the coverage, the S/N ratios of the spectra and addition of PTM's in the simulated spectra created for benchmarking. Further, such reproducible evaluation of proteomics algorithms will enable method developers to endorse algorithms with confidence and reliability. Such an approach will also be helpful for the users, who can evaluate their dataset and cross-reference its properties with the algorithm's evaluation report to conclude if the given algorithm will serve their purpose or if it will be able to achieve the required level of performance. The tool can be downloaded from the following link: <https://github.com/pcdslab/MaSS-Simulator>

#### 5. **J-Eros**

J-Eros is a machine learning algorithm for computing similarity between two multivariate time series along with k-Nearest-Neighbor classifier, to classify healthy vs ADHD children using just fMRI data without using any other data or demographics. We applied this technique to the public data provided by ADHD-200 Consortium competition and our results show that J-Eros is capable of discriminating healthy from ADHD children such that we outperformed other state of the art techniques. This machine learning algorithm is a major step towards diagnosing ADHD using quantitative methods and will be an essential part for diagnosing mental illnesses. The algorithm is developed in python and can be accessed at <https://github.com/pcdslab/J-Eros>

#### 6. **PHYNGSC**

phyNGSC is a hybrid strategy between MPI and OpenMP to accelerate the compression of big FASTQ datasets by combining the best features of distributed and shared memory architectures to balance the load of work among processes, alleviate memory latency by exploiting locality and accelerate I/O by reducing excessive read/write operations and inter-node message exchange. The algorithm introduces a novel timestamp-based approach which allows concurrent writing of compressed data in a non-deterministic order and thereby allows us to exploit a high amount of parallelism. As a proof-of-concept, we implemented some methods developed for DSRC v1 to underline the compression portion of our hybrid parallel strategy, since it exhibits superior performance for sequential solutions. The parallel algorithm is developed using C/C++, MPI and OPENMP constructs and is available at <https://github.com/pcdslab/PHYNGSC>.

#### 7. **GPU-ArraySort**

GPU-ArraySort is a highly scalable parallel algorithm for sorting large number of arrays using a GPU. Existing techniques focus on sorting a single large array and cannot be used for sorting large number of smaller arrays in an efficient manner. Such small number of large arrays are common in many big data applications in fields such as proteomics, genomics, connectomics, and astronomy. Our algorithm performs in-place operations and makes minimum use of any temporary run-time memory. Our results indicate that we can sort up to 2 million arrays having 1000 elements each, within few seconds. We compare our results with the unorthodox tagged array sorting technique based on NVIDIA's Thrust library. GPU-ArraySort out-performs the tagged array sorting technique by sorting three times more data in a much smaller time. The developed tool and strategy is made available at <https://github.com/pcdslab/GPU-ArraySort-2.0>.

#### 8. **MS-Reduce**

MS-Reduce is a linear-time tool that allows massive reduction in amount of mass spectrometry data without significantly reducing the quality of the peptide deduction. Our novel data-reductive strategy for analysis of Big MS data is called MS-REDUCE and is capable of eliminating noisy peaks as well as peaks that do not contribute to peptide deduction before any peptide deduction is attempted. Our experiments have shown up to 100x speed up over

existing state of the art noise elimination algorithms while maintaining comparable high quality matches. Using our approach we were able to process a million spectra in just under an hour on a moderate server which will be especially useful for processing in high-throughput environments. The algorithms has been implemented in Java and code/associated data sets are available on GitHub <https://github.com/pcdslab/MSREDUCE>.

#### 9. ParaDSRC

ParaDSRC is a high-performance tool for compressing next generation sequencing data using memory-distributed clusters. It uses domain decomposition and message passing interface (MPI) to distributed data on memory-distributed compute nodes. Our implementation gives near-linear speedups for most of the data sets with some evidence of super-linear speedups for some data sets. We report experimental results for up to 1 tera byte (TB). The algorithm has been implemented using C/C++ and MPI and the code is available on GitHub here <https://github.com/PCDS/paraDSRC>

#### 10. PhosSA

PhosSA is a program for phosphorylation site assignment of LC-MS/MS data. It uses a linear-time and linear space dynamic programming strategy for phosphorylation site assignment. The algorithm optimizes the objective function defined as the summation of intensity peaks that are associated with theoretical peptide fragmentation ions. A classifier introduced in the algorithm exploits the specific characteristics of mass spectrometry data to distinguish between the correctly and incorrectly assigned site(s). The algorithm has been implemented in JAVA. An executable and instruction to use the software can be downloaded from <http://helixweb.nih.gov/ESBL/PhosSA/>.

#### 11. CPhos

Cphos is a program to calculate and visualize evolutionary conserved Phosphorylation sites. CPhos utilizes an information theory-based algorithm to assess the conservation of phosphorylation sites among species. A conservation established from this approach can be used to potentially assess the functional significance of a particular phosphorylation site. A web-service and executable are available from <http://helixweb.nih.gov/CPhos/>

#### 12. P-Pyro-Align

P-Pyro-Align is an open source parallel algorithm for multiple alignment of pyrosequencing reads from multiple genomes. The proposed alignment algorithm accurately aligns the erroneous reads and the accuracy of the alignment is confirmed from the consensus obtained from the multiple alignments. The algorithms uses domain decomposition for parallel computations of the local multiple alignments and a novel merging technique for global alignment of the reads. The proposed algorithm shows super-linear speedups for large number of reads. Note that the algorithm is for multiple alignment of reads coming from different strains of genomes which cannot be handled using mapping of the reads to a reference genome. The code has been implemented using C/C++ and MPI library.

## 8 Student Research Supervision

### 8.1 Awards Received by Students and Postdocs

1. Muhammad Umair, *Knight Foundation Fellowship in Healthcare Technology Innovation class*, Baptist Health Innovations, Baptist Health South Florida, August 2022
2. Muhammad Haseeb, *Best Graduate Research Award*, School of Computing & Information Sciences (SCIS), FIU, Dec 2021

3. Tianren Yang, *Best Graduate Teaching Award*, School of Computing & Information Sciences (SCIS), FIU, Dec 2020
4. Muaaz Awan, *All-University Graduate Research and Creative Scholar Award*, WMU (most significant honor that Western Michigan University bestows upon its graduate students), 2019.
5. Muaaz Awan, *WMU Graduate College Research Grant* for GPU computing, 2018;
6. Sandino N. Vargas-Pérez, *Winner of Regional 3MT competition*, 2017.
7. Muaaz Awan, *Department-Level Graduate Research and Creative Scholars Award* at WMU, 2015.

