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RPPR Final Report
as of 10-Jul-2018

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Final Report for Period Beginning 01-Sep-2016 and Ending 31-Aug-2017

Title: Instrumentation for the Computational and Engineering Sciences

Begin Performance Period: 01-Sep-2016

End Performance Period: 31-Aug-2017

Report Term: 0-Other

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RPPR Final Report

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STEM Degrees: 73

STEM Participants: 15

Major Goals: Building on exceptionally strong, complementary and closely interwoven research and extensive collaborations, the goals of this project were two-fold:

- i) upgrade to an existing computational infrastructure for the STEM disciplines and the Computing and Visual Systems laboratory at North Carolina Central University (NCCU) in support of research and educational activities in nationally recognized, computationally driven research programs across the following multiple areas: Development of novel nanomaterials and application of these materials in advanced optoelectronic devices; Low-to-medium-energy nuclear and hypernuclear few-body physics; Intelligent systems and robotics; Computational drug development; and Genomics research;
- ii) increase productivity and expansion of the ongoing research programs to facilitate NCCU's transformation into a research intensive university with established doctoral programs across STEM disciplines

Accomplishments: Through this award, a SGI UV300 computing platform was acquired. A 40-seat laboratory is equipped with Linux based PC's and a laboratory equipped with a gridiron platform with 5 cameras and 40 Swarm R-Ones swarm robot assembled from parts.

This acquisition of a high end computing infrastructure is beginning to impact the STEM departments, CREST, NASA-URC Centers, BRITE, and BBRI Institute. More than 25 faculty, 12 post doctorates and indirectly about 75 graduate and several undergraduate students in STEM who are directly involved in the high-end computations have access to further allow for more advanced research and creating of new opportunities, especially for young faculty and graduate students and their theses. The CREST Computational Center is already making a significant impact on the university undergraduate and graduate STEM academic programs and student and faculty development and its success is moving NCCU closer to its institutional goal of becoming a research intensive university

Training Opportunities: Several of our students cooperated with faculty during the installation of the UV-300 and the erection of a Vicon system designed by faculty and students using off-the-shelf equipment to enable video capture, video image processing, etc. for tasks such as large area exploration and data gathering, surveillance (e.g. of facilities, of crowds, of large human events), of autonomous ground, aerial and exploration vehicles, to be used in a variety of applications, such as 3-D reconstruction of large environments or tracking of mobile targets.
process.

Our Mathematics and Computing Sciences majors will have the opportunity for studies in Computational and Engineering Mathematics Concentrations (CEMA). These concentrations is designed to attract more students to the mathematics program and provide an applied sciences-focused curriculum that would prepare majors for jobs in the industry as well as graduate education. The CEMA concentration will provide a unique opportunity to students to pursue a discipline in computing and engineering which is geared towards marketability and skills based employment after graduation. This concentration is enabling us to recruit an entirely new group of students who aspire to be architects of real-world challenges in science and engineering

Results Dissemination: Nothing to Report

Honors and Awards: Nothing to Report

Protocol Activity Status:

Technology Transfer: Nothing to Report

CONFERENCE PAPERS:

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Authors: Derrick Swick, Jacqueline Bennett, R. N> Uma, Alade Tokuta

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North Carolina Central University
Instrumentation for the Computational and Engineering Sciences

Nothing to Report.