

## Division of Environmental Studies

### Department of Human and Engineered Environmental Studies

Laboratory	Faculty	Introduction of research activities and laboratory	Key words	Projects or activities summer program students can participate
<a href="#">Simulation of Complex Systems Laboratory</a>	<a href="#">Assoc. Prof. Yu CHEN</a>	In our lab, fields of research range from social-economic, complex fluid, to biological systems. There are three research directions: (1) Multi-agent cooperative evolutionary games for modeling and simulations of financial markets; (2) Discrete kinetic models for the simulation of complex fluids; (3) Cellular automata and heterogeneous stochastic agent models for the simulation of aging and cancers.	1) Complex systems 2) Agent-based modeling 3) Financial markets	In the program, a small project will be assigned to the visiting student, basically relating to model construction and computer simulations. The specific complex system for study depends on student's interest. It could be a financial market, a solution including colloid, or a growing tumorous tissue. Apart from the research activity, visits of related labs in other university, and/or scenic sites surrounding Tokyo, etc. are also being scheduled.
<a href="#">Human and Environment Informatics Laboratory</a>	<a href="#">Prof. Shin'ichi WARISAWA</a>	At Human and Environment Informatics Laboratory, we are doing research about both sensor devices based on new detection principals, and daily life habit and environment monitoring system, aiming at contributing to the realization of a safe, secure, and comfortable society. Sensor device development researches are currently conducting respiratory gas sensing devices which are realized by nano/micro mechanical resonator, graphene, and plasmonic devices based on nano/micro fabrication technologies. Daily life habit and environment monitoring systems are researched for wearable blood pressure monitoring, human behavior recognition, stress monitoring, and emotion recognition.	1) Wearable sensor 2) Human physical/ mental state recognition 3) Machine learning 4) Deep learning 5) Python	The project that our laboratory provides is to recognize human behaviors, stress/relax conditions and emotions by means of wearable and non-wearable sensor information. The necessary information can be collected by small units of wearable motion sensors, physiological sensors, or non-wearable cameras and microphones in our sensing room we have developed. To a student who wants to join our group, machine learning or deep learning techniques are strongly required, and thus such knowledge and programing skills are very important to achieve the project mentioned above.