Research Development Fund – Cover Page Template

Application Title: Development of a Next Generation Virtual Reality Lab for Innovative Research of Tomorrow

Lead contact for RDF Application:

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Key Participating Units:

- College of Engineering (Civil, Biomedical, Aerospace, Mechanical, Chemical, Petroleum, Industrial Engineering, Computer Science and Material Science, The Bush School of Government and Public Service and Texas A&M Transportation Institute

Anticipated Request Amount ($): $1,435,545

Executive Summary

We propose herein to develop a state-of-the-art 3D/4D Virtual Reality Innovation Laboratory (VRIL). This laboratory will be available to all faculty and staff within the TAMU System, with the primary motives of driving innovation in our research capabilities across a broad range of scientific and engineering disciplines and expanding our ability to provide leading-edge educational facilities. It is becoming increasingly apparent that high-end visualization capabilities not only improve our understanding of complex physical phenomena, these computer-intensive emerging technologies are actually essential to expanding our knowledge in a broad range of scientific, engineering, and technological fields. As such, the VRIL will act as a germination point for concept development and expansion across the TAMU, supporting a wide range of new research and innovation. Some of the innovative technologies that will be germinated from the VRIL include: Simulated Autonomous Reality; Virtual 3-D Printing & Prototyping; Advanced Manufacturing; and Emerging Technologies. The new VRIL will also enable new innovation in education and workforce development through cross-campus collaboration on new courses. The wider impact of this investment will help accelerate the modernization of our nation's infrastructure, which will require interdisciplinary research teams with state-of-the-art research facilities, 21st century technologies and materials, and innovative solutions to meet the demands of a growing population. Infrastructure requires significant financial investment and a long development and implementation time horizon. Consequently, it is important that all engineering, environmental, financial, and societal risks of infrastructure innovations be thoroughly understood. This requires that these innovations be systematically simulated, tested and demonstrated under a variety of conditions defined by their application. The VRIL will bring together the facilities and expertise needed for innovative studies to mitigate these risks and reduce additional startup costs. It will also provide technical assessments and decision theatre support in a virtual environment in order to introduce the tested innovations to larger circles within the industry. This research and technology transfer activity will be provided to address the technical demonstration and scalability assessment of strategically selected infrastructure innovations. A virtual reality facility is essential to the development of new ideas in a risk adverse economy. In order to realize the extraordinary benefits of this complex and expensive technology, it is financially necessary for such a facility to be centralized within the vast TAMU System. As a serendipitous outcome, deploying the VRIL in a single location will serve to bring together far-thinking entities within Texas A&M, thereby further enhancing the growth of TAMU's research.