

Seminar

バイオミメティクス： 異分野を繋ぐ多次元生命情報研究

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June 17th, 15:00 ~ 16:00

Building E (E131)



Living organisms have evolved over millions of years to acquire functional structures that are perfectly adapted to their environment. Therefore, a deep understanding of the mechanisms underlying these functions and the ability to (1) analyze, (2) reverse-engineer, and (3) reproduce these processes is at the core of both fundamental and applied science. Traditionally, these problems are tackled with independently from the perspective of a particular scientific discipline. Biomimetics is a multi-disciplinary field that brings together researchers from all frontiers of science to achieve the above, with information science as a common core discipline.

During this seminar, we will introduce ongoing projects that illustrate the potential of biomimetics and information science to contribute to extremely diverse scientific problems, and illustrate the necessity to develop further computational techniques to generate, handle, interpret, and physically make use of multi-dimensional biological and structural data more than three dimensions. The projects presented here have in common the data acquisition and physical replication of microscopic structures. The first example is biomimetic shark skin, for which we developed an efficient infrastructure for generating and experimentally testing biological-like surface microstructures with applications in fluid dynamics. The second example is the development of nucleic acid hydrogels with tunable properties, which, among other applications, have the potential to mimic certain biological functions of the cytosol. The long-term goal is to develop a framework for integrating computational and experimental methods across various fields to generate novel biologically useful models for experimental research.

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