

CSE 516A: Multi-Agent Systems

Introductory Lecture
Prof. Sanmay Das

Plan for today

Welcome & introductions

What is this class about?

Class logistics

What is this course?

Multi-agent system: a system where multiple autonomous entities with different information sets and goals interact.

Let's see some examples of the kinds of things we're going to study

**Web**

News

Maps

Images

Videos

More ▾

Search tools

About 323,000,000 results (0.57 seconds)

Duke-NUS Medical School - Duke-NUS.edu.sg

Ad www.duke-nus.edu.sg/ ▾Be A **Medical** Leader of the 21st Century. Apply For Our Programs Now

University of Phoenix® - Phoenix.edu

Ad www.phoenix.edu/HealthCare/ ▾

Make a Difference. College Health Care Programs for the 21st Century.

Caribbean Medical School - umhs-sk.org

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Small Class Sizes. Financial Aid. \$50 Million Campus. 93% USMLE Pass

Medical Schools - US News & World Report

www.usnews.com/...schools/top-medical-scho... ▾ U.S. News & World Report ▾See the top ranked **medical schools** in primary care and research and find the best **medical school** for you at US News.

Harvard Medical School - Harvard University

hms.harvard.edu/ ▾ Harvard Medical School ▾

Official site providing an overview of academic and research programs, resources, news and events, and links to other web sites located throughout the Harvard ...

Best Medical Schools: Research - US News & World Report

grad-schools.usnews.rankingsandreviews.com ▾ Graduate Schools ▾See the top ranked **medical schools** for research at US News. Use the best **medical school** rankings to find the best research program for you.**Ads**

University of Nicosia

nicosia.sgul.ac.cy/Apply-Now ▾**Medical** Degree From St. George's
2015 Admissions Now Open!

UW School of Medicine

www.uwmedicine.org/ ▾Ranked Number 1 in Primary Care
by US News World Report

Aruba medical school

www.aureusuniversity.com/ ▾Most Affordable, Highest Rated. No
Mcat, US/Canada Residcy, USMLE Prep

Top Caribbean Med School

www.avalonu.org/ ▾Internationally Accredited. Best
clinical rotations. MCI approved.

UAG Medical School

www.uag.edu/ ▾Program of **Med.** in the Community
hands-on practice since year 1.

Sponsored Search Auctions

Each sponsored search listing occupies a slot

Advertisers pay per-click

Google's problem: how to allocate slots

Advertiser's problem: how much to bid for a click

Key idea: must reason about the actions of other (intelligent) agents

Aside: Why does Google clearly delineate sponsored results?

Reasoning about others

Can I get two volunteers to play a game?

B's action

A's
Action

	Cooperate	Defect
Cooperate	1 year, 1 year	3 years, Free
Defect	Free, 3 years	2 years, 2 years

Time in prison for A, B

Golden Balls 1

Golden Balls 2



A medical career starts with finding the program that best fits your needs. With *U.S. News* research, narrow your search by location, tuition, school size, and test scores.

► For full rankings, MCAT scores, and student debt data, sign up for the [U.S. News](#)

Research rank	School name	Tuition	Total medical school enrollment
#1	Harvard University Boston, MA	\$49,875 (full-time)	700
#2	Stanford University Stanford, CA	\$47,343 (full-time)	461
#3	Johns Hopkins University Baltimore, MD	\$44,100 (full-time)	479
#4	University of California—San Francisco San Francisco, CA	\$31,134 (in-state, full-time); \$43,379 (full-time) (out-of-state)	648
#4	University of Pennsylvania (Perelman) Philadelphia, PA	\$47,090 (full-time)	646
#6	Washington University in St. Louis St. Louis, MO	\$52,020 (full-time)	478

Incentives in voting

Polling for “top medical school”

3 candidates: Harvard, UCSF, JHU, WUSTL

Method: Rank candidates, assign 3,2,1,0 points

Person 1: Harvard > UCSF > WUSTL > JHU

You think: WUSTL > Harvard > UCSF > JHU

What would you do?

