Application Title: CPR: A Cyber-Physical Range for Cross-Disciplinary University-Industry Experimentation in Cybersecurity

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Team and Key Participating Units
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Colleges: Bush School, Business School, College of Engineering, Law School

RDF Amount Requested ($): $1,507,116.00

Executive Summary

The proliferation of cybercrime manifests as an urgent, escalating global crisis with economic ramifications extending into the hundreds of billions of dollars as of 2020. This alarming trajectory has catalyzed an urgent, multi-sectoral effort to bolster both the human capital and technological acumen needed to counteract this multifaceted menace. Notably, the challenge transcends mere technical competence, implicating a complex nexus of workforce shortfalls, technological limitations, and insufficient policy innovation. A significant obstacle in counteracting cybercrime lies in its far-reaching impact beyond the digital realm; it disrupts various interlinked physical and socio-economic sectors ranging from energy and finance to healthcare and national defense. Consequently, it morphs from a singular "information security" issue into a broader "information-to-action" security dilemma that demands integrative solutions across diverse disciplines and institutions.

The rapidly evolving landscape of cyber threats necessitates a relentless commitment to innovation in defense mechanisms. Situated advantageously in this context, Texas A&M University is primed to lead interdisciplinary educational and research endeavors in cybersecurity. The institution's comprehensive academic programs span core cyber sciences and extend to engineering, business, and law, thus fostering a multi-disciplinary approach that is critically poised to influence regional and state-level industrial sectors.

The recently established Global Cyber Research Institute (GCRI) serves as the nexus for these multidisciplinary cybersecurity initiatives. The Institute is committed to formulating a holistic strategy focusing on national defense, public and individual safety, and the stability of essential infrastructures. Hence, Texas A&M stands uniquely equipped to navigate the intricate web of contemporary cyber challenges.

The purpose of this RDF proposal is to request strategic **investment in the *experimental capabilities*** needed for Texas A&M university, and regional and national industry, to become leaders in **information-to-action-centered cybersecurity.** Specifically, we propose a **new concept – a distributed "Cyber-Physical Range (CPR)"** with nodes across the Texas A&M campus, which is used by faculty/students and also regional industry, for research, training and innovation in cybersecurity. This experimental equipment infrastructure will serve as a multi-disciplinary platform leveraged by faculty, students, and industries for the advancement of research, skills training, and innovation in the realm of cybersecurity. Specifically, the funding sought for this initiative is anticipated to generate several pivotal outcomes such as elevating TAMU status as a leader in the field. In terms of broad campus benefit, this investment underpins Texas A&M's research infrastructure by providing a unified, state-of-the-art experimental platform that can be utilized across multiple disciplines. This interdepartmental utility encourages cross-collaborative initiatives and helps to maximize the efficiency and impact of research efforts. Therefore, the Cyber-Physical Range (CPR) not only serves the specialized needs of cybersecurity research but also acts as a catalyst for multidisciplinary research, innovation and sustained external funding.