

Persistent Computing for Metaverse Initiative Industry Connections Activity Initiation Document (ICAID)

Version: 1.0, 29 August 2022

IC22-012-01 Approved by the CAG 12 October 2022

Instructions

- Instructions on how to fill out this form are shown in red. Please leave the instructions in the final document and simply add the requested information where indicated.
- Spell out each acronym the first time it is used. For example, “United Nations (UN).”
- Shaded Text indicates a placeholder that should be replaced with information specific to this ICAID, and the shading removed.
- Completed forms, in Word format, or any questions should be sent to the IEEE Standards Association (IEEE SA) Industry Connections Committee (ICCom) Administrator at the following address: industryconnections@ieee.org.
- The version number above, along with the date, may be used by the submitter to distinguish successive updates of this document. A separate, unique Industry Connections (IC) Activity Number will be assigned when the document is submitted to the ICCom Administrator.

1. Contact

Provide the name and contact information of the primary contact person for this IC activity. Affiliation is any entity that provides the person financial or other substantive support, for which the person may feel an obligation. If necessary, a second/alternate contact person’s information may also be provided.

Name: Yu Yuan

Email Address: y.yuan@ieee.org

Employer: OXSenses

Affiliation: OXSenses; VerseMaker

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

2. Participation and Voting Model

Specify whether this activity will be entity-based (participants are entities, which may have multiple representatives, one-entity-one-vote), or individual-based (participants represent themselves, one-person-one-vote).

Individual-Based

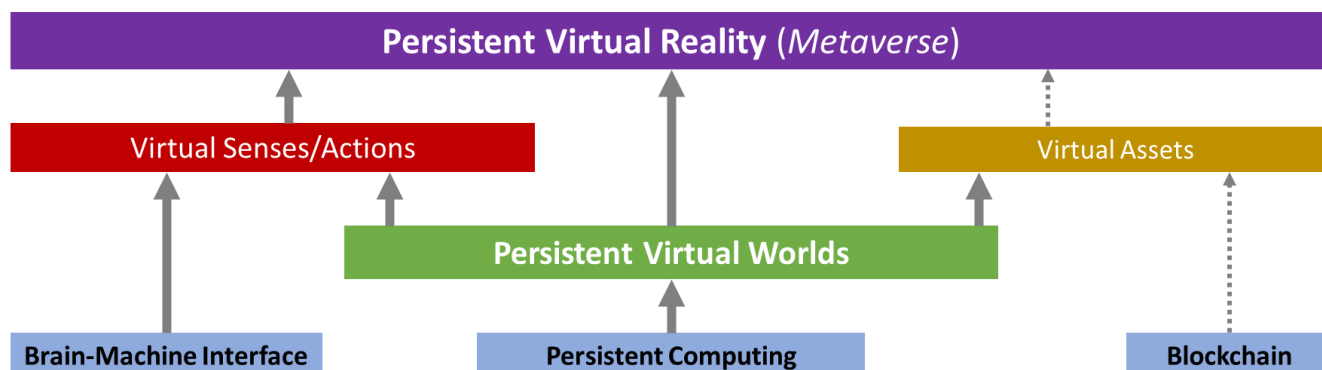
3. Purpose

3.1 Motivation and Goal

Briefly explain the context and motivation for starting this IC activity, and the overall purpose or goal to be accomplished.

Metaverse refers to a kind of experience in which the outside world is perceived by the users (human or non-human) as being a universe that is built upon digital technologies as a different universe ("Virtual Reality"), a digital extension of our current universe ("Augmented Reality"), or a digital counterpart of our current universe ("Digital Twin"). Named after the universe, a metaverse shall be persistent and should be massive, comprehensive, immersive, and self-consistent. Described as "meta", a metaverse should be ultra-realistic, accessible, pervasive, and may be decentralized. In a narrow sense, metaverse may be simply defined as Persistent Virtual Reality (PVR). In a broad sense, metaverse is the advanced stage and long-term vision of Digital Transformation.

