Center of Excellence in Research and Education for Big Military Data Intelligence (CREDIT Center)

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Overview of CREDIT center

• The team: Drs. Lijun Qian (PI, ECE), John Fuller (ECE), Xiangfang Li (ECE), Pamela Obiomon (ECE), Lei Huang (CS), Yonggao Yang (CS), Lisa Hobson (CoEdu)

• Collaborator: Dr. Barbara Chapman (University of Houston/Stony Brook University)

• External Funding (OSD/AFRL): $5 million (2015-2020)

• Mission: accelerate research and education in predictive analytics for science and engineering to transform our ability to effectively address and solve many complex problems posed by big data; train next generation data scientists and engineers
Research Thrusts

- **Research Thrust 1 (Lead: Huang, Chapman, Qian):**
  - System architecture design for a military cloud computing system;
- **Research Thrust 2 (Lead: Qian, Li, Huang):**
  - Secure and robust data aggregation using cognitive radio sensor network;
- **Research Thrust 3 (Lead: Qian, Fuller):**
  - Novel machine learning algorithms designed for high-dimensional dataset with missing data;
- **Research Thrust 4 (Lead: Yang, Huang, Obiomon):**
  - Visualization of massive military datasets interactively on big screen and portable devices.
- Validation by simulation experiments and test bed
PVAMU Cloud Facility

• Cloud Computing Lab established since 2011 at PVAMU
  – 24 SMP nodes with 12 cores, 128GB memory each (4 GPU nodes)
  – 8 SMP nodes with 16 cores, 128GB memory each
  – 4 SMP nodes with 32 cores, 64GB memory each
  – 54 IBM blade servers with 4 cores, 4GB memory each

• Funded by multiple NSF programs
• Submitted an equipment proposal to DOD in November 2015 to improve the existing PVAMU cloud facility
Sample Education Activities

• **Curriculum Development**
  – New courses: COMP 5285 “*Machine Learning*” created and submitted for approval, and more to come
  – Modernize existing courses: ELEG 6123 “*The Internet: Design and Implementation*” with new components and course projects incorporating big data in future Internet design

• **Engaging students in research**
  – 3 Senior Design projects (2 groups in ECE, 1 group in CS)
  – 10 undergraduate student workers and 2 seniors in the 5-year BS-MS Program
  – 12 MS Graduate Research Assistants and 5 PhD Graduate Research Assistants
  – Graduate students participated and presented their research works in various conferences, symposium and workshops
  – Potential Internship opportunities for students to work with DOD Labs
Thanks!

- Questions?