



**H.F.R.I.**  
Hellenic Foundation for  
Research & Innovation

**Description of the funded research project**  
**1st Call for H.F.R.I. Research Projects to Support Faculty**  
**Members & Researchers and Procure High-Value**  
**Research Equipment**



**Title of the research project:** metaVR: Nonverbal Communication in Immersive Virtual Reality

**Principal Investigator:** Spyros Vosinakis

**Reader-friendly title:** metaVR

**Scientific Area:** Social Sciences

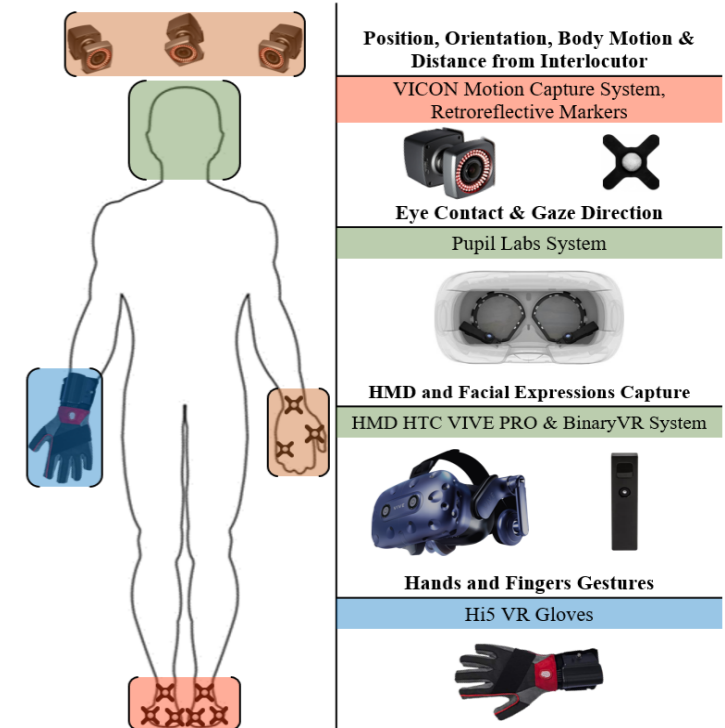
**Institution and Country:** University of the Aegean, Greece

**Host Institution:** Department of Product and Systems Design Engineering

**Collaborating Institution(s):**

- Interactive Systems Design Laboratory
- Image, Sound and Cultural Representation Laboratory

**Project webpage:** <https://metavr.aegean.gr/>



**Budget:** 168.399,00€

**Duration:** 36 months

## Research Project Synopsis

The metaVR research project comprises an in-depth and cross-disciplinary analysis of Virtual Reality as a communication medium. The main research objective is to thoroughly investigate the potential impact of nonverbal cues during synchronous, interpersonal interaction among physically remote individuals, immersed in a shared Virtual Environment. The research project initiates pertinent questions for understanding emerging technologies and their societal impact and proposes a roadmap as to how VR may serve as a methodological tool for the socio-psychological analysis of human communication, by documenting cost-effective solutions for complex experimental setups and realistic simulation of Face-to-Face communication. Performance and functionality tests upon such systems, even more so, the investigation of the social and affective impacts of nonverbal cues in the context of immersive experiences, represent uncharted areas of research.

## Project originality

The metaVR research project suggests an interdisciplinary and multi-faceted approach, balancing among conceptual and technical aspects. The project advances VR's state of the art and makes a broad range of innovative contributions. Specifically:

- facial tracking technologies have not been academically evaluated in regards of functionality and there are no studies examining the socio-psychological impacts of real-time facial expressions as part of VR-mediated interpersonal communication,
- no other experimental setup exists wherein remote communicators engage in synchronous interaction, while maintaining full motor and expressive control of their avatars. Subsequently, this is the first immersive-VR study, combining multiple tracking systems and addressing issues of simultaneous data-flow,
- focal social and psycho-emotional components of nonverbal communication, as addressed by Social Psychology, have not been investigated within and under the influence of the multiple simulating features of immersive interpersonal VR-mediated interaction, although extensive research already exists related to non-immersive VR and intelligent agents,
- design-related components of the VEs and the avatars define context and parts of nonverbal communication (e.g., communicator appearance) by using *signifiers*, thus affecting the interaction and making the designer a key actor in the communicative process. These implications have not been addressed in regards of synchronous VR-mediated interaction.

The above listed innovative aspects underline the research ambition, contributions and long-term scientific perspective of metaVR, since the proposed methodology promises to (a) initiate an in-depth understanding of emerging technologies and their societal impact, and (b) propose a roadmap as to how VR may serve as a methodological tool for the socio-psychological analysis of human communication, by documenting cost-effective solutions for complex experimental setups and realistic simulation of FtF communication.

## Expected results & Research Project Impact

The interdisciplinary approach of metaVR responds to the imperative need of investigating the impact of the usage of VR systems as a communication medium, since current developments suggest that VR technologies are only at the starting point of a rapid technological and commercial growth. In addition, the interdisciplinary character of the metaVR research project initiates productive discourse among scientific fields and showcases the plausibility of variant cross-disciplinary collaborations. The methodological implementation will provide the necessary set of guidelines for the proper design of VR applications (emphasizing on design principles and ethics), as well as similar experimental setups. Conclusions of this study are expected to have a broad scientific impact, since relating issues and research objectives, in reference to different technologies, are being addressed for decades, providing us with solid applied and theoretical background.

## The importance of this funding

The metaVR project is comprised by a team of seasoned academics, but more importantly young researchers, each bringing their expertise to ensure interdisciplinarity along with variance in point of views regarding the novel technology's overall impact and potential for pragmatic mergence with existing infrastructures of day-to-day communication. Notwithstanding, access to state-of-the-art technology and laboratory equipment is crucial, since progression of individual expertise is based on experimental research that provides, not simply hands-on experience, but also an opportunity to challenge technological feasibility and perform in vitro testing for up-close examination that, in turn, challenges the existing knowledgebase. These, as the pillars of epistemological diligence, are what forward science, trigger innovation and, ultimately, lead toward societal improvement.

For such reasons, the H.F.R.I aegis and support is a direct contribution toward the growth and empowerment of starting academics, who are encouraged to progress their respective fields of research and provide informed, scientific conclusions and solutions, the benefits of which far exceed the confines of a laboratory.



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