## 8.2 Postdoctoral Fellows Supervision

1. Muhammad Umair, PhD, (Oct 2020 - date)  
Postdoctoral Research Fellow at Parallel Computing and Data Science Lab
2. Mai A. Alduailij, PhD, (Oct 2020 - Aug 2021)  
Assistant Professor  
College of Computer and Information Sciences (CCIS)  
Princess Nourah Bint Abdulrahman University  
Riyadh, Saudi Arabia

## 8.3 PhD Dissertations (as Chair)

1. Muhammad Haseeb, Fall 2017 - Spring 2023  
Dissertation Title: High-Performance Computing Algorithms for Accelerating Peptide Identification from Mass-Spectrometry Data using Heterogeneous Supercomputers  
First Position: Postdoctoral Fellow, National Energy Research Scientific Computing Center (NERSC), Lawrence Berkeley (DOE) National Laboratory, Berkeley CA USA
2. Taban Eslami, Fall 2015 - Spring 2020  
Dissertation Title: High-Performance Computing and Machine-Learning Models for Big fMRI data  
First Position: Machine Learning and image processing engineer at ZEISS, Minneapolis Minnesota USA
3. Muaaz Gul Awan, Fall 2014 - Summer 2019  
Dissertation Title: High-Performance Computing Reductive Strategies for Big Data from LC-MS/MS based Proteomics  
First Position: Post-Doctoral Fellow, National Energy Research Scientific Computing Center, Lawrence Berkeley National Laboratory (Berkeley Lab), Berkeley CA USA  
Last Known Position: Permanent Staff Application Performance Specialist, National Energy Research Scientific Computing Center, Lawrence Berkeley National Laboratory (Berkeley Lab), Berkeley CA USA
4. Sandino N. Vargas-Pérez, Summer 2014 - Fall 2017 (Defended Summer 2017)  
Dissertation Title: A Hybrid Parallel Approach to High-Performance Compression of Big Genomic Files and In-Compresso Data Processing  
First Position: Lecturer in CS department at WMU  
Last Known Position: Assistant Professor (Tenure-Track), Kalamazoo College, Kalamazoo MI USA
5. Mohammed Aledhari, Fall 2014 - Fall 2017 (Defended Summer 2017)  
Dissertation Title: A Deep Learning-based Data Minimization Algorithm for Big Genomics Data in Support of IoT and Secure Smart Health Services

Honors: Recipient of 2016 Graduate Student Research Grant at WMU for US\$1000, Recipient of Gwen Frostic Doctoral Fellowship from Western Michigan University for US\$ 4000

First Position: Assistant Professor (Tenure-Track), Computer Science Department, Kennesaw State University, Marietta, GA USA;

Last Known Position: Assistant Professor (Tenure-Track) University of North Texas (UNT) in Fall 2022.

6. Mohammad Abu Shattal (jointly supervised with Prof. Ala Al-Fuqaha), Summer 2014 - Fall 2017 (Defended Fall 2017)

Dissertation Title: Bio-Socially Inspired Strategies in Support of Dynamic Spectrum Access: An Evolutionary Game Theory Perspective

First Position: Post-doctoral Fellow ECE department, Ohio State University, Columbus, OH

Last Known Position: Senior Lecturer, Electrical and Computer Engineering Department, Ohio State University, Columbus, OH USA

## 8.4 PhD Student Supervision

### *Current PhD students (post prelim)*

1. Usman Tariq, Fall 2018 - Summer 2023 (expected)  
PhD student in the SCIS, FIU
2. Oswaldo Artiles, Fall 2019 - Summer 2023 (expected)  
PhD student in the SCIS, FIU

### *Current PhD students (post qualifier)*

1. Sumesh Kumar, Fall 2019 - Fall 2025 (expected)  
PhD student in the SCIS, FIU
2. Fahad Almuqhim, Spring 2020 - Fall 2026 (expected)  
PhD student in the SCIS, FIU
3. Tianren Yang, Fall 2020 - Fall 2025 (expected)  
PhD student in the SCIS, FIU

### *Current PhD students (pre-qualifier)*

1. Samuel Ebert, Spring 2023 - Spring 2028 (expected)  
PhD student in the SCIS, FIU
2. Given Suman, Fall 2020 - Fall 2025 (TBBS NIGMS T32 Fellowship Program) PhD student in Department of Biochemistry (co-advised with Dr. Francisco Fernandez-Lima)
3. Robert Loreda, Fall 2020 - Fall 2026 (expected)  
PhD student in the SCIS, FIU

### *Former PhD Students supervision*

1. Sarah Rashidian, May 2012 to Aug 2012  
PhD Student at National Institutes of Health (NIH)  
Project Title: Phosphorylation site assignment for large-scale mass spectrometry data  
Last Known Position: PhD student at Towson University, MD USA

### *Member of PhD Dissertation Committee*

1. Khandaker Mamun Ahmed, FIU School of Computing, 2023 - (Advisor: Hadi Amini)

2. Seyedsina Nabavirazavi, FIU School of Computing, 2023 - (Advisor: SS Iyengar)
3. Masrur Sobhan, FIU School of Computing, 2022 - (Advisor: Ananda M. Mondal)
4. Saimra Zad, FIU School of Computing, 2019 -2022 (Advisor: Mark A. Finlayson)
5. Abdullah Al Mamun, FIU School of Computing, 2019 - 2022 (Advisor: Ananda M. Mondal)
6. Raihanul Bari Tanvir, FIU School of Computing, 2019 - 2023 (Advisor: Ananda M. Mondal)
7. Adnan Maruf, FIU School of Computing, 2020 - 2023 (Advisor: Janki Bhimani)
8. Yashas Hariprasad, FIU School of Computing, 2022 - (Advisor: SS Iyengar)
9. Samuel A. Miller, FIU Department of Chemistry, 2021 - (Advisor: Francisco AF Lima)
10. Hugo Riggs, FIU Electrical and Computer Engineering, 2021 - 2023 (Advisor: Arif Sarwat)
11. Anurag Acharya, FIU School of Computing, 2019 - (Advisor: Mark A. Finlayson)
12. Mohammad Asif Iqbal Khan, FIU Electrical and Computer Engineering, 2020 - 2022 (Advisor: Sumit Paudyal)
13. Morgan Jusko, FIU Department of Psychology, 2020 - (Advisor: Joseph Raiker/Gregory Fabiano)
14. Pedro Espina, FIU School of Computing, 2020 - (Advisor: Niki Pissinou)
15. Manoj Pravakar Saha, FIU School of Computing, 2020 - (Advisor: Janki Bhimani)
16. Daniel Ruiz-Perez, FIU School of Computing, 2019 - (Advisor: Giri Narasimhan)
17. Liqun Yang, FIU School of Computing, 2019 - (Advisor: Wei Zeng)
18. Mohammed Aldawsari, FIU School of Computing, 2019 - (Advisor: Mark A. Finlayson)
19. Taylor Salo, FIU Department of Psychology, 2018 - (Advisor: Angela Laird)
20. Semsi Coskun, WMU Civil Engineering Department, 2017 - (Advisor: Houssam A Toutanji)
21. Hasnaa Al Shaikhli, WMU CS department, 2017 - (Advisor: Elise DeDoncker)
22. Samah Rahamneh, WMU ECE department, 2017 - (Advisor: Ikhlas Abdel-Qader)
23. Ting-Yu Mu, WMU CS department, 2017 - (Advisor: Ala Al-Fuqaha)
24. Omar Abed Darwish, WMU CS department, 2017 - (Advisor: Ala Al-Fuqaha)
25. Chung-Ling Lin, WMU CS Department, 2014 - (Advisor: Wuwei Shen)