What happens when you graduate?

Apply to residencies

Alice	WUSTL > UCSF > Harvard	WUSTL	Chris > Alice > Bob
Bob	WUSTL > Harvard > UCSF	UCSF	Alice > Chris > Bob
Chris	Harvard > WUSTL > UCSF	Harvard	Alice > Chris > Bob

Suppose we match (Alice, UCSF), (Bob, WUSTL), (Chris, Harvard)?

Alice and WUSTL would rather be together than with their assigned matches: **unstable**

What about: (Alice, WUSTL), (Bob, UCSF), (Chris, Harvard) ?



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Medical school

From Wikipedia, the free encyclopedia

"Med school" redirects here. For the experimental music label, see [Hospital Records](#).



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- This article **needs additional citations for [verification](#)**. (*April 2013*)
- This article **may require [cleanup](#) to meet Wikipedia's [quality standards](#)**. The specific problem is: **poorly worded**. (*April 2013*)

See also: [Medical education](#) and [List of medical schools](#)

A **medical school** is a [tertiary educational](#) institution—or part of such an institution—that teaches [medicine](#), and awards a professional degree for physicians and surgeons. Such degrees include the [Doctor of Medicine](#) (MD), [Doctor of Osteopathic Medicine](#) (DO), or [Bachelor of Medicine, Bachelor of Surgery](#) (BMBS, MBBS, MBChB). Many medical schools offer additional degrees, such as a [Doctor of Philosophy](#), [Master's degree](#), a [physician assistant](#) program, or other post-secondary education.

Medical schools can also employ medical researchers and operate hospitals. The entry criteria, structure, teaching methodology, and nature of medical programs offered at medical schools vary considerably around the world. Medical schools are often highly competitive, using standardized [entrance examinations](#) to narrow the selection criteria for candidates.



Wikipedia and Peer Production

Why should I contribute?

How is quality maintained?

Can it be subverted?

PredictWise

Predictions ▼

Results & Papers

Still to Come

POLITICS

2016 Presidential Election – Likelihood of Republican Nomination

Jeb Bush	28.4 %
Marco Rubio	12.7 %
Rand Paul	11.3 %

[See All »](#)

2016 Presidential Election – Likelihood of Democratic Nomination

Hillary Clinton	69.9 %
Elizabeth Warren	12.1 %
Joe Biden	3.5 %

[See All »](#)

2016 Presidential Election – Next President

Hillary Clinton	42.7 %
Jeb Bush	15.0 %
Marco Rubio	6.9 %

SPORTS

NCAAF 2014/15 – Winner

Oregon	65.7 %
Ohio State	34.3 %

2014-15 NFL – Likelihood to Win (Team)

