

SYLLABUS

Section	Contents	
Course Type	Optional	
Course Number	EE837	
Course Name	English	Special Topics in Signal Processing: Neuro-Robotics
	Korean	
Instructor	Jun Tani	
Prerequisite		
Lecture : Lab : Credit	(3:0:3)	Term : Fall
Course Description	<p>The primary objective of this course is to explore the synthetic modeling approach to understand brain-based mechanisms for learning and generating cognitive behaviors. For this purpose, the course will offer introduction of neuro-robotics studies as well as neuroscience literatures related to brain mechanisms for behavior generation. In addition, the course will offer hand-on experiences on experimenting neuro-driven learnable robots. The course will gain a good understanding on mechanisms for learning and generating cognitive behaviors both in biological brains and artifacts. Evaluation is based on the term project and active class participations. Senior undergraduate students might be able to take the course with permission of the course instructor.</p>	
Textbook	Course handouts.	

•Tentative Timetable

Week	Main Contents	Reference
1	General introduction & key concepts in neuro-robotics	
2	Braitenberg vehicle	
3	Intro to brain mechanisms for action generation	
4	Basics in neurons and circuits	
5	Artificial neural network models	
6	Functional roles in the motor cortex and cerebellum	
7	Sensory-motor coordination in adaptive behavior robots	
8	Term Project Proposal	
9	Forward and inverse models and their robotics applications	
10	Functional roles in the parietal cortex	
11	Learning of primitive behaviors by robots	
12	Mirror Neurons	
13	Mirror neuron modeling and robotics experiments	
14	Neuroscience for consciousness and free will	
15	Neuro-robotics accounts for consciousness and free will	
16	Term Project Report	

Instructor : Jun Tani Chairperson :