*Member of PhD Qualifying-Exam Committee*

1. Jimeng Shi, FIU School of Computing, 2023 - (Advisor: Giri Narasimhan)
2. Yashas Hariprasad, FIU School of Computing, 2023 - (Advisor: S.S. Iyengar)
3. Anshu Sharma, FIU School of Computing, 2023 - (Advisor: Mark Finlayson)
4. Masrur Sobhan, FIU School of Computing, 2022 - (Advisor: Ananda Mondal)
5. Tisa Islam Erana, FIU School of Computing, 2022 - (Advisor: Mark Finlayson)
6. Robin Stubbs, Department of Biological Sciences, 2021 (Advisor: DeEtta (Dee) Mills)
7. Tasmia Aqila, FIU School of Computing, 2020 - (Advisor: Ananda M. Mondal)
8. Abdullah Al Mamun, FIU School of Computing, 2019 - (Advisor: Ananda M. Mondal)
9. Anurag Acharya, FIU School of Computing, 2019 - (Advisor: Mark A. Finlayson)
10. Arpit Mehta, FIU School of Computing, 2018 - (Advisor: Giri Narasimhan)
11. Labiba Jahan, FIU School of Computing, 2018 - (Advisor: Mark A. Finlayson)

## **8.5 M.S. Student Supervision**

*Current MS Thesis Students*

1. Samuel Ebert, (CS, MS), Dec 2022 - May 2023 (Admitted to the PhD program at KFSCIS FIU starting summers 2023)

*Current Non-Thesis Research Students*

1. Siddhi Lanke (CIS, MS), Aug 2022 - June 2023  
MS data science student for Capstone Project, FIU
2. Abhilash Rana (CIS, MS), Aug 2022 - June 2023  
MS data science student for Capstone Project, FIU
3. Carlos Escudero Castillo(CIS, MS), Aug 2022 - June 2023  
MS data science student for Capstone Project, FIU

#### *Former MS Thesis Students*

1. Usman Tariq (ECE, WMU), Fall 2016 - Spring 2018  
Thesis Title: Power-Efficient and Highly Scalable Parallel Graph Sampling using FPGAs  
Last Known Position: PhD student WMU
2. Anshab Ali (ECE, IIT Chicago co-advised with Ashfaq Khokhar), Fall 2014 - Spring 2016  
Thesis Title: Clustering Algorithm for Mass Spectrometry data using general-purpose computing on graphics processing units (GPU's)  
Last Known Position: Engineer at Intel Corp., Portland OR
3. Dana Emad Abdul Qader (ECE, WMU), Fall 2014 - Fall 2015  
Thesis Title: A High Performance Architecture for an Exact Match Short-Read Aligner Using Burrow-Wheeler Transform on FPGAs  
Last Known Position: QA Engineer at Stryker Corporation, San Jose CA

#### *Former Non-Thesis MS Research Students*

1. Harun Oz (CIS, FIU), August 2019 - Dec 2019  
MS student in SCIS FIU
2. Priyanka Priyanka, August 2018 - Oct 2018  
MS data science student for Capstone Project, FIU
3. Blake Wrege, Spring 2017 - Summer 2017  
MS student in CS department at WMU  
Project Title: Graphical user interfaces for networking solutions for big data  
Last position: Site Reliability Engineer (SRE) at Apple
4. Srikanth Aravamuthan, Fall 2015 - Summers 2016  
MS student in Statistics department at WMU  
Project Title: statistical models for mass spectrometry based proteomics data  
Last position: N/A
5. Alan Perez-Rathke, Jan 2009 to Jan 2010  
MS student at University of Illinois at Chicago  
Project Title: Multiple sequence alignment algorithms using HPC systems for pyrosequencing reads  
Last Known Position: MD student at University of Illinois at Chicago
6. Jarek Gwarnicki, Jan 2009 to Jan 2010  
MS student at University of Illinois at Chicago  
Project Title: Quality assessment of MSA of pyrosequencing reads using domain decompositions.  
Last Known Position: Software Engineer at a Chicago based gaming company

## **8.6 Undergraduate Researchers**

#### *Current Undergraduate Research Students*

1. Hermes Bonilla, June 2021 -  
B.Sc student in the CIS Department, FIU

*Former Undergraduate Research Students*

1. Lazaro Hurtado, Jan 2022 - August 2022  
B.Sc student in the CIS Department, FIU
2. Paulina Acosta, Jan 2022 - August 2022  
B.Sc student in the CIS Department, FIU  
Last known position: Software engineer at Apple.
3. Osazomon Imarenezor, Jan 2021 - May 2021  
B.Sc student in the CIS Department, FIU
4. John Quitto Graham, Jan 2019 - June 2020  
B.Sc student in the CIS Department, FIU
5. Alejandra Vasquez, June 2020 - June 2021  
B.Sc student in the CIS Department, FIU  
Last known position: Software Engineer at multinational company
6. Emily Costa, Sept 2019 - Aug 2020  
B.Sc student in the CIS Department, FIU  
Last known position: PhD student at Northeastern University
7. Fatima Afzali, Sept 2018 - August 2019  
B.Sc student in the CIS and Mathematics Department, FIU  
Last known position:
8. Richard Larancuente, August 2018 - Dec 2018  
B.Sc student in the CIS Department, FIU
9. Alexis Gonzalez, August 2018 - Dec 2018  
B.Sc student in the CIS Department, FIU
10. Alexander S. Cadigan, May 2017 - Aug 2017  
B.Sc. student in CS Department, Kalamazoo College  
Project Title: Scalability study of Open-Search Algorithms for MS based Proteomics data  
Last Known Position: Computer Science undergrad student at Kalamazoo College, Kalamazoo MI
11. James A Novorita, August 2017 - Dec 2017  
B.Sc student in the ECE Department, WMU  
Project Title: k-mer based alignment of big genomic data using FPGA's  
Last Known Position: Engineer at Stryker Corporation, Kalamazoo MI
12. Blake Wrege, Summer 2016 - Fall 2016  
B.Sc student in the CS Department, WMU Project Title: Graphical User interfaces for big data transmission and sharing  
Last Known Position: MS student at WMU
13. Melissa Basileo, Summer 2015 - Summer 2015  
B.Sc student in the CS Department, WMU
14. Akshay Sanghi, May 2013 to Aug 2013  
B.Sc. student at National Institutes of Health (NIH)  
Project Title: A Knowledge Base of Vasopressin Actions in Kidney  
Last Known Position: MD student at Johns Hopkins University
15. Boyang Zhao, Dec 2011 to Aug 2012  
B.Sc. student at National Institutes of Health (NIH)  
Project Title: Assessing the Functional Relevance of Phosphorylation Sites using Information

