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| Project | **Interfacing Cyber and Physical World Working Group**  <<https://sagroups.ieee.org/2888/> **>** |
| Title | **Propose to new PAR of the ‘****Large Space Virtual Reality Disaster Response Training System’** |
| DCN | **2888-20-0020-03-0000** |
| Date Submitted | **July 20, 2020** |
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| Re: |  |
| Abstract | This document is written in the form of the context required for the proposal of a new PAR. |
| Purpose | This document was submitted to propose a new PAR. |
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**PAR for a New IEEE Standard**

# Section 1

* 1. **Assigned Project Number**:

P2888.4

* 1. **Type of Document: *Standard, Recommended Practice, or Guide***

Standard

* 1. **Life Cycle: *Full Use or Trial Use***

Full Use.

# Section 2

**2.1 Project Title:**

Reference Architecture for Virtual Reality Disaster Response Training System in Large Space

# Section 3

**3.1 Working Group: Interfacing cyber and physical world**

**3.2 Sponsoring Society and Committee:** C/SAB

[A listing of Sponsor P&Ps and Sponsor Scopes is available at <https://development.standards.ieee.org/pub/view-sponsor-pnps>]

**3.3 Joint Sponsor:** (chosen from drop down menu)

If you are not adding a joint sponsor to this project, you may leave this field blank.

# Section 4

**4.1 Sponsor Balloting Information: *Individual or Entity***

Individual

**4.2 Expected Date of Submission of Draft to the IEEE-SA for Initial Sponsor Ballot**

**Month: Dec. Year: 2022**

**4.3 Projected Completion Date for Submittal to RevCom**

**Month: Oct. Year: 2023**

# Section 5

**5.1 Approximate number of people expected to be actively involved in the development of this project:**

30

**5.2 Scope of the proposed standard:**

This standard defines the reference architecture needed to implement a virtual reality training system that can simulate responses to possible disasters in large physical spaces. This reference architecture should include the physical-to-virtual component that transfers sensor data in the large space to the virtual world, the virtual-to-virtual component that conveys the data between virtual world objects, and the virtual-to-physical component that transfers the simulated responses in the virtual world to actuators in the physical world.

**5.3 Is the completion of this standard contingent upon the completion of another standard? No**

**5.4 Will this document contain a Purpose clause? No**

**5.5 Need for the project:**

So far, virtual reality-based training systems have had limitations in perfectly transferring real experiences into virtual reality. Significant national, economic and social losses from recent disasters have been caused by improper disaster response. In order to reproduce a disaster situation that is difficult to realize in reality, a "disaster response virtual training system in large space" is required. The digital twin in a disaster situation detects the physical amount of the user's or object's location, speed, and acceleration in the real world and tracks their movements and postures. The system then reflects and coordinates the movement and posture of the virtual world objects. It is also important to synchronize the sensorial effects in the virtual world (e.g., visual and auditory effects) and physical sensorial effects (e.g., tactile and olfactory effects) simultaneously. As there is no architecture standard for realizing such a disaster response virtual training system for large space, so the manufacturers rely on the proprietary system architectures and specifications provided by individual service providers. The reference architecture of the disaster response virtual training system for large spaces can lead to the development of industries related to the virtual training system, and is expected to contribute to disaster preparedness and public safety through effective disaster response training.

**5.6 Stakeholders for the standard:**

Local Governments, Mid-to-Large size companies, Safety related organizations, etc.

# Section 6

**6.1 Intellectual Property:**

**A. Is the Sponsor aware of any copyright permissions needed for this project? *No***

**B. Is the Sponsor aware of possible registration activity related to this project? *No***

# Section 7

**7.1 Are there other standards or projects with a similar scope? *No***

**7.2 Joint Development - Is it the intent to develop this document jointly with another organization? *No***

**7.3 International Standards Activities**

**A. Adoptions - Is there potential for this standard to be adopted by another organization?: *No***

**B. Harmonization - Are you aware of another organization that may be interested in portions of this document in their standardization development efforts? No**

**7.4 Does the sponsor foresee a longer term need for testing and/or certification services to assure conformity to the standard? *Yes***

**Additionally, is it anticipated that testing methodologies will be specified in the standard to assure consistency in evaluating conformance to the criteria specified in the standard? *No***

# Section 8

**8.1 Additional Explanatory Notes:**

**8.2 IEEE Code of Ethics**

**I acknowledge that I have read and I understand the** [**IEEE Code of Ethics**](http://www.ieee.org/portal/pages/iportals/aboutus/ethics/code.html)

**I agree to conduct myself in a manner that adheres to the IEEE Code of Ethics when engaged in official IEEE business.**