24 November 2016

Departemen Teknik Elektro dan Teknologi Informasi dan

Departemen Teknik Mesin dan Industri, Universitas Gadjah Mada

International Lectures from Japan

Sponsored by: Human Science International Course, Graduate School of Design, Kyushu University, Japan

Antro-Fisiologi, Psikologi Perseptual, dan Matematika Terapan dan Ilmu Komputer

Physiological Anthropology, Perceptual Psychology, and Applied Mathematics and Computer Science

E6, Third Floor, Dep. Teknik Elektro dan Teknologi Informasi

08:50 - 09:00 Opening,
09:00 - 09:15 Seminar objectives and introductions
(Prof. Hideyuki Takagi)
9:15 - 10:15 **Neuro-Fuzzy-EC Systems: from laboratory models to real-world applications**
(Neuro-Fuzzy-EC Systems: dari model laboratorium ke aplikasi dunia nyata)
(Prof. Hideyuki Takagi)
10:15 - 10:30 Q&A
10:30 - 10:45 (break)
10:45 - 11:45 **An Introduction to Brain Research and Human Perception**
(Pengantar Riset Otak dan Persepsi Manusia)
(Prof. Gerard B. Remijn)
11:45 - 12:00 Q&A

R Sidang 1, 2nd Floor, Dept. Teknik Mesin dan Industri

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10:45 - 11:45 **Interactive Evolutionary Computation**
(Intraktif Komputasi Evolusioner)
(Prof. Hideyuki Takagi)
11:45 - 12:00 Q&A

Lecture 1: **Neuro-Fuzzy-EC Systems: from laboratory models to real-world applications**

We explain how Soft Computing techniques were combined and how these models created in laboratories were applied for consumer products and industrial systems. Recommended reference is:

H. Takagi, "Fusion Technology of Neural Networks and Fuzzy Systems: A Chronicled Progression from the Laboratory to Our Daily Lives," Int. J. of Applied Mathematics and Computer Science, 10(4), 647-673 (2000).

http://www.design.kyushu-u.ac.jp/~takagi/TAKAGI/otherPapers/MathCS1.pdf

Lecture 2: **An Introduction to Brain Research and Human Perception**

We will look at some research examples that show the workings of the brain in relation to human perception. We perceive the world around us through our sensory systems. Information that enters our eyes and ears, or other sense organs, needs to be interpreted by our brain. We will discuss some research techniques that give us insight into the workings of our brain and our behavioral responses to sensory information.

Lecture 3: **Interactive Evolutionary Computation**

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/

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.

Hideyuki Takagi is a professor of Faculty of Design, Kyushu University and has worked on computational intelligence for a quarter century. He is especially interested in combining human factors and computational intelligence, so called Humanized Computational Intelligence. His lab is the center of interactive evolutionary computation research in the world.