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 ($): $985,000

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. Plans are underway for a new building at the RELLIS campus which will host the ARF together with other engineering laboratories. *The facility significantly*: (1) enhances ongoing research in robotics and automation in a number of laboratories 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 there is substantial use of robotics technologies by various labs and researchers, research and development 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 improving 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.

In addition to a number of broad robotics activities throughout the university, this facility will directly enable us to tap into activities and 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; with a total budget of ~$250M, the institute will fund industry-relevant research and development projects and develop education and training programs in robotics. As part of the ARM institute, TAMU will lead the *South Central Regional Robotics Innovation Collaborative* (RRIC). The goal of the collaborative 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 sustained growth of robotics in manufacturing and industrial automation.