Theory and Naive Bayes Classifications

Last Known Position: PhD student at Massachusetts Institute of Technology (MIT)

16. Jacqueline Douglass, Sept 2010 to Aug 2011

B.Sc. student at National Institutes of Health (NIH)

Project Title: Protein Kinase Target-Sequence Profiling Using LC-MSMS

Last Known Position: MD/PhD student at Johns Hopkins University

## 8.7 High School Research Students

### *Current High School Research Students*

1. N/A

### *Former High School Research Students*

1. Hermes Bonilla, June 2020 - June 2021

John Ferguson High School

Last Known position: Undergrad student at SCIS FIU

2. Zoe Srackangast, Gwen Park, and Isabel Holton, Sept 2017 - March 2018

High School student at Kalamazoo Area Mathematics & Science Center

Project Title: Development of Algorithm for Classification of Proteins found in Environmental Samples (Recipient of Out Standing Achievement for Ability and Creativity Award @ SW-Michigan International Science & Engineering Fair (ISEF) 2018)

Last Known Position: Isabel Holton joined Undergraduate program in Electrical Engineering at University of Michigan Ann Arbor

3. Lily Kitagawa, Oct 2015 - March 2016

High School student at Kalamazoo Area Mathematics & Science Center

Project Title: Counting kmers in big genomic data (Recipient of Intel Excellence in Computer Science Award 2016)

Last Known Position: Undergraduate student (Computer Science) at California Institute of Technology (Caltech)

4. Binh Le, August 2014 - March 2015

High School student at Kalamazoo Area Mathematics & Science Center

Project Title: GUI development of computational biology tools for domain scientists

Last Known Position: Undergraduate student at Massachusetts Institute of Technology (MIT)

5. Adam Loles, August 2014 - March 2015

High School student at Kalamazoo Area Mathematics & Science Center

Project Title: GUI development of computational biology tools for domain scientists

Last Known Position: Undergraduate student at Colgate University.

## 8.8 External Examiner

- Umair Ayub, Department of Computer Science, National University of Computer and Emerging Sciences, Islamabad, Pakistan Sept 2022 (Advisor: Dr. Hammad Naveed)
- Kanzal Iman, Department of Biology, SBA School of Science and Engineering, Lahore University of Management Sciences (LUMS), Lahore, Pakistan, 2022 (Advisor: Dr. Safee Ullah Chaudhary)

## 9 Professional and Academic Service

### 9.1 Editorial Boards

- **Associate Editor**, Experimental Results, Cambridge University Press, April 2022
- **Review Editor** on the Editorial Board of Digital Public Health (specialty section of Frontiers in Public Health, Frontiers in ICT and Frontiers in Computer Science), July 2021 to date
- **Statistics and Bioinformatics Board** for Journal of the American Society of Nephrology (JASN), Feb 2019 to date
- **Associate Editor** for Springer Journal of Network Modeling Analysis in Health Informatics and Bioinformatics, Jan 2014 to date.

### 9.2 Guest Editor Special Issues

- Guest Editor for *Journal of Bioinformatics and Computational Biology (JBCB)* special issue containing selected papers from the 7th International Conference on Bioinformatics and Computational Biology, Feb 2016 (with Nurit Haspel and Hisham Al-Mubaid).
- Guest Editor for *Journal of Bioinformatics and Computational Biology (JBCB)* special issue containing selected papers from the 6th International Conference on Bioinformatics and Computational Biology, Oct 2014 (with Hisham Al-Mubaid and Bhaskar Dasgupta).
- Guest Editor for *Journal of Bioinformatics and Computational Biology (JBCB)* special issue containing selected papers from the 5th International Conference on Bioinformatics and Computational Biology, Oct 2013 (with Hisham Al-Mubaid and Bhaskar Dasgupta).

### 9.3 Conference/Workshop Chair

- **Workshop Co-Chair**, 22nd IEEE International Workshop on High Performance Computational Biology (HiCOMB), in conjunction with IEEE International Parallel and Distributed Processing Symposium (IPDPS), St. Petersburg Florida, USA, May 15th, 2023
- **Session Chair** for Big Data and AI, IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI'22) jointly organized with the 17TH IEEE-EMBS International Conference on Wearable and Implantable body Sensor Networks (BSN'22), Sept 2022
- **Workshop Co-Chair**, Workshop on High Performance Computing for Big Omics Data (HPC-BOD), in conjunction with IEEE BIBM, Dec 2022
- **Workshop Co-Chair**, Workshop on High Performance Computing for Big Omics Data (HPC-BOD), in conjunction with ACM-BCB, Aug 2021
- **Workshop Co-Chair**, Workshop on Machine-Learning, and High Performance Computing for Proteomics, in conjunction with KFSCIS and LUMS, Sept 2021
- **Workshop Co-Chair**, Workshop on High Performance Computing for Big Omics Data (HPC-BOD), in conjunction with ACM-BCB, Oct 2020
- **Workshop Chair**, IEEE Workshop on High Performance Computing for Big Omics Data (IEEE HPC-BOD), in conjunction with IEEE BIBM, Nov 2019
- **Track Chair** for Mathematical Modeling and Scientific Computing, IEEE International Conference on Advances in Computing, Communications and Informatics (ICACCI), Jaipur India, 2016
- **Session Chair**, IEEE Workshop on High Performance Computing for Big Data Computational Biology (IEEE HPC-BCB), in conjunction with IEEE BIBM, Washington DC, Nov 2015
- **Founding Workshop Chair**, IEEE Workshop on High Performance Computing for Big Data Computational Biology (IEEE HPC-BCB), in conjunction with IEEE BIBM, Nov 2015

- Tutorials Co-Chair for IEEE International Conference on Collaboration Technologies and Systems (CTS) Atlanta, Georgia, USA, May 2015
- **Program Co-Chair** for 7th Bioinformatics and Computational Biology (BICoB) Conference, March 2015
- Tutorials Co-Chair for IEEE International Conference on Collaboration Technologies and Systems (CTS) Minneapolis, Minnesota, USA, May 2014
- **Program Co-Chair** for International Workshop on Algorithms for Computational Biology (ACB), 2014
- **Program Co-Chair** for 6th Bioinformatics and Computational Biology (BICoB) Conference, Las Vegas, Nevada, March 24-26, 2014
- Session Chair, International workshop on computational proteomics, IEEE International Conference on Bioinformatics and Biomedicine (BIBM), Oct 2012
- Session Chair, IEEE International Conference on Bioinformatics and Biomedicine (BIBM), Oct 2012
- **Program Co-Chair** for 5th Bioinformatics and Computational Biology (BICoB) Conference, Honolulu, Hawaii, March 4-6, 2013
- **Program Co-Chair** for Bioinformatics and Computational Biology (BICoB) Conference, Las Vegas, Nevada, USA, March 12 - 14, 2012

