

Division of Frontier Engineering	Research field	Co-creation system	Lab. ID FE20
Laboratory web site			
Research subjects			
People coordinate their actions with others by synchronizing their timing, as seen in music and sports. However, people perceive time subjectively, which does not necessarily align with physical time. Moreover, subjective time varies from individual to individual, meaning that one's own perception of time does not always match that of others. This makes it remarkable that people can synchronize their actions with one another. In our laboratory, we refer to this extraordinary coordination as "co-creation" investigate its characteristics through behavioral experiments and mathematical modeling. Furthermore, we conduct research and development on "co-creation systems" to establish such synchronization between people and artificacts. For example, we use psychological experiments to investigate the characteristics of coordinated rhythmic movements, such as those observed in musical ensembles, and develop mathematical models to describe their underlying mechanisms. As an application, we are working in the field of medical-engineering collaboration to develop novel rehabilitation robots and VR systems based on rhythm synchronization models. Additionally, we are developing a wearable system for simple motion measurement in rehabilitation settings and applying machine learning techniques to analyze the collected data.			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
Students will have regular research meetings with faculty members to discuss the direction and progress of their research. In addition, students will present the progress of their research in seminars. In addition, each student is required to give a presentation of a research paper in English closely related to their research. In the seminar, students are strongly encouraged to actively ask questions to other students' presentations. Through these discussions, lab members together develop logical thinking skills. In addition, students are required to present their research at domestic and international conferences and to submit papers to international journals. Since these require considerable preparation, careful research planning and scheduling are essential. Through conference presentations and academic writing, students aim to develop the ability to effectively communicate their research and ideas.			
Daily life in the laboratory, etc.			
There are no set core lab hours. You are free to come to the lab, but we encourage you to come during the times when faculty and other students are present. Research is not something to be pursued alone; it progresses more effectively through collaboration with faculty staff and other students. Casual conversations with other students can often spark new ideas, so let's conduct our research together in the lab. We also hold regular get-togethers to deepen the connections within the laboratory.			
Message or comments by the laboratory faculty staffs			
Our laboratory is well-suited for those interested in understanding human interactions and exploring their applications. It is also a great fit for those fascinated by behavioral experiments, mathematical modeling, and human interfaces. We also welcome individuals interested in medical-engineering collaboration in the field of rehabilitation. You can even have the opportunity to test the systems you develop at partner hospitals. Additionally, our research includes behavior measurement systems and data analysis using machine learning. Research is about tackling unknown and unexplored challenges, which can sometimes be difficult and demanding. But that is why it is important to enjoy the process. I hope that all of you will take ownership of your research and find joy in it.			
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