

ECE511/PSY511 Psychophysics

Fall 2005

*A Joint Offering by ECE and Psychology
Purdue University*

Lectures (tentative):

T/Th 10:30-11:45 am (MSEE184)

Instructor:

Prof. Hong Z. Tan

Textbook

- **“Detection Theory: A User’s Guide,” by Neil A. Macmillan and C. Douglas Creelman (2nd edition)**

Handouts

- **Signup Sheets**

(Due to Prof. Tan at the end of lecture)

- **Course Information / Policy**

Outline for Today's Lecture

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

Instructors

- **Prof. Hong Z. Tan**

Associate Professor

School of Electrical and Computer Engineering

School of Mechanical Engineering

- **Prof. Zygmunt Pizlo**

Professor

Department of Psychological Sciences

This Course

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

- **Course Information/Policy**
- **Course Website**
 - ◆ **Experiments**
 - ◆ **Lecture notes**
 - ◆ **Using human beings as research subjects**

Students

- Find a neighbor and ask about
 - ◆ Name
 - ◆ Major
 - ◆ Reason for taking this course
- Introduce your neighbor

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) \neq What you are looking at (stimulus)**