



UP Manila Theater, Rizal Hall Room  
University of the Philippines, Manila

21 November, 2018

# International Lectures from Japan

## Perceptual Psychology and Applied Mathematics and Computer Science

### Lecture 1: **Computational Intelligence**

Following basic introduction of fuzzy systems, neural networks, and evolutionary computation (EC), we learn one of EC applications, interactive EC (IEC) which optimizes a target system based on human subjective evaluations. Through many IEC applications in wide variety of application areas, we learn its wide applicability and consider how to apply IEC to our research. Related slides and a tutorial paper are downloadable from the "downloadable files" menu at <http://www.design.kyushu-u.ac.jp/~takagi/>

### Lecture 2: **Computational Biology**

Following basic introduction of computational biology and bioinformatics, we will learn how Bayesian inference and machine learning approaches are applied to biological data through examples.

### Lecture 3: **Human Perception and Brain Research**

In this lecture we will look at the structural and functional organization of the human brain, and discuss the workings of the brain in relation to human perception. The examples of neuroscientific research will mostly relate to human hearing and vision.

- 09:30 - 09:45 Opening:  
**Introduction of the Human Science International course**  
(Hideyuki Takagi)
- 09:45 - 10:45 **Computational Intelligence**  
(Hideyuki Takagi)
- 10:45 - 10:55 (break)
- 10:55 - 11:55 **Computational Biology**  
(Osamu Maruyama)
- 11:55 - 13:00 (lunch)
- 13:00 - 14:00 **Human Perception and Brain Research**  
(Gerard B. Remijn)
- 14:00 - 15:00 **Chronobiology**  
(Hiroshi Ito)
- 15:00 - 15:20 Q&A for whole lectures and studying in Japan for those who have questions and

### Lecture 4: **Chronobiology**

Chronobiology is a part of biology, which deals with repetitive life phenomena. We shall look at many fascinating examples of biological rhythms. The mechanism of the phenomena will be presented through mathematical modeling.



**Hideyuki Takagi** is a Professor of Faculty of Design, Kyushu University and has worked on computational intelligence. He is especially interested in combining human factors and computational intelligence. His lab is the center of interactive evolutionary computation



**Osamu Maruyama** is an Associate Professor of Faculty of Design, Kyushu University. He is mainly interested in computational biology and bioinformatics. Research in his laboratory focuses on devising methods based on statistical modeling and machine learning.



**Gerard B. Remijn** (the Netherlands) is an Associate Professor of the Faculty of Design, Kyushu University. He is mainly interested in perceptual processes in the human brain, with research on a wide variety of topics related to auditory perception, visual perception, and time perception. Research in his laboratory focuses on psychophysics and brain research.



**Hiroshi Ito** is an Associate Professor of the Faculty of Design, Kyushu University. He is interested in biological rhythms such as sleep-wake cycle from the point of physiology as well as non-linear physics. His research group focus on detecting molecular mechanisms of circadian rhythm of micro-organisms and elucidating its mathematical structure through modeling.