

What is computing & information science?

And what will we do here?

<http://www.cs.cornell.edu/courses/cs1305>

Today's agenda

- What is CIS?
- Course mechanics
- Computing in society

Lunch and extra time to activate NetID, get textbook and other supplies, register (for international students), etc.

College admissions workshop

Computing is the study of natural and artificial information processes

- Information – data ...
- Information process – the discovery (generation), storage, retrieval, and transmission of information
- Artificial – human built; simplified representation of a complex (natural) system or item
- Natural – biology; natural language


Common sense conceptions of “information”

- Knowledge derived from study, experience, or instruction
- Be something or be about something, (a message, a substance, a concept)
- Be true: a falsehood is mis-information, not information itself
- Can be documented and later accessed

H. Rosenbaum, Indiana University


Have you used a computer since arriving on campus?

What (where) are these computers?



A rapidly changing field...

- 40 years ago:
How to make a computer useful
- Today:
Applications



NATIONAL ACADEMY OF ENGINEERING
OF THE NATIONAL ACADEMIES

Engineering's Grand Challenges

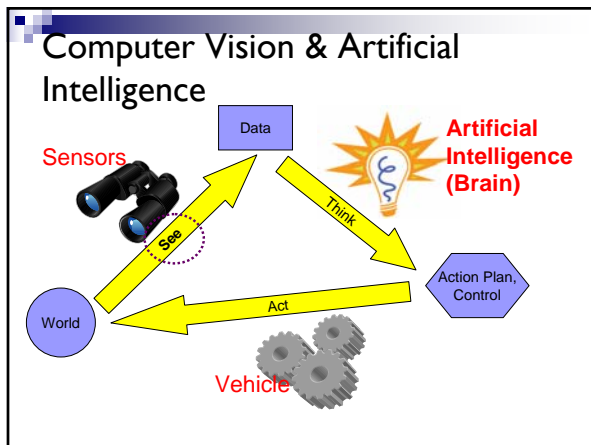
WHAT DO YOU THINK? Click on the engineering challenge you think is the most important:

Make solar energy economical	Provide energy from fusion	Develop carbon sequestration methods
Manage the nitrogen cycle	Provide access to clean water	Restore and improve urban infrastructure
Advance health informatics	Engineer better medicines	Reverse-engineer the brain
Prevent nuclear terror	Secure cyberspace	Enhance virtual reality
Advance personalized learning	Engineer the tools of scientific discovery	

*Many grand challenges relate to **computing***




Grand challenges in science & engineering from 10 years ago...

- Prediction of change in weather, climate, global environment
- Human genome project
- Autonomous vehicle 
- Speech recognition
- Computer vision
- Verified software
- Information retrieval



Computer Vision

The diagram shows **World** being observed by **Sensors** (binoculars) to produce **Data**. This data is then used for various applications:

- Medical imaging (MRI) 
- Object recognition 
- Image correction 

Computer Graphics

- Digitally synthesize and manipulate visual content
- Applications in entertainment, medicine, scientific visualization, military training

Animating Water Bottle Recycling Rates
Doug James
Cornell University

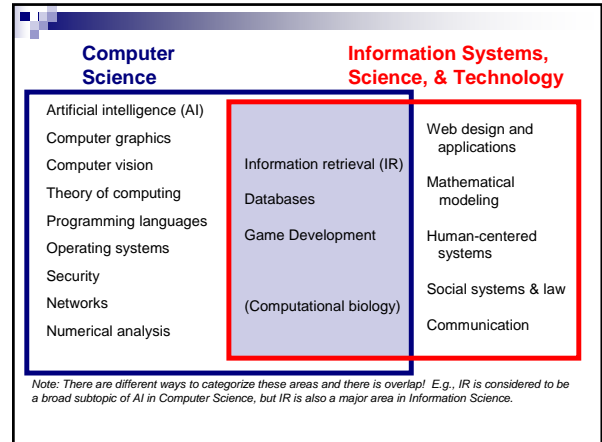
Artificial Intelligence ... beyond robotics

- Machine learning
 - Spam filtering
- Natural language processing
 - Sentiment analysis
 - Machine translation
- Information retrieval
 - Library catalog search
 - Google search

Related to search technology, there are many other topics of interest and importance...

- Database
- Trustworthy system, security, privacy
- Human-computer interaction
- Web design and applications
- Policy and law

Information Science



Our goals

- Learn about the broad field of computing & information science
- Analyze the social, legal, and ethical issues in computing today
- Learn about some cool CS/IS methods behind popular technologies (e.g., Google search)
- Learn some computer programming
- Discover the programs of study leading to careers in CIS

What will we cover? Lots...

Four main threads

- Social, ethical, and legal issues in computing
- CS Application areas: artificial intelligence, machine learning, information retrieval
- IS Application areas: information architecture, human-computer interaction, information retrieval
- Computer programming: graphics, media manipulation, 3-d modeling

What will you do?

- Participate in discussion, lecture, lab
- Read, reflect, and write...
- Develop computer programs
 - Manipulate digital media, build a spam classifier
- Perform a usability study on a real website
- Submit a term paper (and debate)
- Present a final project

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What determines your grade?

■ Participation	10%
■ Lab exercises and homework	45%
■ 2 Tests	20%
■ Term paper (and debate)	20%
■ Final presentation	5%

Logistics

■ Typical locations:

- M-F 9:00-10:15 PH403
- M-F 10:30-11:45 PH403
- M-R 1:15-2:45 UPI09 or ACCEL lab
- M-R 3:00-4:45 ACCEL lab

■ Office hours:

- MWR 5-6p, TW 7-8p, F noon-1p