

Potential research topics for Data Science Capstone Project mainly evolving around data analytics for smart city applications:

- 1- Data analytics for energy systems:
 - a) High resolution and accurate electric power demand prediction
 - b) Near-real-time generation prediction of stochastic renewable energy resources
 - c) Electricity market price forecast for optimal bidding strategy of generation aggregators

- 2- Data analytics for (electrified) transportation networks:
 - a) Spatiotemporal traffic data analysis to identify optimal pricing scheme for ride-sharing fleets
 - b) Anomaly detection by identifying abnormal trends in traffic data, i.e., leveraging the historical data to identify bad data injection in the traffic management system
 - c) Charging demand prediction of electric vehicles based on historical traffic data and charging patterns

- 3- Data analytics for water network:
 - a) Short-term and long-term water demand forecasting
 - b) Data analytics for anomaly detection leveraging historical water flow and online measurements

- 4- Data driven modeling and forecasting for power systems/ applicability of machine learning algorithms for modeling power systems:
 - a) Generative modeling from data using Boltzmann machines
 - b) SVM based methods such as Reproducing kernel Hilbert space (RKHS) methods
 - c) Bayesian inference

More details of each project will be available upon request. While for some projects required data is available, some other projects can be collected by reaching out to Miami-dade county agencies or other local institutions.

Please feel free to email me if you are interested in working on the above-mentioned topics as a part of your Data Science Capstone Project: amini@cs.fiu.edu Please include “IDC 6940: Capstone in Data Science” as your email subject.