What the course is about

- The BIG question of Cognitive Science

- How shall we explain or understand processes like thinking, reasoning, speaking, decision making, planning, and so on?

- How did cognitive science get where it is?

- Where can cognitive science go from here?
What is mind?

- What is special about minds (even your cat’s mind) as opposed to inanimate objects?
- And what is special about human minds compared to other animal minds?
- Mindfulness is just matter… nicely orchestrated
Where is the mind?

- Many cognitive scientists say that the mind is in the brain. Or they say that the mind is what the brain does.
- Is this right?
- Is it the whole story?
The mind in the brain

Understanding cognition is largely understanding the dynamic flow of information through the system

(Van Essen Lab)

From a WA talk by Jochen Triesch 2003
Is the mind in the nervous system?

- Is a brain in a vat really a good model of the human cognitive system?
- The brain gets input from and sends output to the central nervous system.


http://www.csus.edu/indiv/m/mccormickm/BrainsInAVat.html
Perhaps we need to add the body to explain the mind

Consider two example situations

**Situation 1:** driving your car while having a conversation

**Situation 2:** reading out aloud while tapping your feet to the rhythm of some music

*Same input/output modules, yet different information flow!*

From a WA talk by Jochen Triesch 2003
The mind in the interaction of the body with the world

- The body is in a physical world, and the structure of that world interacts with the body and the nervous system and the brain to shape what we think and how we think.

Photo: Ron Church, The Surfer’s Journal Volume 9, No. 4
Mind in the interaction of the brain and body with a culturally constructed world

- Human life is lived in complex social environments that are filled with cultural artifacts.
- Our cognition and our mindfulness emerge from the interactions of our brains and bodies with this socio-cultural world.

Photo: Edwin Hutchins, 2003
Cognitive science as a slice of scientific cake
Distributed Cognition

- Cognition emerges from the interaction of many components
- Cognitive events take place at many levels of organization
  - Brain area
  - Whole brain
  - Whole person
  - Group of persons
Course plan

1. Overview of distributed cognition. Thinking about the science of thought.
3. An extended case study of distributed cognition.
Mindware

Andy Clark
Philosopher of Cognitive Science
The development of cognitive science

- Andy Clark’s combination history and critical reflection.
- Mindfulness as (some sort of) computation.
- Recent wrinkles
  - Embodiment
  - Robotics
  - Dynamics
  - Interaction with the material world
Cognition in the Wild

Edwin Hutchins
An extended case study of distributed cognition

- Ship navigation
- How institutions think
- Where is the computation?
- Embodied cognition in cultural context
- Cognitive properties of groups
- Individual and institutional learning
- The costs of ignoring culture when studying cognition
Instructors

- **Professor Edwin Hutchins**
  - ehutchins AT ucsd DOT edu
  - Th 11:00 - 11:50, CSB 175

- **TAs**
  - **Morana Alač**, malac AT cogsci DOT ucsd DOT edu
  - **Nathaniel Smith**, njs AT popbox DOT com

- **IAs**
  - **Cody Frew**, cfrew AT ucsd DOT edu
  - **Joachim Lyon**, jlyon AT ucsd DOT edu
  - **Christopher Martin Hall**, cmartinh AT ucsd DOT edu
What you are expected to do

- Read and think
- Consult materials on the library web page and take a quiz on plagiarism
- Take a midterm exam in class
- Write a research paper
- Take a final exam on Tuesday of finals week
Research Paper

- An eight step progression from vague idea to well researched and carefully written research paper.
- Assignments on the course web site.
- Additional resources are available via the social sciences library at http://sshl.ucsd.edu/instruction/cogsci102a/index.html#
Final Exam

- Date: Tuesday, December 6, 3:00pm – 6:00pm.
- Place: Here in CTR 105
- Format: Multiple choice
- Study guides: Last year’s midterm and final exams will be available on the course web site. You may wish to consult them periodically during the quarter.
Basis of your Grade

- Midterm 10%
- Research paper (8 assignments) 65%
- Final Exam 25%

Total 100%
How to Succeed in this Course
Do the Readings

- Keep up with the reading schedule
- Read carefully and critically
- Use the guidance provided on the class website
- THINK ABOUT WHAT YOU ARE READING!
Get a good Dictionary and use it

- Meanings
- Word choice
- Usage conventions
- Spelling

Language is a social tool. Knowledge is power. Workout and get strong
The American Heritage Dictionary of the English Language
Spend some Time on the Course

- The registrar expects you to work 12 hours per week for a 4 unit course!
Come to Lecture Sessions

- Clean, sober, and awake
- Do NOT sleep in class
- Cell phones OFF!
- Be here. No IM or web surfing in class
- If you don’t understand something, ASK for clarification.
Go to Section

- Discuss questions
- Clarify issues
- Get ideas for and help with your research paper
- Prepare for the exams
Do the Assigned Work

- Start ahead of time
- Be sure you understand each assignment
- Make your papers easy to read and understand
- PROOFREAD! Check spelling and grammar
- Turn projects in ON TIME
Visit Office Hours

- We are here to help you
- You (or your parents) are paying for our time
- Explore ideas
- Clarify assignments
Do NOT attempt to CHEAT!

- Do your own work. You are encouraged to talk to other students about ideas, but do not “borrow” material from other students.
- Do NOT look at your neighbor’s paper during the exams.
Be Creative

- Learning can be fun.
- This course is about ideas, not the memorization of facts.
- Ideas never stand alone. They are always related to other ideas. Explore the world of ideas.
Appreciate the Challenge of Cognitive Science

- Many of the central questions in this field are still unanswered.
- Most of them relate directly to your daily life in some way. Be alert for connections to your own experience.
For Tuesday

- Buy *Cognition in the Wild* and *Mindware* (Both available at the bookstore)
- Review the material on the course web site: http://hci.ucsd.edu/102a/
- In particular, consult reading guidance for Tuesday’s assignment on web site schedule page
- Read these two papers (available on the web site)
  - Mitch Resnick “Learning about life”
  - Edwin Hutchins, “How a cockpit remembers its speeds”
Thinking about the science of thought.

- How science works (in general).
- The role of unexamined assumptions and presuppositions.
- What are the unexamined assumptions of cognitive science?
- How can we make them visible?
- Can we free ourselves from them?
Cognitive Science 102A
Distributed Cognition

Professor Edwin Hutchins

http://hci.ucsd.edu/102a