DEPARTMENT OF THE NAVY

NAVAL RESEARCH LABORATORY
STENNIS SPACE CENTER, MISSISSIPPI 39529-5004

IN REPLY REFER TO

3910
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Dr. Bush Jones
Chair, Awards Committee
Department of Computer Science
Louisiana State University
Baton Rouge, LA 70803

Dear Dr. Jones:

This letter is to endorse the nomination of Prof. S.S. Iyengar for Distinguished Faculty Research Award. Professor Iyengar has been involved for several years in Navy funded research in the automated analysis and interpretation of satellite imagery of the ocean, a research area of considerable importance to the Navy. His work has been a key part of a larger effort involving Navy laboratories, industry, and several universities. He was selected an IEEE Fellow in January 1995 for his contributions in high performance algorithms and data structures for image processing applications.

Oceanographers possess high-level knowledge about currents, eddies, and other dynamic ocean features. Image processing techniques locate edges, uniform regions, or shapes in satellite imagery of the ocean. One of the major problems associated with automated image interpretation is bridging the gap between low-level image features and high-level oceanographic features. In other words, is a sharp gray level gradient in the image part of the Gulf Stream North Wall, part of an eddy, or part of some other meaningful ocean structure? This linkage of low-level features to oceanographic objects is the problem addressed by Prof. Iyengar's research. Without useful results in this key area, the work of other laboratories involved with this project could not have been integrated into a working prototype system.

Prof. Iyengar's use of non-linear probabilistic relaxation to perform feature labeling was innovative and well executed. His work was a key factor leading to the first fully automated interpretation of a satellite image of the ocean in 1989. Subsequent work has shown the method to produce labelings that are too dependent upon having a previous analysis. The method will hopefully be replaced by one of several alternate approaches, also under development in the Computer Sciences Department at LSU. However, for three years Prof. Iyengar's research served well as the centerpiece of this pioneering effort in computerized image analysis systems. He made a significant contribution to image analysis science and to the goals of the Naval Research Laboratory. In short, I strongly support Prof. Iyengar for a research award at LSU.

Sincerely,

RONALD J. HOLYER
Head, Computer Sciences Section