

PANEL PROPOSAL A Grand Challenge for Presence

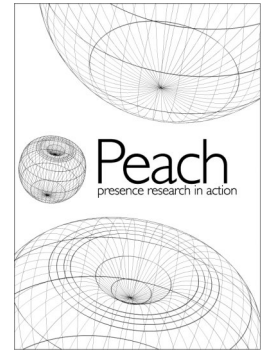
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Abstract

Although many interesting research lines in Presence are presently being pursued, it is apparent that it would be beneficial for the field today to focus community efforts on a Grand Challenge in core science and technology of Presence. Presence research lies at the intersection of human perception and cognition research, machine intelligence, and human-machine intelligence, and as such it needs contributions from a wide variety of fields. Presence studies how the human brain constructs the model of reality and self through replacement/augmentation of sensorial data and interaction (VR and beyond). The goal of the field is to develop science and technology to achieve successful replacement/interaction (i.e., presence, being there) and open up a wide range of powerful applications. This panel will discuss and propose ideas for a Grand Challenge project for Presence with a 5 to 10 year horizon, to reach a consensus on the key objectives and questions addressed by Presence.

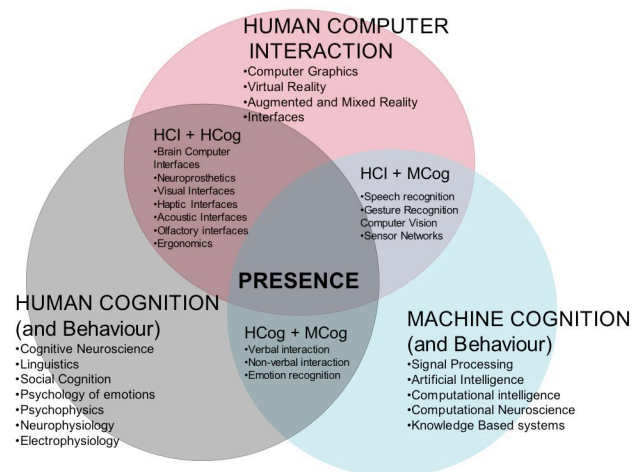
1. Introduction

PEACH (Presence Research in Action) is a coordination action on Presence. The project's main objective is to stimulate structure and support the Presence research community, with special attention to the challenges associated to the interdisciplinary character of the field, and to produce visions and roadmaps to support the construction of the Presence ERA. One early but important conclusion in PEACH is that there is a clear need for unification of efforts in this multidisciplinary field around a challenging and visionary project centered on the main goals of Presence Science and Technology (the core of Presence). Such a project could bring together several communities working

today in the field, and should have a time scale of around 5 to 10 years.

PEACH is therefore conducting during its second year a pro-active consultation within the Presence research community with the goal of establishing a consensus on the **key objectives and questions addressed by Presence**. The possibility of setting boundary conditions within the large spectrum of applications and theories related to Presence is sought. A possible method to approach this task is the definition of a Grand Challenge for Presence. Such a project would create a focus for the work and perhaps an objective and measurable target for the Presence community. The setting of this target would facilitate the creation of the boundary conditions.

The starting point for the discussion is a set of requirements for such a Grand Challenge for Presence.



Requirements for a Grand Challenge Project in Presence

Basic requirements

- Such a project should be at core of Presence: producing "real" experiences through sensorial replacement and interaction with "bits"
- Should be ambitious, hard, medium to long term (~10 year horizon with 3 yr milestones say)
- Should engage the needed communities in Human Cognition, HMI and Machine Cognition around a focal problem
- Should lead to major advancement in Presence Theory, Experiment and Technology

Science requirements

- Should lead to major advancement in the neuro-biological foundations of Presence
- Should deliver globally accepted standards for benchmarking of Presence
- Should provide clear guidelines for technology development
- Should have the potential to lead to a scientific paradigm for research in this area (we mean "paradigm" in the technical sense of Thomas Kuhn).

Technology requirements

- Should deliver unobtrusive technologies for researchers everywhere
- Should deliver tangible technologies and applications

Impact requirements

- Should deliver at least one immediate powerful, important application

2. The Panel Topics

The panel will cover the following topics. The first will overview the rationale for a Grand Challenge. There exist today several working definitions of presence, including these and other variants:

Qualia view: targets the subjective experience of being there and how to achieve and modify that experience in virtual or augmented environments.

Cognitive view: studies how the human brain constructs the model of reality and self through replacement/augmentation of sensorial data and interaction (VR, AR and beyond). Belongs to a wider class studying how cognitive systems build models of their environment and interact with it.

Technology driven view: addresses the cognitive experience of being somewhere and developing technologies to generate and augment it (being someone or something, somewhere, sometime, without physically being there).

Measurable view: Presence studies the successful replacement/augmentation of sensory data with virtual generated data, with success defined by analyzing the response of the subject in physiological, behavioral, emotional, cognitive and subjective terms in relation to a potentially real situation.

Despite the different views on the definition of the field, it appears to be easier to reach a consensus in terms of the fundamental goal of the field: **Goal:** to develop science and technology to achieve successful replacement/interaction (i.e., Presence, being there) and open up a wide range of powerful applications.

Designing and carrying out a visionary project with this goal in some concrete form would have the benefit of concentrating the efforts and building a strong community, while opening up a large set of powerful applications.

The other topics will be:

2.2. Challenges in Human Computer Interaction for Presence (Martin Buss)

2.4. Challenges in Human Cognition and Behavior for Presence (Mel Slater and Mavi Sanchez Vives)

2.5 Challenges in Machine Cognition for Presence (Paul Vershure)

3. Panel Structure

It is envisaged that the panel would be for 1 hour and 30 minutes, divided between the 4 talks with time for questions and discussion both within each talk and at the end.

00-15 min A Grand Challenge for Presence(G Ruffini)

15-30 min Grand Challenges in HMI (M Buss)

30-45 min Grand Challenges in HC (M Slater and M Sanchez)

45-60 min Grand Challenges in MC (P Vershure)

60-90 min Discussion

References

[1] Ruffini, G., Ed., et al., PEACH: Presence Visions, Roadmaps and the ERA, <http://peachbit.org> .