National Aeronautics and Space Administration

NASA's HBCU/MI Engagement Forum at Johnson C. Smith University

Fayetteville State University

Sambit Bhattacharya

www.nasa.gov

Dept. of Math & Computer Science (DMCSC) - Curriculum

- ABET accredited CS program (B.S.)
- BS in Mathematics
- BS in Mathematics with a Teaching Licensure concentration (Secondary Education 9-12)
- Engineering 3+2 Dual Degree Programs with North Carolina State University (CSC + CEng, CSC + EE, and Math + Civ Eng)
- Cisco CCNA certification curriculum
- Cybersecurity certification curriculum

DMCSC - Recently Funded Projects

- Implementation Project: Strengthening Student Success in STEM (S^4)
- Awarding Agency: National Science Foundation (NSF)
- Strategies:
  - Professional Seminar Course Sequence.
  - Assessment-Based Adaptive Math Course.
  - Student-Centered Active Learning Environment Upside-down Pedagogies (SCALE-UP)/Flipped Learning.
  - Intrusive Peer Tutoring and Supplementary Instruction.
  - Undergraduate Research Mentoring.
  - STEM Education Research.

- Strengthening Computer and Information Sciences Engagement and Learning (SCISEL)
- Awarding Agency: American Association of Colleges and University (AAC&U)
- Strategies:
  - improve the quality and quantity of graduates for STEM workforce
  - specifically,
    - re-designed courses to include culturally responsive teaching (CRT) initiatives
    - provide professional development for faculty in CRT
    - teaching & research to improve self-efficacy of students
  - project-based learning & research activities e.g. **in robotics, swarming**
  - **participation in the NASA Swarmathon** competition over several years

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DMCSC – Recently Funded Projects

- Title: Acquisition of a High Performance GPU Cluster and Sensing Equipment for Research and Education at Fayetteville State University in Areas of Interest to DoD
- Awarding Agency: US Department of Defense (DoD), Army Research Office (ARO)
- Title: Developing the Geospatial Intelligence Certificate at FSU
- Awarding Agency: National Geospatial-Intelligence Agency (NGA)
- Established GEOINT certification accredited by USGIF

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DMCSC – Intelligent Systems Lab

- Mission
  - develop intelligent and analytic tools that solve problems in
    - Cybersecurity
    - Robotics
    - AI, Data Science
  - provide an experimental environment for development, modeling and testing
- Provide support to faculty & students
  - HPC with GPUs
  - Robots & accessories (from previous NSF MRI grant, now NASA Swarmathon)
  - contracts from companies
  - financial support for students from the Collaborative Research Experiences for Undergraduates (CREU) program of the Computing Research Association (CRA)

DMCSC – current research projects

- Security of mobile communications, image transmissions and satellite phones with stream-based cryptographic algorithms and multicore distributed computing (GPUs)
- Protein model scoring
- Multi-modal deep learning, machine learning
- Joint understanding of language/text and image/video data
- Physical surveillance robotics with human partners
- Soft matters and biophysical fluid dynamics and various other projects in basic and applied mathematics research

DMCSC – Points of Contacts

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