Persistent Computing refers to technologies needed to design, build, operate, and upgrade Persistent Virtual Worlds (PVW), including but not limited to computation, storage, communications, data, intelligence, and other enabling technologies.



It is generally agreed that metaverse will have a profound impact on our daily work, play, and life, across all industries and sectors, reshaping the economy and society for all humankind. However, from the technical perspective, there are grand challenges in creating a true metaverse. One is how to build a persistent, large-scale, fine-grained, and physically self-consistent virtual world. The breakthrough in this direction depends on the continuous progress in computation, storage, communications, modeling, rendering, and other technologies.

The motivation of this initiative is to facilitate discussions and collaborations on Persistent Computing, steer and advise on metaverse research and development, and provide technical guidelines and reference implementations for persistent virtual worlds and metaverses.

The goal of this initiative is to enable and promote the persistent computing infrastructure for metaverses.

3.2 Related Work

Provide a brief comparison of this activity to existing, related efforts or standards of which you are aware (industry associations, consortia, standardization activities, etc.).

This activity is supplemental to the efforts related to metaverse, extended reality, and blockchain under other IC Activities, Working Groups, Standards Committees, and IEEE Future Directions.

Related work also includes the Metaverse Standards Forum (<https://metaverse-standards.org/>) of which IEEE is a member.

3.3 Previously Published Material

Provide a list of any known previously published material intended for inclusion in the proposed deliverables of this activity.

None.

3.4 Potential Markets Served

Indicate the main beneficiaries of this work, and what the potential impact might be.

It is generally agreed that metaverse will have a profound impact on our daily work, play, and life, across all industries and sectors, reshaping the economy and society for all humankind. This work will serve and benefit all the markets where metaverse can reduce cost, improve productivity, enhance user experience, enable new business models, or drive other positive transformations.

3.5 How will the activity benefit the IEEE, society, or humanity?

Describe how this activity will benefit the IEEE, society, or humanity.

This activity will proactively support IEEE standards development for metaverse, extended reality, blockchain, and other relevant technologies. It will help IEEE and IEEE SA establish or enhance leadership in relevant industry sectors. It will also help IEEE and IEEE SA grow membership and influence globally.

It is generally agreed that metaverse will have a profound impact on our daily work, play, and life, across all industries and sectors, reshaping the economy and society for all humankind.

4. Estimated Timeframe

Indicate approximately how long you expect this activity to operate to achieve its proposed results (e.g., time to completion of all deliverables).

Expected Completion Date: 09/2024

IC activities are chartered for two years at a time. Activities are eligible for extension upon request and review by ICom and the responsible committee of the IEEE SA Board of Governors. Should an extension be required, please notify the ICom Administrator prior to the two-year mark.

5. Proposed Deliverables

Outline the anticipated deliverables and output from this IC activity, such as documents (e.g., white papers, reports), proposals for standards, conferences and workshops, databases, computer code, etc., and indicate the expected timeframe for each.

- a. Documents (e.g., white papers, reports)
- b. Proposals for standards
- c. Workshops, webinars, and other events
- d. Reference implementations based on open-source development
- e. Conformity programs, certification authorities, and license trademarks

5.1 Open Source Software Development

Indicate whether this IC Activity will develop or incorporate open source software in the deliverables. All contributions of open source software for use in Industry Connections activities shall be accompanied by an approved IEEE Contributor License Agreement (CLA) appropriate for the open source license under which the Work Product will be made available. CLAs, once accepted, are irrevocable. Industry Connections Activities shall comply with the IEEE SA open source policies and procedures and use the IEEE SA open source platform for development of open source software. Information on IEEE SA Open can be found at <https://saopen.ieee.org/>.

Will the activity develop or incorporate open source software (either normatively or informatively) in the deliverables? Yes

6. Funding Requirements

Outline any contracted services or other expenses that are currently anticipated, beyond the basic support services provided to all IC activities. Indicate how those funds are expected to be obtained (e.g., through participant fees, sponsorships, government, or other grants, etc.). Activities needing substantial funding may require additional reviews and approvals beyond ICom.

