

Designing and Developing Air-based Interactions

Project Leader

REN Xiangshi, Dr. Eng.

Professor, Information Systems Engineering

Director and Professor, Center for Human-Engaged Computing

Faculty Members Involved in this Project

HOSHINO Yukinobu, Dr. Eng.

Assoc. Professor, Electronic and Photonic Systems Engineering

PARK Kaechang, D.M.

Visiting Professor, Research Organization for Regional Alliances

1. Objective

This project is aimed at:

Investigating human interactions using air-based interfaces and studying the efficiency of air-based interfaces for various applications and environments. Furthermore, the project aims to develop air-based interface prototypes, e.g., air-haptic interfaces, air-input interfaces, air-based bi-lateral communications etc., Our research emphasizes the understanding of human interaction capabilities and the modeling of human performance when interacting using air-based interfaces in both common interaction situations and also in specialized situations where electromagnetic interference must be minimized e.g., fMRI scanning environments and the like. Research outcomes will not only support the design of air-based systems suitable for various interaction conditions but also contribute to our understanding of human behavior and interaction guidelines in general.

2. Project Outline

To that end, the project will consist of the following phases:

- (a) Undertake systematic literature reviews and appraise human-computer interactions that report air-based interface research
- (b) Designing and developing various air-based interfaces, for both general and special purposes.
- (c) Conducting experiments to evaluate the efficiency of air-based interfaces by understanding human capabilities in interacting with the devices in various situations, e.g., fMRI experiments, user experiments.
- (d) Developing design guidelines for the design of optimal air-based interfaces for various applications and environments, e.g., fMRI and similar sensitive environments, navigation, simulations, communications.

3. Expected Performance

In this project, the successful candidate would be expected to:

- (a) Publish at least 2 excellent research papers in top-tier international conferences (ACM CHI, ACM UIST) and international journals or transactions in the field of Human-Computer Interaction (HCI)
- (b) Assist in the supervision of Masters and Bachelor students for their theses.
- (c) Report project progress in meetings and update progress to the laboratory's website.

4. Required Skills and Knowledge

The successful candidate for this project will have the following knowledge and skills:

- (a) Work independently as well as in an international team

- (b) Strong knowledge of mathematics and statistics.
- (c) Strong software development skills.
- (d) Strong communication ability and interpersonal skills.
- (e) Strong ability in English Language (spoken and written).
- (f) Experience with prototyping technologies such as Arduino, 3D printer, basic electronic circuit.

See our lab website:

<http://xrenlab.com/>

<http://xiangshiren.com/>

See our admission guidelines:

https://www.kochi-tech.ac.jp/english/admission/ssp_aft19oct/ssp_application_guideline.html

Contact

E-mail: ren.xiangshi@kochi-tech.ac.jp