#### 9.4 Selected Conference/Workshop Program Committee Membership

- Program committee member, The 32nd ACM International Conference on Information and Knowledge Management (CIKM), 21-23 Oct, 2023, University of Birmingham and Eastside Rooms, UK
- Program committee member, IEEE International Conference on Bioinformatics and Biomedicine (IEEE BIBM) December 5-8, 2023, Istanbul, Turkey
- Program committee member, 1st Quantum Computing Algorithms, Systems, and Applications (Q-CASA), IPDPS St. Petersburg, Florida on May 15, 2023.
- Program committee member, 14th Student Research Symposium (SRS), 29th IEEE International Conference on High Performance Computing, Data, & Analytics (HiPC 2022) December 18-21, 2022 Bengaluru, INDIA
- Senior Program Committee member, ACM International Conference for Information and Management (CIKM2022), Atlanta GA, Oct 17 2022
- Program committee, 28th IEEE INTERNATIONAL CONFERENCE ON HIGH PERFORMANCE COMPUTING, DATA, & ANALYTICS (HiPC), Dec 2021
- Program committee member for Advanced Machine Learning and Applications: Federated Learning and Meta-Learning (AML-IoT FLAME 2020) at ICMLA 2020
- Program committee member for 15th International Wireless Communications & Mobile Computing Conference (IWCMC 2019), Tangier, Morocco, June 24-28, 2019
- Program committee member for IEEE International Workshop on High Performance Computational Biology (HiCOMB), International Parallel & Distributed Processing Symposium (IPDPS), Rio de Janeiro, Brazil, May 20, 2019
- Program committee member, Fourth International Conference on Research in Computational Intelligence and Communication Network (ICRCICN 2018), Kolkata, India, November 22 - 23, 2018
- Program committee member, Symposium on Bioinformatics and Bioforensics (SBB'18), ICACCI, Bangalore India, Sept 2018
- Program committee member, Workshop on Large Scale Computational Physics (LSCP), In-

- ternational Conference on Computational Science and Applications (ICCSA), June 2018
- Program committee member, First International Symposium on Signal and Image Processing (ISSIP-2017), Kolkata, India Nov 2017
  - Program committee member, IEEE International Conference on Advanced Computational and Communication Paradigms (ICACCP-2017), Sikkim, India 8-10th September 2017
  - Program committee member, 10th International Conference on Security, Privacy and Anonymity in Computation, Communication and Storage (SpaCCS 2017), Guangzhou, China, December 12-15, 2017.
  - Program committee member, International Symposium on Bioinformatics and Bioforensics (SBB'17), International Conference on Advances in Computing, Communications and Informatics (ICACCI), Manipal, India September 13-16, 2017
  - Program Committee Member, International Conference on Advances in Computing, Communications and Informatics (ICACCI), Jaipur, India 2017
  - Program committee member, International Symposium on Bioinformatics and Bioforensics (SBB'16), International Conference on Advances in Computing, Communications and Informatics (ICACCI), Jaipur, India September 21-24, 2016
  - Program committee member, International Symposium on Network Enabled Health Informatics, Biomedicine and Bioinformatics (HI-BI-BI), Aug 2016
  - Program committee member, Workshop on Large Scale Computational Physics (LSCP), International Conference on Computational Science and Applications (ICCSA), June 2016
  - Program committee member, The 15th IEEE International Conference on Data Mining (ICDM), 2015
  - Program committee member, IEEE Symposium on Signal and Information Processing for Software-Defined Ecosystems and Green Computing (IEEE GlobalSIP), Orlando Florida Dec 2015
  - Program committee member, Advancement in Petroleum and Chemical Engineering Technology and Applications International Conference (APCETA), Dec 2015
  - Program committee member, IEEE Information Reuse and Integration in Health Informatics (IRI-HI), San Francisco CA August 2015
  - Program committee member, IEEE/ACM International Symposium on Network Enabled Health Informatics, Biomedicine and Bioinformatics (HI-BI-BI), Paris, France, Aug 26-27, 2015
  - Program committee member, International Workshop on Algorithms for Computational Biology (ACB-2014), Delhi, India, September 2014
  - Program committee member, IEEE/ACM International Symposium on Network Enabled Health Informatics, Biomedicine and Bioinformatics (HI-BI-BI), Beijing, China, August 18-19, 2014
  - Member Steering Committee, 2nd Computational Science Conference, Pakistan Society of Computational Science and Biology (PSCS/PSCB) for High School Students, Islamabad Pakistan, Oct 2013
  - Program committee member for IEEE International Workshop on High Performance Computational Biology (HiCOMB), International Parallel & Distributed Processing Symposium (IPDPS), May 27, 2013
  - Program committee member for ACM conference on Bioinformatics, Computational Biology and Biomedicine (ACM-BCB) conference, Orlando Florida, Oct 7-10, 2012
  - Program committee member for 11th International Workshop on Data Mining in Bioinformatics (BIOKDD '12)
  - Program committee member for 8th International Conference on Bioinformatics and Genome