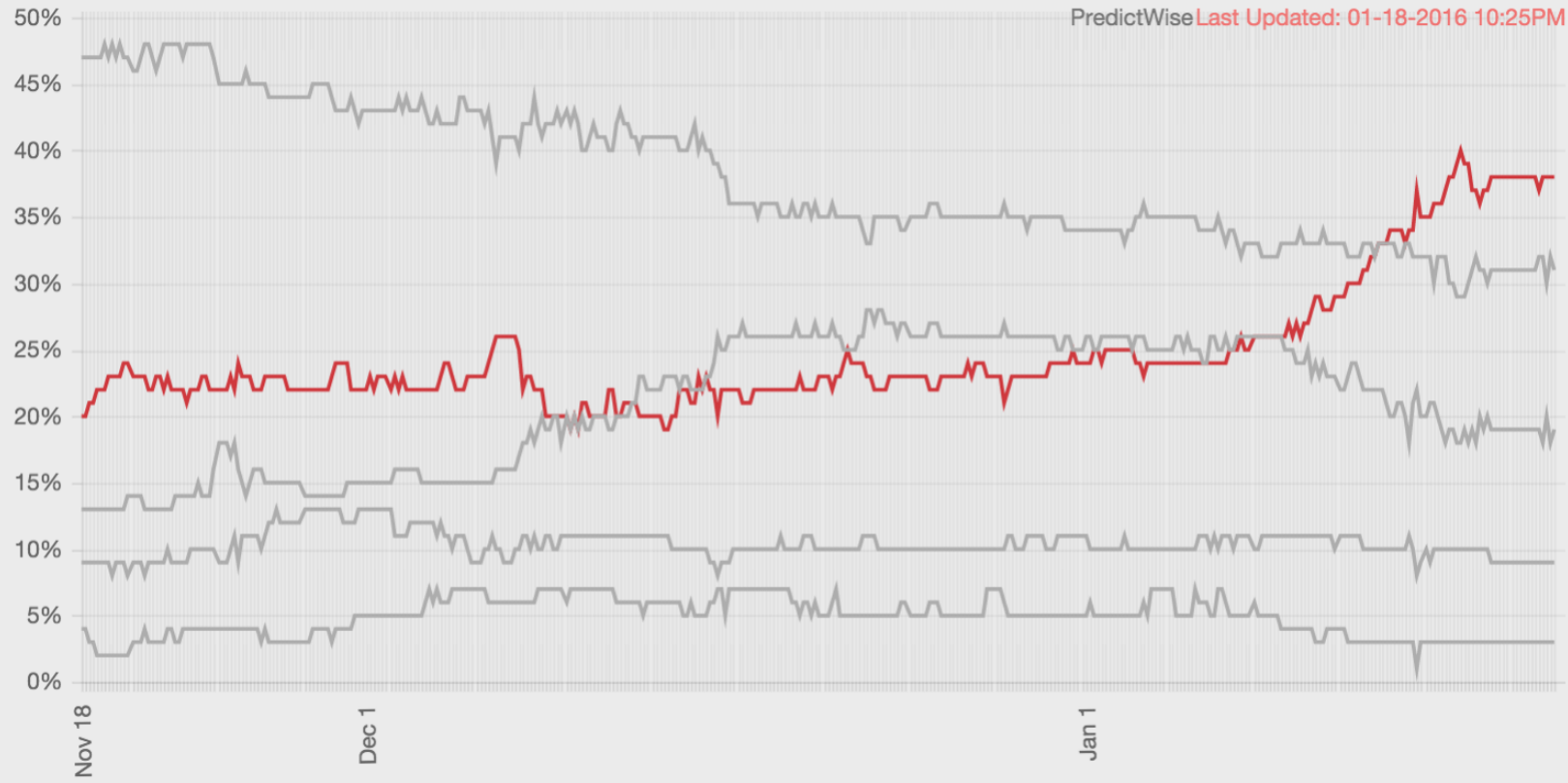
Seattle Seahawks	43.6 %
New England Patriots	33.0 %
Green Bay Packers	13.7 %
Indianapolis Colts	9.8 %

Cricket World Cup 2015 – Winner

Australia	26.1 %
South Africa	18.8 %
New Zealand	13.5 %
India	12.2 %

[See All »](#)

Donald Trump	38 %
Marco Rubio	31 %
Ted Cruz	19 %
Jeb Bush	9 %
Chris Christie	3 %



[FULL DATA](#)

2016 PRESIDENT DEM Nomination

Hillary Clinton	85 %
Bernie Sanders	14 %
Martin OMalley	1 %



2016 PRESIDENT Winner

Democratic	63 %
Republican	37 %



2015-16 SUPER BOWL Winner

Carolina Panthers	33 %
New England Patriots	31 %
Denver Broncos	18 %
Arizona Cardinals	18 %



Where do these numbers come from?

A prediction market

Applies principles from information aggregation in financial markets to predicting event probabilities

Why does it work? What's the meaning of a stock price?

Syllabus and course logistics

Let's look over the syllabus and discuss