

Design of Smart Objects for the Digital Transition: User-Centered Design, Digital Technologies, Additive Manufacturing

DEVELOPMENT OF INNOVATIVE PRODUCTS TO ENHANCE WELL-BEING AND SOCIAL INCLUSION

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Related research groups: Applied Math (UNICAM), Computer Science

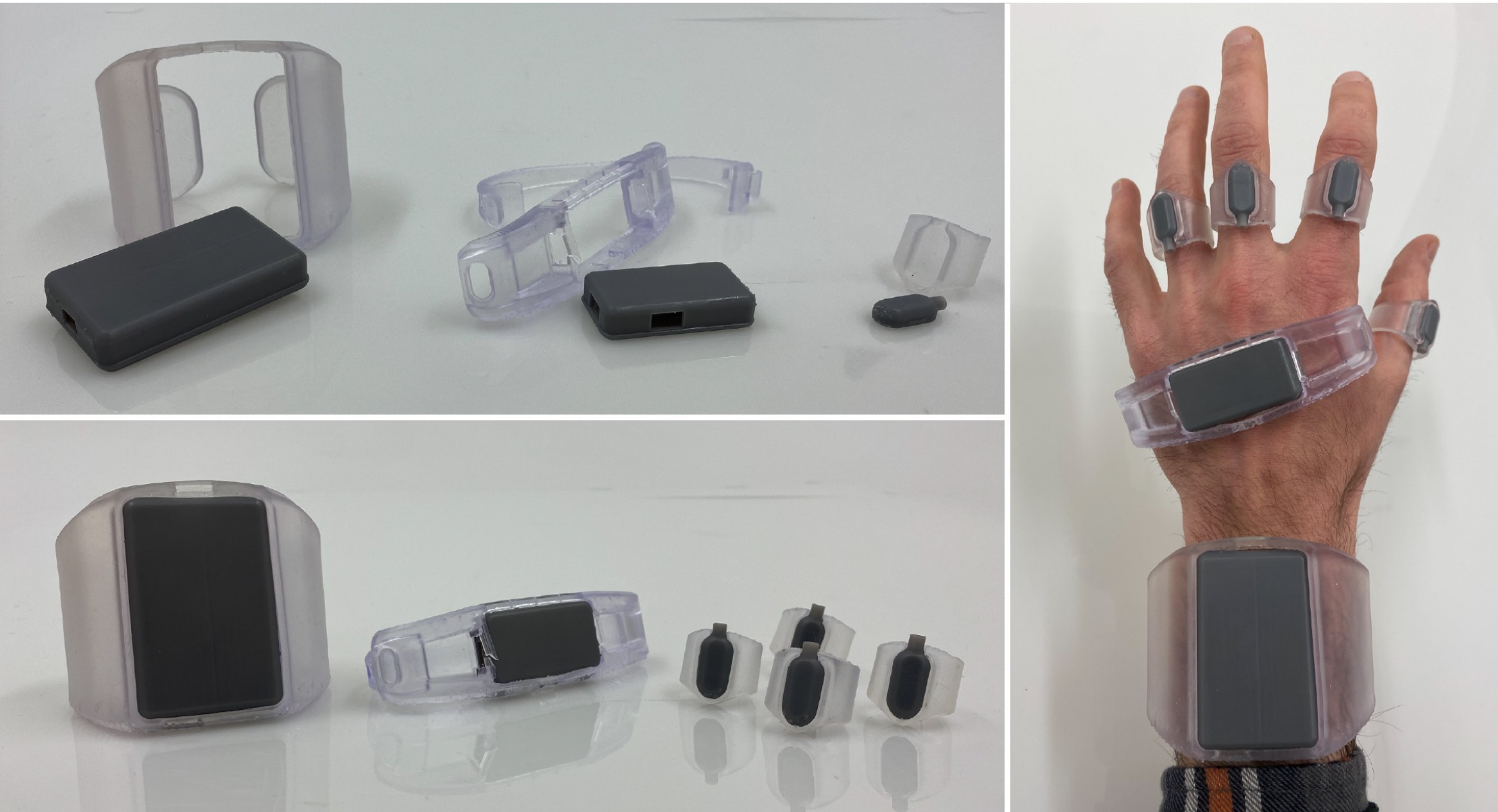
Partner: LiMiX

Permanent/temporary staff: 20% permanent staff / 80% temporary staff

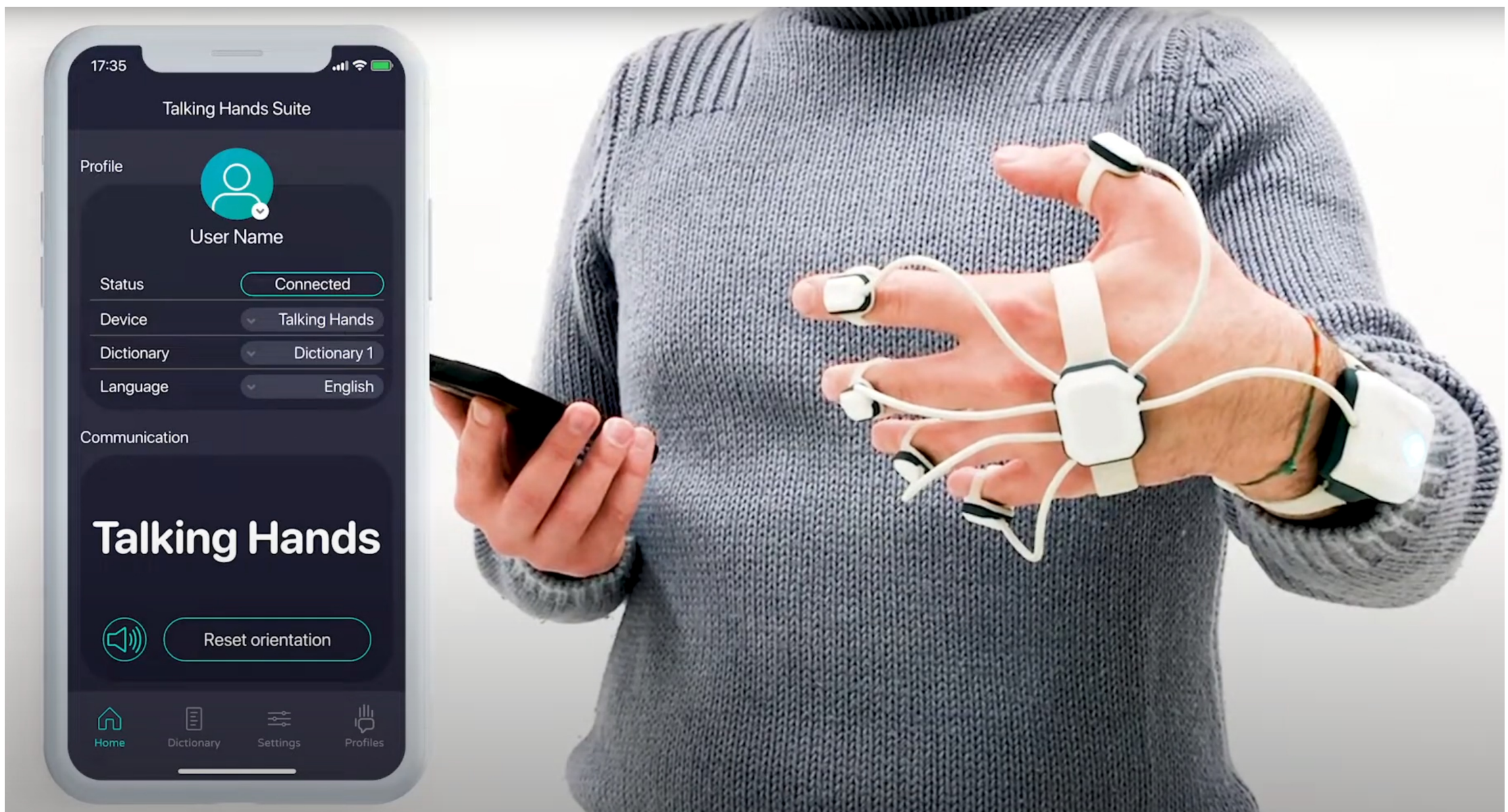
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Characterising studies

Talking Hands, developed in recent years by LiMiX Srl, a Unicam spin-off, Talking Hands is a data-glove system for augmentative and alternative Communication, designed to assist individuals with temporary or permanent language impairments, enhancing their ability to engage in social interactions and, consequently, improving their quality of life. Usable both as a rehabilitative tool and as a communication aid, the device can detect hand movements, apply a recognition algorithm, and translate these movements into verbal language in real time through a dedicated application. The aesthetics and user experience were developed following a user-centered design methodology. This involved identifying three different target user profiles and defining specific routines associated with five key contexts of their daily lives. For each user, a personalized design of the device was developed to address their identity, expectations, and social background. The final product design was prototyped using additive manufacturing processes and tested in a real operational context to verify the alignment between initial expectations and the satisfaction of actual needs.



