



Prairie View A&M University Capability Statement

Institution	Prairie View A&M University, Prairie View, TX 77446
DUNS No	138170220
Cage Code	1QPCO
NACIS ID	611310 561621 236220 221310 541715 541310, 237130
SIC	8221
Federal EIN No	74-6001078
Certificates, Registrations, Accreditations	SACSCOC; CSWE; ADA; NAAB; ACS; AACSB; NCATE; SBEC; CSAC of ABET; EAC of ABET; TAC of ABET; ACEN; CCNE; BON

POC INFORMATION

Dr. Magesh Rajan, Vice President for Research & Innovation; Prairie View A&M University. Address: 700 University Drive, Prairie View, TX 77446; Tel: (936) 261-1570; email: mtrajan@pvamu.edu

OVERVIEW

Established in 1876, Prairie View A&M University (PVAMU), a member of the Texas A&M University System, is the second oldest public university and a land-grant institution in Texas. It offers 36 baccalaureate degrees, 30 master's degree and 5 doctoral degree. PVAMU has an enrollment of about 9,893 students and a 18: 1 student to faculty ratio. Its total research expenditure in FY 2024 is about \$34 M.

RESEARCH CAPABILITIES

A. ENGINEERING

Research Areas: Big data and high performance computing, cybersecurity in communication, social networking and virtual environments, secure imaging, AI in cybersecurity, transport processes on porous surfaces, smart grid electromagnetic compatibility and security, multi-dimensional heat transfer in flow channels, lightweight structural composites and matrix resins for thermal stability, biosensors, bionanocomposite materials, self-healing nano-metal complexes, biofuels, wind energy.

Facilities: PVAMU has 12 state-of-the-art engineering research centers. Several of the research centers have achieved national recognition. Researchers associated with these

centers have published papers in peer-reviewed journals and conferences at both national and international levels. Importantly, the centers have successfully secured funding from esteemed entities such as **NSF, NIH, DOD, DOE, NASA, Apple, Google, IBM, and Chevron**, showcasing the significant impact and relevance of PVAMU's research endeavors.

1. The Center of Excellence in Research and Education for Big Military Data Intelligence (CREDIT)
2. Center of Excellence for Cyber security (SECURE)
3. The Smart MicroGrid Advanced Research and Technology Center (SMART)
4. The Center for Computational Systems Biology (CCSB@PVAMU)
5. Center for High Pressure Combustion in Microgravity
6. The Center for Energy and Environmental Sustainability (CEES)
7. The Center of Excellence for Communication Systems Technology Research (CECSTR)
8. The Center for Radiation Engineering and Science for Space Exploration (CRESSE)
9. The Future Aerospace, Science and Technology (FAST)
10. The Texas Gulf Coast Environmental Data (TEXGED)
11. The Thermal Science Research Center (TSRC)
12. The National Transportation Research Center (National Center for Infrastructure Transformation)

INITIATIVES INVESTING IN THE SEMICONDUCTOR INDUSTRY “CHIPS”

1. **Apple New Silicon Initiative:** VLSI Design and Fabrication: The Apple New Silicon Initiative at Prairie View A&M University aims to cultivate VLSI design and fabrication talent. Developed in partnership with Apple, the program introduces students to chip design concepts early in their academic journey, equips them with essential skills for next-generation chip development, and provides a supportive ecosystem including lab facilities, guest lectures, and mentorship. The curriculum, co-created with Apple experts, ensures alignment with industry standards. Faculty receive training to integrate industry-relevant content into courses. A vibrant Computer Hardware and VLSI Design club promotes collaboration and innovation. The initiative empowers students with hands-on experience, internships, and scholarships. Through this comprehensive approach, the initiative prepares a diverse cohort of future innovators poised to shape the technological landscape.
2. **Quantum and Nanomaterials and Devices:** The Quantum-aware Complexvalued Neural Networks Design and Implementation project stands at the forefront of cutting-edge research, poised to revolutionize the intersection of quantum computing and artificial intelligence. Supported by the prestigious IBMHBCU Quantum Center, this ambitious initiative embodies a holistic approach, intertwining advanced research, curriculum development, and community outreach to propel innovation and foster inclusivity in the scientific landscape. At its core, the project delves into the realm of complex-valued neural networks, leveraging the inherent capabilities of quantum computing to transcend the limitations of classical

computing paradigms. By harnessing the principles of quantum mechanics, researchers aim to engineer neural networks capable of processing and analyzing complex-valued data with unprecedented efficiency and accuracy.

- 3. Hardware Security: The Quantum Information Science and Engineering Research (QISE) Program:** The Quantum Information Science and Engineering Research (QISE) Program, led by Prairie View A&M University (PVAMU) in collaboration with Virginia Tech, focuses on quantum communications and cryptography. PVAMU leads the establishment of Quantum Optics and Quantum Key Distribution testbeds. The program enhances PVAMU's workforce development through curriculum development, student and faculty research, and professional development opportunities. IBM, an industry partner, contributes to research on Hardware Security. This interdisciplinary initiative empowers students and faculty to explore cutting-edge quantum technologies while fostering collaboration between academia and industry to address challenges in quantum information science and engineering.

B. AGRICULTURE

Research Areas: Water and food security, mammalian embryo technologies, soil moisture sensors, neural network and thermal images for soil moisture estimation, immunoassay analyzer, core microscopy

Facilities: The Cooperative Agricultural Research Center (CARC) is the research arm of the College of Agriculture, Food, and Natural Resources (CAFNR). The research program is consisted of six systems: Animal Systems, Plant Systems, Food and Nutrition Systems, Natural Resources and Environmental Systems, Social Systems and Allied Research, and Artificial Intelligence. The research programs also include the following centers.

1. International Goat Research Center (IGRC)
2. Food Security Research Center (FSRC)
3. Poultry Center
4. Meat Science Center
5. Algae Center in the Gov. Bill and Vara Daniel Farm and Ranch.

C. PHYSICS

Research Areas: Radiation biology, computational modeling, protons and heavy ions in cancer therapy, space radiation effects on electronic devices, designing of shielding materials, particle pixel detector, dosimetry.

Facilities:

1. Physics I Instructional Laboratory
2. Physics II Instructional Laboratory
3. Physics Student Learning Lab
4. Computational Physics Lab

5. Physical and Earth Science Laboratory
6. Advanced Materials Laboratory
7. CRI/Radiation Institute for Science and Engineering (RaISE)
8. Radiation and Medical Imaging Laboratory
9. Prairie View Solar Observatory
10. High Magnetic Field Laboratory
11. NanoX Laboratory

D. CHEMISTRY

Research Areas: Nanomaterials for anti-cancer drugs, metal nanoparticles, graphene, quantum mechanical calculations, charged nano-layers, nanodisks, biomass conversion, renewable polymers.

E. BIOLOGY

Research Areas: Functional genomics, stochastic modeling and analysis for biological systems, evidence networks for drug-mediator relationships, early detection of cancer.

F. MATHEMATICS

Research Areas: Signal processing, probability of success and failure of the lifting and landing.

G. PUBLIC HEALTH

Research Areas: Substance use, mental health, juvenile offenses, social biases