Ref. MovIntPlayLab+BODYinTRANSIT-PhD:
Pre-doctoral Position in Playful Wearables and Augmented Technology for Body Experiences, Rehabilitation, and Physical Training.

The Universidad Carlos III de Madrid (UC3M) offers a full-time pre-doctoral position as part of the projects: **MovIntPlayLab - Embodied Interaction & Play Design Lab: A design program for technology-supported movement-based experiences for play, physical activity, and training**; and **BODYinTRANSIT: Sensory-driven body transformation experiences on-the-move**.

The PhD project will center on designing and studying wearables and other body-based multisensory technology to augment and enrich rehabilitation and physical training practices, and to impact people's body perception, emotions and behaviour. While physical training has plenty of shown benefits both for specific populations (e.g. people in need of rehabilitation), as well as for the public at large, it can be especially challenging when there are no intrinsic motivators such as when training is externally prescribed (e.g. rehabilitation), and/or for target groups who do not enjoy training or experience other sort of psychological or physical barriers to physical activity. Both technology and play can be assets in this regard, which explains the general enthusiasm with technology-supported training and with playful forms of training (exertion games; playification, gamification, and serious games for training). They can support immersion, enjoyment, and positively affect training. However, designing interactive training experiences that are both enjoyable and effective is not straightforward. This PhD will address this challenge focusing on wearables and augmented training equipment.

The position is fully funded by the Madrid Government (Comunidad de Madrid) under the Multiannual Agreement with UC3M in the line of "Research Funds for Beatriz Galindo Fellowships" (MovIntPlayLab-CM-UC3M), and in the context of the V PRICIT (Regional Programme of Research and Technological Innovation);" and by the European Research Council (ERC) Consolidator Grant Horizon 2020 BODYinTRANSIT (https://bodyintransit.eu/).

Overall description of the research group and project: The successful candidate will join a new, diverse, multi-disciplinary and international research group led by Prof. Elena Márquez Segura and Prof. Ana Tajadura-Jiménez working at the intersection of Human-Computer Interaction (HCI), Interaction Design (IxD), Games and Play, and Cognitive Neuroscience. The research group is part of the DEI Interactive Systems group at the UC3M Department of Informatics.

The PhD candidate will work with designers, HCI researchers, computer scientists and engineers, psychologists and cognitive neuroscientists, healthcare professionals (surgeons, rehabilitators, physiotherapists), acousticians, philosophers, and ethics experts. Their PhD project will develop in close contact with an international network including, among others collaborators within University of Southern Denmark, Uppsala University and Malmö University (Sweden), Aalto University (Finland), University of Twente (The Netherlands), University College London, Birkbeck - University of London, IRCAM - Paris, LMU - Munich, Tilburg University, Ritsumeikan University - Japan, and the Estonian Academy of Arts.

Job Description:
The PhD project will follow a Research through Design (RtD) approach, wherein the ultimate particulars (i.e. designs) and designing (the actual design process) result in valuable design research knowledge and will entail:

- Designing, implementing, and studying interactive physical training experiences supported by wearables and other body-based technologies.
- Using– and extending–innovative participatory embodied design methods involving end users (practitioners, patients) and other stakeholders (including designers, researchers, instructors, therapists, healthcare providers, etc.).
- Conducting field studies in real-life contexts (e.g. rehabilitation, physical training).
- Investigating the transformative power of designs through quantitative and qualitative research methods.
- Engaging in communication, dissemination and exploitation of results to ensure impact and transference of knowledge.

Other specific responsibilities that this position involves include:

- Conducting literature reviews of the state-of-the art of the project research area.
- Designing, conducting and analyzing data from exploratory studies, experimental studies, and design sessions.
- Working directly with multiple stakeholders, including end users (practitioners, patients) and other stakeholders (including designers, researchers, instructors, therapists, healthcare providers, etc.)
- Recruiting participants for design research activities.
- Communicating with user centers, clinics/ therapists, potential patient recruitment.
- Disseminating results in multiple forms to design and scientific peers including publishing papers at conferences and international peer-reviewed journals, and conducting demonstrations, workshops, etc.
- Participating in the organization of different outreach activities, such as school science exhibitions, public exhibitions, seminars and workshops.
- Archiving research data and publications.
- Participating in group meetings.

Qualifications:

To apply to this pre-doctoral position, a degree in the area of Computer Engineering or related areas (e.g. Human-Computer Interaction, Software Engineering, Computer Science, Telecommunication Engineering) is needed. The PhD candidate also needs to fulfil the general eligibility criteria of the UC3M Computer Science and Technology PhD program: https://www.uc3m.es/phdprogram/computer-science-technology#access.

