Dragon Star Short Course (Summer 2005)

Machine Perception

Syllabus

Time: Monday through Friday, Aug. 15-19, 2005

Lectures: 8:30-11:30

Discussions: 1:30-3:30

Place: TBA, Peking University

Instructor: Prof. DeLiang Wang; Email: dwang@cse.ohio-state.edu

URL http://www.cse.ohio-state.edu/~dwang

Assistant: Dr. Dingsheng Luo, Peking University, dsluo@cis.pku.edu.cn

Course Description:

A graduate-level introduction to fundamental concepts and algorithms of machine perception. Topics include visual and auditory perception, computational vision and audition, pattern recognition (face and speech), and machine learning.

Course Objectives:

Upon completion of the course, the participant will have gained:

- Deeper understanding on machine perception
- Recent techniques and algorithms in machine perception
- How to apply machine perception to solve real-world problems

Course Material:

Lecture notes plus selected papers from the literature

Evaluation:

A project within the scope of this short course. Examples may be (but not limited to)

- A computer implementation of a specific algorithm or duplication of a specific system (from a paper)
- A proposal (or an original idea) and some initial results

- A detailed analysis or an in-depth review on a specific topic

A short paper summarizing the project should be 1500-2000 (3-4 pages) words in length, and is due on Friday morning (and returned on Friday afternoon)

Tentative Schedule

Day	Topics
Monday	General introduction and vision • Marrian information processing framework • Visual perception • Computational vision in Marrian framework
Tuesday	Image modeling and analysis • How to characterize an image? • Image modeling • Spectral histogram model

Wednesday	Real-world audition and computational auditory scene analysis
	• Sound separation problem
	• Human auditory scene analysis
	• Computational auditory scene analysis
	  o Monaural segregation
	  o Binaural segregation

Thursday	Pattern recognition and machine learning • Face recognition • Speech recognition • Multilayer perceptron learning
Friday	Catch up and overall discussion • Brain mechanisms for perception

Participant Information

Due: Monday Afternoon

Name: _____

Email Address: _____

Department & Institution: _____

Training Level: _____-th year Graduate or Undergraduate Student

or Professional (Position Title: _____)

Detailed Contact Info: _____

Areas of Interest: _____