## 9.5 Peer Reviewer

- Peer Reviewer for *Transactions on Neural Systems & Rehabilitation Engineering*, July 2023
- Peer Reviewer for *Computer Methods and Programs in Biomedicine*, July 2023
- Peer Reviewer for *Hyllion Cell Press*, July 2023
- Peer Reviewer for *Elsevier Neuroscience Informatics*, July 2023
- Peer Reviewer for *Elsevier Asian Journal of Psychiatry*, June 2023
- Peer Reviewer for *IEEE Transaction on on Cybernetics*, March 2023
- Peer Reviewer for *Behavioural Brain Research*, Jan 2023
- Peer Reviewer for *Cybernetics and Systems*, Dec 2022
- Peer Reviewer for *Nature Scientific Reports*, Nov 2022
- Peer Reviewer for *Computer Methods and Programs in Biomedicine*, Sept 2022
- Peer-reviewer for *IAES International Journal of Artificial Intelligence (IJ-AI)*, Sept 2022.
- Peer Reviewer for *Wiley Psychophysiology*, Sept 2022
- Peer Reviewer for *Computer Methods and Programs in Biomedicine*, July 2022
- Peer Reviewer for *Journal of King Saud University - Computer Sciences*, May 2022
- Peer Reviewer for *IEEE Journal of Biomedical and Health Informatics*, March 2022
- Peer Reviewer for *Journal of the American Society of NEPHROLOGY*, March 2022
- Peer Reviewer for *Oxford Bioinformatics*, Feb 2022
- Peer Reviewer for *IEEE Transactions on Medical Imaging*, August 2021
- Peer Reviewer for *ACM Computing Surveys*, Aug 2021
- Peer Reviewer, *Wiley Computational and Systems Oncology*, Dec 2020
- Peer Reviewer for *ACM Computing Surveys*, Dec 2020
- Peer Reviewer for *Frontiers Neurology*, Nov 2020
- Peer Reviewer for *IEEE Transactions on Cloud Computing*, Oct 2020
- Peer Reviewer for *Oxford Bioinformatics*, Oct 2020
- Peer Reviewer for *Journal of the American Society of NEPHROLOGY*, Sept 2020
- Peer Reviewer for *Plos One*, August 2020
- Peer Reviewer for *Oxford Bioinformatics*, June 2020
- Peer Reviewer for *IEEE Access*, June 2020
- Peer Reviewer for *Journal of the American Society of NEPHROLOGY*, May 2020
- Peer Reviewer for *Springer Journal Network Modeling Analysis in Health Informatics and Bioinformatics (NHIB)*, May 2020
- Peer Reviewer for *ACM Transactions on Internet of Things*, April 2020
- Peer Reviewer for *BMC Bioinformatics*, March 2020
- Peer Reviewer for *Springer Nature Translational Psychiatry*, Feb 2020
- Peer Reviewer for *MDPI Journal of Clinical Medicine*, Jan 2020
- Peer Reviewer for *Elsiever Biocybernetics and Biomedical Engineering*, Nov 2019
- Peer Reviewer for *IEEE Access*, Nov 2019
- Peer Reviewer for *Oxford Bioinformatics*, Oct 2019
- Peer Reviewer for *Journal of the American Society of NEPHROLOGY*, Oct 2019
- Peer Reviewer for *Oxford Bioinformatics*, Sept 2019
- Peer Reviewer for *Oxford Bioinformatics*, August 2019
- Peer Reviewer for *Journal of the Evolutionary Biology*, July 2019
- Peer Reviewer for *Journal of the American Society of NEPHROLOGY*, May 2019
- Peer Reviewer for *BMC Bioinformatics*, April 2019

- Peer Reviewer for *Oxford Bioinformatics*, April 2019
- Peer Reviewer for *Journal of Parallel and Distributed Computing (JPDC)*, Jan 2019
- Peer Reviewer for *BMC Bioinformatics*, Jan 2019
- Peer Reviewer for *Journal of the American Society of NEPHROLOGY*, Jan 2019
- Peer Reviewer for *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, Dec 2018
- Expert reviewer for book proposal for *Springer Biomedicine*, August 2018
- Peer Reviewer for *BMC Bioinformatics*, August 2018
- Peer Reviewer for *BMC Bioinformatics*, July 2018
- Peer Reviewer for *Springer Signal, Image and Video Processing Journal*, July 2018
- Peer Reviewer for *IEEE Transactions on Parallel and Distributed Systems*, Feb 2018
- Peer Reviewer for *Wiley Proteomics*, Nov 2017
- Peer Reviewer for *Wiley Proteomics*, Oct 2017
- Peer Reviewer for *BMC Bioinformatics*, Sept 2017
- Peer Reviewer for *Wiley Proteomics*, Aug 2017
- Peer Reviewer for *IEEE Transactions on Parallel and Distributed Systems*, Aug 2017
- Peer Reviewer for *Software Quality Journal*, Jan 2017
- Peer Reviewer for *Springer Journal Network Modeling Analysis in Health Informatics and Bioinformatics (NHIB)*, Jan 2017
- Peer Reviewer for *Oxford Bioinformatics*, Nov 2016
- Peer Reviewer for *Nature Protocols*, Oct 2016
- Peer Reviewer for *Oxford Bioinformatics*, Sept 2016
- Peer Reviewer for *Springer Journal Network Modeling Analysis in Health Informatics and Bioinformatics (NHIB)*, Sept 2015
- Peer Reviewer for *Journal of Bioinformatics and Computational Biology (JBCB)*, July 2015
- Peer Reviewer for *Journal of Computer Science and Technology (JCST)*, May 2015
- Peer Reviewer for *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, March 2015
- Peer Reviewer for *Springer Journal Network Modeling Analysis in Health Informatics and Bioinformatics (NHIB)*, Feb 2015
- Peer Reviewer for *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, Feb 2015
- Reviewer for *Oxford Bioinformatics*, Jan 2015
- Reviewer for *International Journal of Information and Communication Technology (IJICT)*, Jan 2015
- Reviewer for *International Journal of Computers and Their Applications (IJCA)*, September 2014
- Peer Reviewer for *Springer Journal Network Modeling Analysis in Health Informatics and Bioinformatics (NHIB)*, March 2014
- Peer Reviewer for *International Journal of Computer Systems Science and Engineering (IJCSSE)*, 2013
- Peer Reviewer for *BMC Proteome Science*, March 2013
- Peer Reviewer for *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2012
- Peer Reviewer for *International Journal of Computer Systems Science and Engineering (IJCSSE)* 2009 to 2011.

## 9.6 Proposal Panels and Expert Reviews

- NIH Study Section Panelist, Special Emphasis Panel (SEP) for Centers of Biomedical Research Excellence (COBRE) Phase 1 (P20), July 2023
- NSF Panelist, Small Business Innovation Research (SBIR), Partnerships for Innovation (PFI), April 2023
- NSF Panelist, Cyberinfrastructure for Sustained Scientific Innovation (CSSI), Office of Advanced Cyberinfrastructure (OAC), March 2023
- Expert Panelist, New Jersey Governor's Council for Medical Research and Treatment of Autism (Council), May 2023
- NIH Study Section Panelist, Child Psychopathology and Developmental Disabilities (CPDD) study section, Center for Scientific Review (CSR), National Institutes of Health, February 2023
- NSF Panelist, Partnerships for Innovation (PFI) program, Oct 2022
- Expert Panelist, New-Jersey (NJ) Governor's Council for Medical Research and Treatment of Autism (Council), Scientific Peer Advisory and Review Services division of the American Institute of Biological Sciences (AIBS), May 2022
- NIH Study Section Panelist, Clinical Data Management and Analysis Study Section, Center for Scientific Review (CSR), National Institutes of Health, June 2022
- Expert International Reviewer and Panelist, Wellcome Trust, United Kingdom (UK), March 2022
- NIH Study Section Panelist, NCI Translational and Basic Research Early Lesions (U54 and U24) study section, Center for Scientific Review (CSR), National Institutes of Health, March 2022
- Expert Reviewer for Natural Sciences and Engineering Research Council (NESRC) of Canada, Jan 2022
- Expert International Reviewer and Panelist, Belgium Fund for Scientific Research (F.R.S.–FNRS), Jan 2022
- External Expert for Tenure, Oakland University MI USA Nov 2021
- Expert Reviewer for Natural Sciences and Engineering Research Council (NESRC) of Canada, Nov 2021
- NIH Study Section Panelist, NCI Clinical Proteomic Tumor Analysis Consortium (CPTAC) study section, Center for Scientific Review (CSR), National Institutes of Health, Nov 2021
- External Reviewer for Faculty Tenure, Department of Biology, Lahore University of Management Sciences (LUMS), Lahore Pakistan, Sept 2021
- Expert Reviewer for NIH Bridge to Artificial Intelligence (Bridge2AI) study section, NIH Common Fund, Oct 2021
- NIH Study Section Panelist, Biodata Management and Analysis (BDMA) study section, Center for Scientific Review (CSR), National Institutes of Health, Oct 2021
- Expert International Reviewer and Panelist, Belgium Fund for Scientific Research (F.R.S.–FNRS), August 2021
- NIH Study Section Panelist, National Institute of Neurological Diseases and Stroke NST-2 study panel, Center for Scientific Review (CSR), National Institutes of Health, June 2021
- NIH Study Section Panelist, Biodata Management and Analysis (BDMA) study section, Center for Scientific Review (CSR), National Institutes of Health, June 2021
- NSF Panelist, Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) program, Feb 2021
- Academic Advisor for NIH grants, for Hadi Amini (SCIS FIU), and Shabnam Rezapour Behnagh (FIU), National Research Mentoring Network, Univeristy of Utah, Oct 2020 -Jan