The following specific qualifications are also required:

- Proven experience working with ubiquitous and embedded systems, like wearables;
- Programming experience relevant to the development of embedded systems (e.g. C, C++, Python; Arduino, etc.);
- Experience with research methods (quantitative and/or qualitative);
- Excellent verbal and written communication skills in English;
- Excellent organization skills;
- Proven ability to effectively work independently and as part of a collaborative research team;
- High empathy and excellent capacity to decode and understand movement, and physical engagement;
- Creativity, ability to engage in critical thinking, design, and research.

Plus:

- Experience designing and implementing immersive technology, and/or games;
- Experience with other relevant programming languages (e.g. C#, Java, JavaScript);
- Experience with 3D game development engines (e.g. Unity, Unreal);
- Experience with graphic design;
- Demonstrated interest and personal experience with multiple physical practices, e.g. sports, rehabilitation, etc.
- Proven design and/or research experience, especially in areas relevant to the research project;
- Proven research experience with human users and participants;
- Proven experience with design methods;
- Proven experience with multiple research methods (quantitative, qualitative, mixed);
- Strong interpersonal skills, important to work effectively as part of a highly collaborative research team, to perform studies with participants, and to build and maintain a network of peer researchers/designers/engineers, students, end users, as well as partners in industry and relevant application domains.
- Excellent verbal and written communication skills in Spanish.

What we offer:

- Total duration of the contract: 3 years (+fourth year if needed), through renewable 1-year contracts.
- Annual gross salary of 21600 €.
- Start date: Spring 2022.
- Possibility to obtain an international PhD degree, with research stay(s) at collaborating international labs.
- The position includes ad hoc training in specific research skills and career development initiatives.
- Become part of a young, dynamic, highly qualified, collaborative team.
- Opportunity to travel to international venues to present research activities.
- Health coverage under the National Health System.

How to apply:
The application involves a two-step process: Interested students need to:

1 – Send the following **application package** in English in a single PDF file to elena.marquez@uc3m.es with the following subject: "PhD_MovIntPlayLab-family_name_of_applicant". The deadline is **November the 30th 2021**:

- A motivation letter (max. 2 pages) explaining why the PhD candidate wants to pursue this PhD, highlighting the candidate's strengths and assets useful for the completion of their PhD studies.
- A full CV (up to 3 pages) reflecting experience in research, design, industry, as well as research publications.
- A copy of your university degree certificates/diplomas (Bachelor's and Master's degrees or equivalent)
- A copy of your academic transcript of records of undergraduate studies (Bachelor's degree) and graduate studies (Master's degree), including grades.
- Full contact details of 2-3 references who can provide us with a recommendation letter. Optionally, you can include these recommendation letters in your application package.

2 – Apply for admission at UC3M (https://www.uc3m.es/phdprogram/admission/application) before December the 7th 2021. You can find more information about how to apply here: https://www.uc3m.es/phdprogram/admission/admission-phd-programs.

Top candidates will be invited to an individual **online interview** organized by UC3M.

More Information, and Help:
Enquiries can be made to Dr. Elena Márquez Segura, email: elena.marquez@uc3m.es. Please use the following subject in your email: "PhD_MovIntPlayLab-family_name_of_applicant". Candidates also are encouraged to contact Dr. Márquez Segura for help to apply for admission as well as to discuss and ask any question they may have about this PhD position.

Brief description of the institution:
Universidad Carlos III de Madrid (UC3M) is a state public university established in 1989. Its main goal is providing specialized training in Engineering, Law and Social Sciences, Humanities, Communication and Library Science; and becoming a leading European research center. Research is a fundamental pillar of UC3M, which strives to attract talent and create new research areas. The UC3M is among the top Spanish universities for their participation in European level R&D&I programmes. The University has five centers: 2 Faculties, 1 Technical School, 1 School of Graduate Studies and 1 Doctoral School within 4 Campuses. UC3M is divided in 28 Academic Departments, 28 University Research Institutes and 133 Research Groups. UC3M has 22.600 students, over 1200 doctoral students and near 2000 Faculty.

The Universidad Carlos III de Madrid hires on the basis of merit and is strongly committed to equity and diversity within its community. All qualified applicants are encouraged to apply, they will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law. Note that if the successful applicant is neither a European citizen nor a permanent resident of Europe, he or she must be issued a work permit prior to commencing the position.