Final aesthetic prototype of the device – Far 2019 WP2

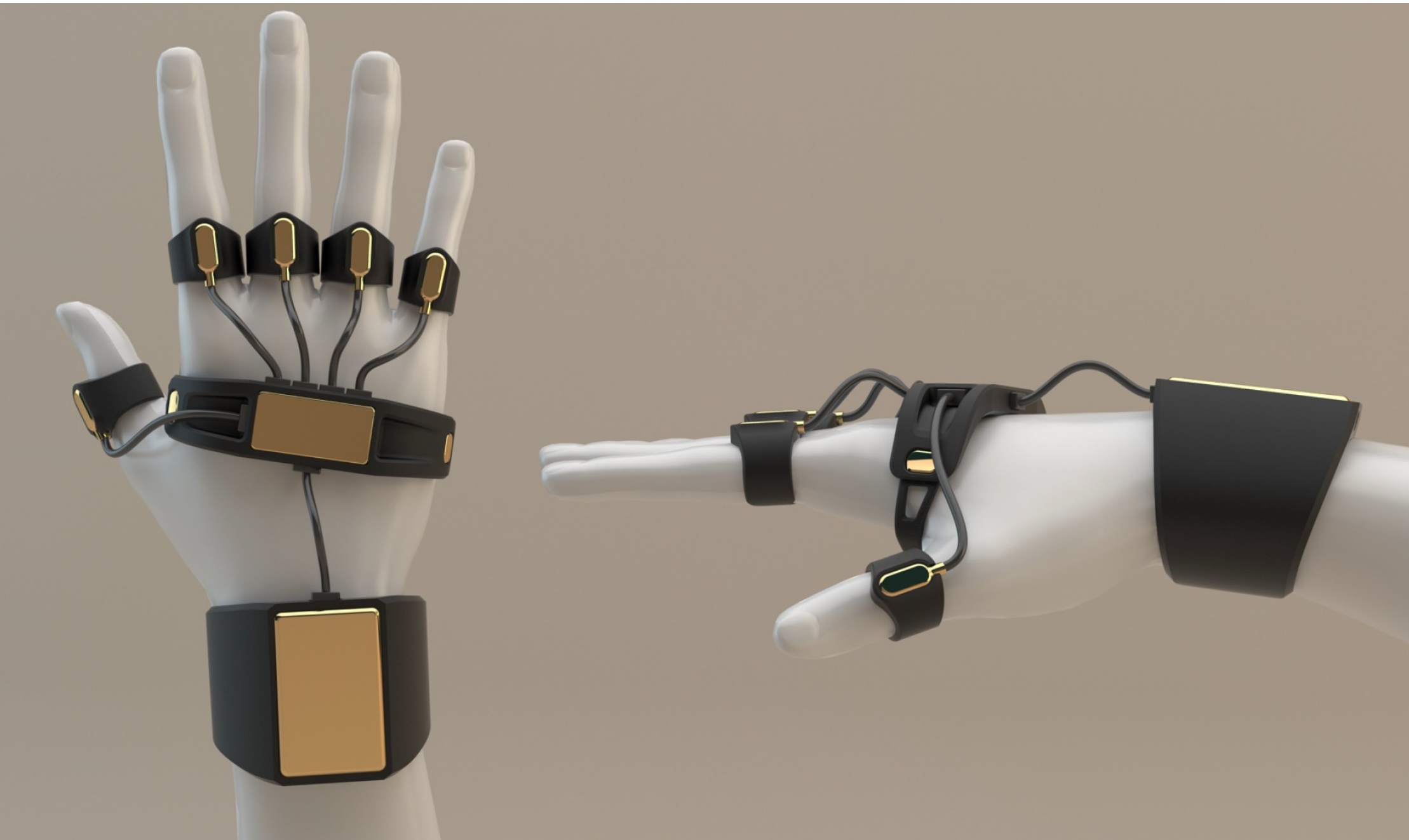


Talking Hands Plus: Enhancing Communication and Brain Activation – LIMIX

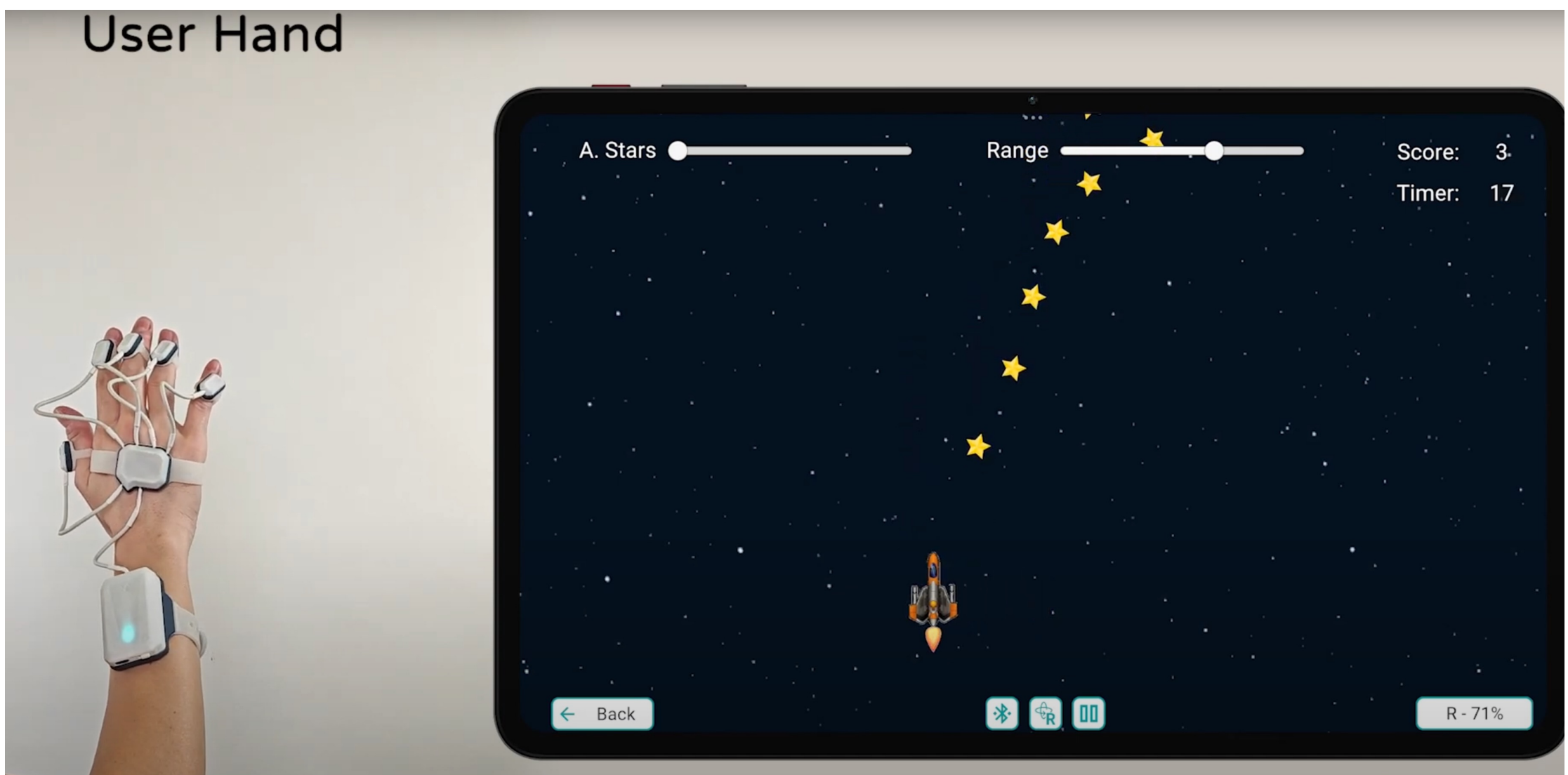
Financing and business relationships

Talking Hands has been launched in 2015 with the establishment of UNICAM's spin-off LiMiX Srl. The project was later co-funded in 2020 through the Call for Funding of University Research Projects (FAR 2019) with the title «Talking Hands: from a prototype to an effective device» (PI: Prof. Maria Letizia Corradini). Within this framework, the design unit contributed to WP2, «Study and realisation of a new design to ensure the usability of the product by the target users» (WP2 leader: Prof. Lucia Pietroni). The results has been further developed within the agreement led by LiMiX Srl on the «Fondo Complementare PNRR Area Sisma, Bando B1.3.B INNOVAZIONE PMI» (Talking Hands 360, PI: Prof. Daniele Rossi).