2021

- Expert Reviewer, Oak Ridge National Lab (ORAU), NSF MRI UTSA Limited Submission Program, Oct 2020
- Expert Reviewer, Oak Ridge Associated Universities (ORAU), University of Texas at San Antonio's (UTSA) Limited Submission Program, June 2020
- NSF Reviewer, Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) program, May 2020
- DOE Reviewer, Minority Serving Institution Partnership Program, National Nuclear Security Administration (NNSA), April 2020
- Expert International Reviewer and Panelist, Belgium Fund for Scientific Research (F.R.S.–FNRS), March 2020
- Expert Reviewer for Natural Sciences and Engineering Research Council (NESRC) of Canada, Jan 2020
- Expert Reviewer for NIH NIDDK Chronic Renal Insufficiency Cohort Panel, Scientific and Data Coordinating Center (SDCC) at The University of Pennsylvania, August 2019
- Expert International Reviewer and Panelist, The Croatian Science Foundation (HRZZ), July 2019
- NSF Reviewer, Cyberinfrastructure for Sustained Scientific Innovation (CSSI), May 2019 (declined due to COI)
- External Reviewer, The University of Queensland Diamantina Institute, Feb 2019
- Reviewer for Croatian Science Foundation (CSF), March 2018
- NSF Panel, Office of Advanced Cyberinfrastructure (OAC), Oct 2017
- ORAU NSF Big Data Regional Innovation Hub Panel, 2017
- Early Career Reviewer (ECR), Center for Scientific Review (CSR), National Institutes of Health (NIH), March 2017 to date
- Reviewer for Croatian Science Foundation (CSF), March 2014

## **9.7 University and Department service**

### **9.7.1 Florida International University (FIU)**

Mentor for Junior Faculty

- Peer-teaching evaluation of Agoritsa Polyzou (CAP 5771: Principles of Data Mining), Fall 2022.
- Mentor for Hadi Amini, SCIS FIU, Nov 2020 - to date
- Member of FIU Faculty Mentor Program, (Mentor for Dr. Imran Ahmed, Research Assistant Professor — Food, Agriculture, and Bio. Innovation Lab (FABIL), Sept 2020 -
- Member of FIU Faculty Mentor Program, (Mentor for Dr. Xuan Lv, Assistant Professor, CONST, EC), Sept 2018 -

Panelist and Judging Service

- Panelist for SCIS retreat (Research & Funding), Jan 2023
- Panelist for SCIS Professional Development Workshop Series for Junior Faculty, Sept 2020
- Judging in the BSI symposium, Department of Physics FIU, July 2020
- Judge for SCIS Research Day, SCIS FIU, Oct 2019

### **9.7.2 Committee Service**

- Chair KFSCIS Infrastructure Committee, FIU, June 2023 - June 2024

- Chair of Diversity and Inclusion Committee, School of Computing, FIU, June 2022 - June 2023
- Member of Director Search, Knight Foundation School of Computing and Information Sciences (KFSCIS), 2023
- Member of Tenure Track Faculty Hiring Committee, Knight Foundation School of Computing and Information Sciences (KFSCIS) at FIU (2020, 2021, 2022)
- CEC Tenure and Promotion (T&P) Committee (Elected), May 2022 - May 2024
- ABET evaluation and assessment of CDA 3102 (Computer Architecture) course, Dec 2021
- CEC Faculty Senate and University Committee Representative, DAS Evaluation Committee Representative (Elected), May 2021
- Member of Tenure Track Faculty Hiring Committee, Department of Biomedical Engineering at FIU, Dec 2020
- Member of Diversity and Inclusion Committee, School of Computing, FIU, Sept 2020 - May 2022
- Led a team of 5 FIU researchers for Faculty Grantsmanship Development Program –2019-2020. Allowed junior researchers to attend NIH/NSF grant workshops and a seed grant from the FIU Research & Economic Development office.
- Member of Eminent Scholar Chair Promotion Committee, SCIS FIU, August 2019
- Member of College of Engineering and Computing (CEC) Scholarship Committee, April 2019
- Gave a talk entitled “Interdisciplinary Big Data Computational Sciences and Opportunities”, at the School of Computing and Information Sciences (SCIS) Graduate Program Open House & Orientation, Aug 2018
- Member of SCIS Graduate Committee, Aug 2018 - to date
- Member of SCIS Tenure Track Faculty Hiring Committee, Aug 2018 - to date
- Member of SCIS ACM Student Chapter Faculty Advisor, Aug 2018 - to date

### 9.7.3 Western Michigan University (WMU)

- Panelist for NSF CAREER Workshop for Faculty, Office of Vice President of Research (OVPR), WMU, March 2018
- Member of CEAS Faculty Creative Initiative Review Committee, WMU, Feb 2018
- Member of Undergraduate Computer Engineering Curriculum Revision Committee, ECE Department, Sept 2017 - to date
- Panelist for Discover Discovery Workshop for New Faculty, Office of Vice President of Research (OVPR), WMU, Sept 2017
- Member of committee on designing and building Biomedical Engineering Program for CEAS WMU, July 2017 - to date
- Member of CEAS outstanding awards nomination, Jan 2017
- Member of Graduate Committee, CS Department, Sept 2016 - to date
- Member of Undergraduate Computer Engineering Curriculum Revision Committee, ECE Department, Sept 2016 - Dec 2016
- Member sub-committee for research Strategic Plan for College of Engineering and Applied Science (CEAS) WMU, March 2016
- Member of Strategic Plan Committee for College of Engineering and Applied Science (CEAS) WMU, March 2016
- Panelist for Discover Discovery Education and Training for New Faculty, Office of Vice President of Research (OVPR), WMU, Sept 2015

