ECE511/PSY511 Psychophysics

A Joint Offering by
School of Electrical and Computer Engineering
and **the Department of Psychological Sciences**
at Purdue University

Instructor:
Prof. Hong Z. Tan, ECE

Outline for Lecture 1

- **About the instructor**
- **About this Course**
- **What is Psychophysics?**
- **About the students**

Instructor(s)

- **Prof. Hong Z. Tan**
  Professor
  School of Electrical and Computer Engineering
  School of Mechanical Engineering (courtesy)
  Department of Psychological Sciences (courtesy)

- **Prof. Zygmunt Pizlo**
  Professor
  Department of Psychological Sciences
  School of Electrical and Computer Engineering (courtesy)

This Course

- **History**
- **Why should engineers take this course?**
- **Why should psychologists take this course?**

- **Course Information/Policy**
- **Course Website**
  - **On-Line experiments**
  - **Lecture notes**
  - **Using humans as research participants**

What is Psychophysics?

Definition

Psychophysics refers to the methodology of studying perception: designing experiments, formulating models

- **Main questions**
- **Answers/conjectures**
- **Demos**

Nature of perception

- **Is perception about acquiring knowledge (about the environment) or about receiving sensory information only (like feeling pain)?**
- **Is perception an active process (like thinking) or passive?**
- **Do we have conscious access to all perceptions, or some perceptions are unconscious?**
- **Do perceptions adequately reflect the physical and geometrical properties of stimuli (i.e., are perceptions veridical)?**

Science of perception

- **Scientific methodology requires that the phenomena under study are 'public'. Physical and biological phenomena are 'public', and behavioral responses are 'public', too. But perceptions, like all mental events, are 'private'. Can we reliably make inferences about perceptions from behavioral responses? Can we make inferences about all perceptions?**

- **How much do we have to know about the underlying physical stimulus, in order to 'measure' percepts?**

Origin of perception

- **Are perceptual mechanisms innate or learned?**
- **Can perceptual mechanisms be modified?**
- **Do we all perceive things the same way?**

Mind-body problem

- **How to establish the relation between perceptions and the underlying brain mechanisms?**
- **How much can we learn about perceptions by studying the brain?**
- **How much can we learn about the brain by studying perceptions?**
- **Are perceptions mere replicas of physical stimuli? Can perceptions be explained just by analyzing physical stimuli?**

Some Answers/conjectures

- **We have perceptual systems *in order* to obtain accurate and reliable knowledge about the environment. Perceptions are passive.**
- **Psychophysical experiments allow making inferences about *many* aspects of perception.**
- **Most (if not all) perceptual mechanisms are *innate*. As a result we all perceive things the same way.**
- **Solving the mind-body problem requires linking propositions. Brindley's (1960) *class A* and class B observations (experiments).**

Videos: Change Blindness

- What you see (perception) ≠ What you are looking at (stimulus)

Students

- Find a neighbor and ask about
  - (First) Name
  - Major
  - Reason for taking this course

- Break
  - Introduce your neighbor after the break