Anticipated expenses include but are not limited to marketing, legal, finance, travel, public events, group meetings, and other general and administrative overhead. Funds are expected to come from external sponsorship, donations, and grants.

7. Management and Procedures

7.1 Activity Oversight Committee

Indicate whether an IEEE Standards Committee or Standards Development Working Group has agreed to oversee this activity and its procedures.

Has an IEEE Standards Committee or Standards Development Working Group agreed to oversee this activity? No

If yes, indicate the IEEE committee's name and its chair's contact information.

IEEE Committee Name: Committee Name

Chair's Name: Full Name

Chair's Email Address: who@where

Additional IEEE committee information, if any. Please indicate if you are including a letter of support from the IEEE Committee that will oversee this activity.

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

7.2 Activity Management

If no Activity Oversight Committee has been identified in 7.1 above, indicate how this activity will manage itself on a day-to-day basis (e.g., executive committee, officers, etc.).

- a. Executive Committee
- b. Subgroups
- c. Community

7.3 Procedures

Indicate what documented procedures will be used to guide the operations of this activity; either (a) modified baseline *Industry Connections Activity Policies and Procedures* ([entity](#), [individual](#)), (b) *Abridged Industry Connections Activity Policies and Procedures* ([entity](#), [individual](#)), (c) Standards Committee policies and procedures accepted by the IEEE SA Standards Board, or (d) Working Group policies and procedures accepted by the Working Group's Standards Committee. If option (a) is chosen, then ICom review and approval of the P&P is required. If option (c) or (d) is chosen, then ICom approval of the use of the P&P is required.

(a) modified baseline *Industry Connections Activity Policies and Procedures*

8. Participants

8.1 Stakeholder Communities

Indicate the stakeholder communities (the types of companies or other entities, or the different groups of individuals) that are expected to be interested in this IC activity and will be invited to participate.

Individuals that are involved with metaverse technologies and/or engaged in the metaverse industry.

8.2 Expected Number of Participants

Indicate the approximate number of entities (if entity-based) or individuals (if individual-based) expected to be actively involved in this activity.

100

8.3 Initial Participants

Provide a few of the entities or individuals that will be participating from the outset. It is recommended there be at least three initial participants for an entity-based activity, or five initial participants (each with a different affiliation) for an individual-based activity.

Use the following table for an entity-based activity:

Entity Name	Primary Contact Name	Additional Representatives

Use the following table for an individual-based activity:

Individual Name	Employer	Affiliation
Yu Yuan	0xSenses	0xSenses; VerseMaker
Steve Mann	University of Toronto	University of Toronto
Tom Furness	University of Washington	University of Washington
Philip Rosedale	Linden Lab; High Fidelity	Linden Lab; High Fidelity
Neil Trevett	NVIDIA	Metaverse Standards Forum; Khronos Group
Rev Lebedarian	NVIDIA	NVIDIA
Danny Lange	Unity	Unity
Evelyn Miralles	Aegis Aerospace Inc.	Aegis Aerospace Inc.
Ori Inbar	Augmented World Expo	Augmented World Expo
Michelle Zhou	Juji, Inc.	Juji, Inc.
Lee Stogner	Vincula Group	Vincula Group
Ramesh Ramadoss	New Caribbean Ventures LLC	New Caribbean Ventures LLC
Stephen Dukes	Dreamerse	Dreamerse
Tom Coughlin	Coughlin Associates	Coughlin Associates

8.4 Activity Supporter/Partner

Indicate whether an IEEE committee (including IEEE Societies and Technical Councils), other than the Oversight Committee, has agreed to participate or support this activity. Support may include, but is not limited to, financial support, marketing support and other ways to help the Activity complete its deliverables.

Has an IEEE Committee, other than the Oversight Committee, agreed to support this activity? No

If yes, indicate the IEEE committee's name and its chair's contact information.

IEEE Committee Name: Committee Name

Chair's Name: Full Name

Chair's Email Address: who@where

Please indicate if you are including a letter of support from the IEEE Committee.