"Advanced Design and Technologies for Human Science" Syllabus

Room 512 (near ground / Building 5 main entrance) 2016 Summer School

Date	Time	Instructor	Topic	Abstract
30/8 (Tue)	08:40 - 10:10	Ito (Hiroshi)	1. An Introduction to Biological Rhythms	The topic of this lecture is oscillatory phenomena in nature. We will see examples of biological rhythms; circadion rhythms, firefly flashing, heart beating, neural firing, and so on. In particular, we will focus on synchronization of oscillators from a mathematical point of view.
30/8 (Tue)	10:30 - 12:00	Nouno	2. Computer Graphics	Making 3D initial using 3D-CAD and a 3D printer.
31/8 (Wed)	08:40 - 10:10	Remijn	3. An Introduction to 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 through the senses.
31/8 (Wed)	10:30 - 12:00	Shiraishi	4. Auditory Evoked Potentials	Following an introduction of basic anatomy of the auditory pathway, we learn the classification of the auditory evoked potentials (AEPs), recording techniques of AEPs and clinical applications, such as infant auditory evaluations and diagnosis of central disorders.
1/9 (Thu)	08:40 - 10:10	Maeda	5. Environmental Ergonomics	1) Human environment system, 2) Human physiological regulation system to various environments, 3) Introduction of some studies for environmental adaptability and lifestyle.
1/9 (Thu)	10:30 - 12:00	Muraki	6. Ergonomics for all Ages and Abilities	1) The fact of the super aging society in Japan, 2) Social changes by population aging, 3) Importance of assisting devices and barrier-free environment in homes, 4) Design problems in the living environment and equipment for the elderly, 5) Examples of designs for the living environment and equipment for the elderly.
2/9 (Fri)	08:40 - 10:10	Ito (Hiroyuki)	7. Visual Illusions	Our visual world is not a copy of the physical world. Through a lot of visual illusions, we can learn how our brain works to construct the visual world that is virtually corresponding to the physical world. What these illusions imply is the main topic of this lecture.
2/9 (Fri)	10:30 - 12:00	Nakajima	8. Auditory Illusions	Some newly discovered auditory illusions will be demonstrated, and their implications to the study of auditory mechanisms will be explained. The role of auditory perception in our daily life will also be discussed. Mutual discussion based on perceptual experiences and step-by-step reasoning will be encouraged.
5/9 (Mon)	08:40 - 10:10	Kozaki	9. Lighting Environment	Light is well known to be a powerful synchronizer of our circadian rhythm. It also affects various kinds of psychophysiological aspects such as melatonin secretion, awareness, etc. This class introduces the psychophysiological effects of light and its characteristics.
5/9 (Mon)	10:30 - 12:00	Ueda	10. Speech Analysis and Synthesis: How can we perceive Degraded Speech?	One of the characteristic aspects of speech is that it is extremely robust against various distortions and loss of information. It has been revealed that we can perceive speech with only a small number of channels, which transmit just power fluctuations. We will explore how these channels can be connected with basic functions of the auditory periphery.
6/9 (Tue)	08:40 - 10:10	Hiramatsu	11. Evolution of Color Vision	Why do we have color vision? Do humans have the best color vision in the animal kingdom? The characteristics of the human color vision system resulted from random genetic changes and adaptations of organisms to their environment, i.e. evolution. In this lecture, we will explore how our color vision has been shaped through evolution.
6/9 (Tue)	10:30 - 12:00	Seno	12. What is Vection?	In this lecture, visually induced self-motion perception (vection) will be fully explained. A lot of important studies of vection will be introduced.
6/9 (Tue)	13:00 - 14:30	Takagi	13. Interactive Evolutionary Computation	Following a basic introduction of fuzzy systems, neural networks, and evolutionary computation (EC), we learn of of EC's applications, interactive EC (IEC), which optimizes a target system based on human subjective evaluations. Through many IEC applications in a wide variety of areas, we learn its wide applicability and consider how to apply IEC to our research. Slides and a tutorial paper can be downloaded athttp://www.design.kyushu---u.ac.jp/~takagi/
8/9 (Thu)	13:00 - 16:00	participants	14-15. Presentations of field of study and lab work	All participants are required to make a short presentation about their field of study and topic of research at their home university, as well as a short overview of their lab work during the Summer School. Students already enrolled in the Human Science course are required to give a presentation about their field of study and write a report on the "Advanced Design and Technologies for Human Science" lecture course and how it relates to their research (>1000 words English).
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