- Member of Undergraduate Computer Engineering Curriculum Revision Committee, ECE Department, Oct 2014 - Aug 2015
- Member of Seminar Committee, ECE Department, Oct 2014 - to date
- Member of Computing Hardware Committee, Computer Science Department, Sept 2014 - to date
- Proctoring service for ECE Qualifying Exam, March 2014
- ECE representative for the College of Engineering and Applied Sciences (CEAS) Scholarship Committee, Feb 2014 - to date

## 9.8 Outreach and Community Service (recent)

- International expert on Curriculum Revision, University of Engineering & Technology (UET) Lahore, June 2020 - June 2021 (1 meeting for per month among faculty at UET Lahore, Iowa State University, Michigan University, and Industry including Intel, Argus Network)
- Participant for NSF Diversity Advocate group at FIU, Dec 2019
- Participant for FIU Bystander Leadership Workshop, Sept 2019
- Judge for Regional Intel Science and Engineering Fair, for high school students (K-12) Kalamazoo Area Math and Science Center (KAMSC), March 2017
- Judge for 16th Annual Southwest Michigan Regional (Intel Science and Engineering) ISEF Science Fair for high school students (K-12) Kalamazoo Area Math and Science Center (KAMSC), March 2016
- Judge for Southwest Michigan Science and Engineering Fair for high school students (K-12) Kalamazoo Area Math and Science Center (KAMSC), March 2015
- Judge for Regional Science and Engineering Fair for high school students (K-12) Kalamazoo Area Math and Science Center (KAMSC), March 2014

## 9.9 Miscellaneous

- Judge in genomics study section for Fellows Award for Research Excellence (FARE), National Institutes of Health (NIH) 2013-2014
- Student representative for Electrical and Computer Engineering Department, Graduate Student Council, University of Illinois at Chicago (Jan 2008 to Summers 2010).

## 10 Consultation Experience

- **Dialectica** Athens Greece Feb 2020  
Consulted for London UK based company who wanted to enter the clinical space related to novel molecular, therapeutics and computational techniques for US hospitals and clinics.
- **Western Michigan University** Kalamazoo, MI USA  
*Computer Science Department* June 2019 to July 2019  
Provided expert consultation on developing machine-learning models for high-dimensional mass spectrometry data. Also advised on high-performance computing solutions to these problems and on systems biology aspects of the work.
- **Chulalongkorn University** Bangkok, Thailand  
*Systems Biology (CUSB) Center* Oct 2013 to Nov 2013  
This work involved design of setting up a compute infrastructure for large-scale system biology computational needs. A memory-distributed compute cluster, a high-performance workstation, an intelligent memory system and GPU's were part of the setup.

- **University of Illinois at Chicago (UIC)** Chicago, IL USA  
*Parallel algorithms and multimedia systems laboratory* May 2010 to August 2010  
 This work involved design of setting up a high-performance compute clusters for computational biology algorithms. A 16-node system was setup as a pilot project.

## 11 Patents

- **Fahad Saeed**, and Fahad Almuqhim, “Systems and Methods for Diagnosing Autism Spectrum Disorder Using fMRI Data”, United States Patent and Trademark Office (USPTO), U.S. Department of Commerce, July 5th, 2022 (*US Patent # 11,379,981 B1*)
- **Fahad Saeed**, and Muhammad Haseeb, “Systems and methods for peptide identification”, United States Patent and Trademark Office (USPTO), U.S. Department of Commerce, April 19th, 2022 (*US Patent # 11,309,061 B1*)
- **Fahad Saeed**, and Muhammad Usman Tariq, “Systems and methods for measuring similarity between mass spectra and peptides”, United States Patent and Trademark Office (USPTO), U.S. Department of Commerce, February 15, 2022 (*US Patent # 11,251,031*)
- **Fahad Saeed**, and Muhammad Haseeb, “Methods and Systems for Compressing Data”, United States Patent and Trademark Office (USPTO), U.S. Department of Commerce, October 20, 2020 (*US Patent # 10,810,180*)

### 11.1 Provisional Patent Applications

- N/A

### 11.2 Invention Disclosures & Non-Provisional Patent Applications

- “GPU based database search for peptide identification from large-scale mass spectrometry data”, FIU Technology Management and Commercialization, Reference No. Disclosure D2023-0041
- “SPERTL: Epileptic Seizure Prediction using EEG with ResNets and Transfer Learning”, FIU Technology Management and Commercialization, Reference No. Disclosure D2022-0051
- “Systems and Methods for matching mass spectrometry data with a peptide database”, FIU Technology Management and Commercialization, Reference No. Disclosure 2021-077
- “ASD-SAENet: Sparse Autoencoder for detecting Autism Spectrum Disorder (ASD) using fMRI data”, FIU Technology Management and Commercialization, Reference No. Disclosure D2021-0015
- “SpeCollate: Deep Cross-Modal Similarity Network for Mass Spectrometry Data based Peptide Deductions”, FIU Technology Management and Commercialization, Reference No. Disclosure D2021-0010
- “HPC methods for peptide deduction on distributed memory architectures”, FIU Technology Management and Commercialization, Reference No. Disclosure D2020-0114, Oct 2020
- “Efficient Shared Peak Counting in Database Peptide Search Using Compact Data Structure for Fragment-Ion Index”, FIU Technology Management and Commercialization, Reference No. Disclosure D2019-0056, Oct 2019
- “A Deep-Learning and fMRI data based approach for diagnosis of Autism Spectrum Disorder”, FIU Technology Management and Commercialization, Reference No. Disclosure D2019-0044, Oct 2019

- “Dynamic programming algorithm for phosphorylation site assignment”, Office of Technology Transfer and Development at National Institutes of Health (NIH)
- “Multiple sequence alignment system for pyrosequencing reads”, Office of Technology Management at University of Illinois at Chicago, Reference No. DC091,
- “Sample-Align-D: A High Performance Multiple Sequence Alignment System using Phylogenetic Sampling and Domain Decomposition”, Office of Technology Management at University of Illinois at Chicago, Reference No. DC082

## **12 Regulatory Experience**

- Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration (FDA): “Early Epileptic Seizure Prediction Model for Wearable EEG”, Meeting minutes for pre-submission #Q230317, May 18th 2023 by AI-NeoTech LLC; PI Saeed
- Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration (FDA): “Early Epileptic Seizure Prediction Model for Wearable EEG”, Q230317, Feb 15th 2023 by AI-NeoTech LLC; PI Saeed

## **13 Continuing Professional Education**

- NSF Regional iCorps, NYC Cohort, Spring 2023
- NSF National iCorps, NYC Cohort, Fall 2022
- NSF Regional iCorps, UC Berkeley Cohort, Summer 2022
- Bystander Leadership workshop, FIU, 2019
- FIU Diversity Advocate Workshop, 2021
- STRIDE Training (Diversity and Inclusion) Workshop, 2021

## **14 Professional Membership**

- Institute of Electrical and Electronics Engineers (IEEE), since 2005
- Association for Computing Machinery (ACM), since 2010