During years, from idea to effective product the project has involved public and private entities, including associations and rehabilitation centers such as Santo Stefano Riabilitazione, Lega del Filo d'Oro (Italian foundation for the deafblind), and Policlinico Universitario Fondazione Agostino Gemelli. At the international level, the partnership includes Centrum Neuroterapii Rutkowski (Poland), Nirbhay Singh (Augusta University, Augusta, Georgia, USA), Mark O'Reilly (University of Texas at Austin, Austin, Texas, USA), and Jeff Sigafos (Victoria University of Wellington, Wellington, New Zealand).



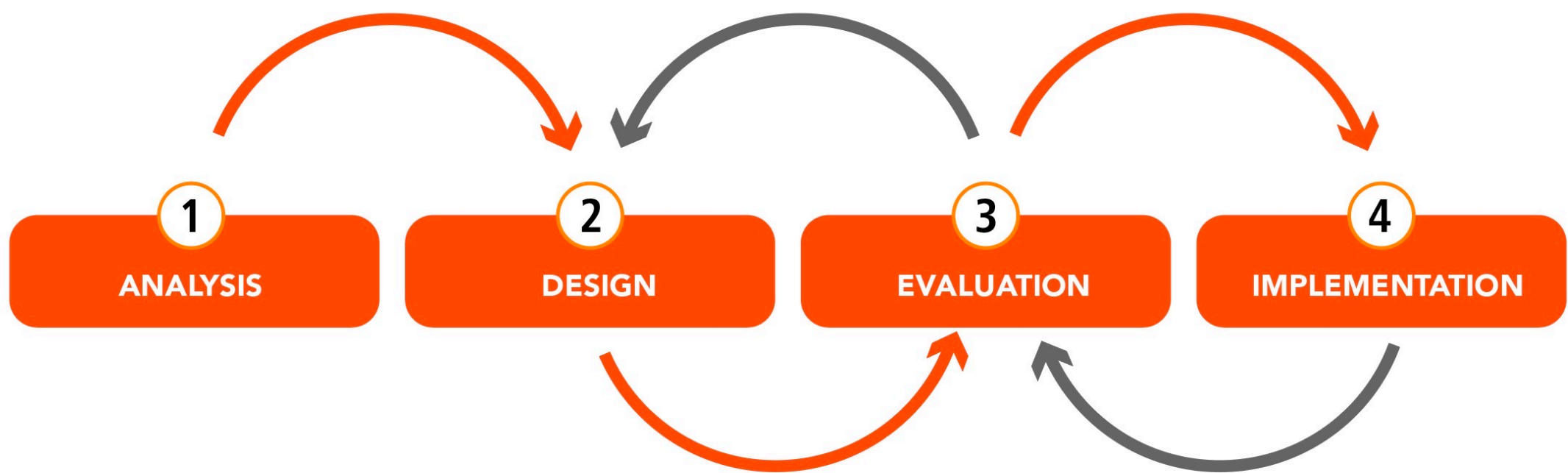
Rendering of the developed device – Far 2019 WP2



Talking Hands 360: Enhancing Communication and Brain Activation – LIMIX, Bando B1.2.B Innovazione PMI

National and international results and impacts

Talking Hands 360, the final evolution of the product, represents a significant advancement in neuro-motor rehabilitation technology (currently under testing), offering a comprehensive solution for individuals seeking to regain hand function and improve motor skills. By leveraging the powerful platform of Talking Hands Plus, this rehabilitation glove not only facilitates physical recovery but also enhances cognitive function and overall well-being. As an innovative therapeutic tool, Talking Hands 360 is poised to transform the landscape of neuro-motor rehabilitation, delivering profound benefits to those on their path to recovery.



Macro activities for a User-Centred Design methodological approach (UCD) – Far 2019 WP2