Cover page (maximum 1 page)

Application Title: Interdisciplinary Advanced Robotics Facility

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Key Participating Units:

- **College of Engineering:** Aerospace, Biomedical, Computer Science, Civil, Electrical, Engineering Technology & Industrial Distribution, Industrial & Systems Engineering, Ocean, Mechanical, Nuclear;
- **College of Agriculture & Life Sciences**: Biological & Agricultural;
- **College of Education & Human Development:** Health & Kinesiology;
- **College of Geosciences**: Oceanography, Atmospheric Sciences;
- **College of Liberal Arts:** Psychology;
- **Centers**: Center for Infrastructure Renewal; Geochemical and Environmental Research Group (GERG); Institute for Manufacturing Systems; National Center for Therapeutics Manufacturing.

Anticipated Request Amount ($): $1,450,000

Executive summary of the intended application to utilize Research Development Funds: The goal is to establish a shared, interdisciplinary *Advanced Robotics Facility* (ARF) by a team of investigators from several colleges at TAMU with robotics related activities; requested funds will be utilized for procuring several industrial size rigid and mobile robots and robotic devices that can be easily employed in a variety of applications and easily repurposed to adapt to new applications. The ARF will be initially housed in a 4,000 SFT Lab Space in the Von Gonten Building; the long term plans are to move to the currently planned new Industry Building at the RELLIS campus which will host the ARF together with the Autonomy and other laboratories. *The ARF significantly*: (1) advances research capacity in robotics and automation by a number of researchers across different colleges at TAMU by providing a common state-of-the-art facility for TAMU researchers and industry visitors to work on interdisciplinary research and development projects; (2) positions TAMU researchers to attract substantial government and industrial funding since significant growth of robotics solutions are envisioned in a variety of industrial and service sectors; and (3) facilitates robotics education and training programs by creating short courses and curriculum modules and by nurturing an ecosystem for collaboration between TAMU researchers and practicing engineers.

Robotics research is widespread across various units in TAMU with applications in all segments of manufacturing, industrial automation, biomedical devices, rehabilitation, search and rescue, ocean exploration, etc. Although robotics research and development is active in various labs, activities are fragmented, thus curtailing the ability to engage in large funded programs. The ARF with broad state-of-the-art robotics equipment will fill this gap by substantially advancing robotics research infrastructure at TAMU and providing significant visibility to TAMU in Texas and Nationally. The facility will also significantly complement TAMU's recent focus in the areas of autonomous vehicles and cybersecurity systems. The ARF will be developed by the Co-PI in close collaboration with the Co-PIs (one from each college listed above).

The facility will significantly enhance cross-disciplinary collaborative research which will enable us to tap into activities and near term funding from two recent opportunities: the *Advanced Robotics Manufacturing (ARM) institute* and the newly formed division of the Army Research Lab (ARL) in Texas, *ARL South*. TAMU Engineering has recently partnered with CMU on a successful DoD proposal to the Manufacturing USA initiative for the creation of the ARM institute. TAMU will lead the ARM institute's *South Central Regional Robotics Innovation Collaborative* (RRIC) whose goal is to identify industry needs and facilitate partnerships between academic researchers and industries to simplify and tackle complex robotics related problems and provide meaningful industry specific robotics solutions. The ARF will be a key driver for many of the RRIC activities in our region by providing shared infrastructure, facilities, and technology assistance for robotics research for manufacturing and industrial automation.