

# Acquisition of a NUMA-based Supercluster for High Performance Computing (Project Summary)

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Several federal government agencies and the State of Florida have recently invested a significant amount of resources in the creation of several earmark projects and a center of excellence at Florida Atlantic University (FAU). Many of the projects involve extensive computation that requires high performance computing. Existing computing facilities at FAU are no longer sufficient to meet the needs of these projects. As a result, a *Center for High Performance Computing* is being established, which is a collaborative enterprise among the Department of Computer Science and Engineering and five other PhD-granting departments from two Colleges of Engineering and Science: Biomedical Science, Chemistry, Electrical Engineering, Mathematics, Physics, and local industries.

This proposal requests funding to purchase and operate a NUMA-based supercluster that will complement current federal and state investments at FAU and help drive related research and educational activities.

**Intellectual Merits.** Two major synergistic research groups will work on this project: computer systems and scientific computing. The requested supercluster will service the following five areas: (1) *research*: faculty and students can use the Center to conduct research on high performance computing; (2) *development*: faculty and students can develop tools for parallel programming on the supercluster; (3) *service*: the Center offers service not only to other departments on campus, but to our local community, such as area high schools; (4) *education*: the Center provides a computing environment for various undergraduate and graduate science courses for students to gain hands-on experience; and (5) *collaboration*: the Center will conduct joint research with local industries to develop and test advanced tools for designing and executing parallel programs.

**Broader Impact.** South Florida, which includes the State's three largest counties Dade, Broward, and Palm Beach, is a growing metropolitan region with a diverse population of over 4 million, including the highest concentration of Hispanics in the United States. South Florida also has a high concentration of high-tech and IT-related industry, yet there is currently no high performance computing center able to provide vital services and facilitate collaboration among different sectors: higher education, K-12 education, government agencies, and local industry. The intent of the establishment of this center is to foster such collaboration by offering services in the five areas listed above.