learning Bayes through MOOC

——MOOC简介及应用

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zkwang2014@gmail.com

MOOC（Massive Open Online Courses）大型网络在线课程

- 1. 什么是MOOC？
- 2. MOOC的发展
- 3. MOOC的现状
- 4. MOOC在中国

- 案例：在Coursera学习Bayes

1. 什么是MOOC？

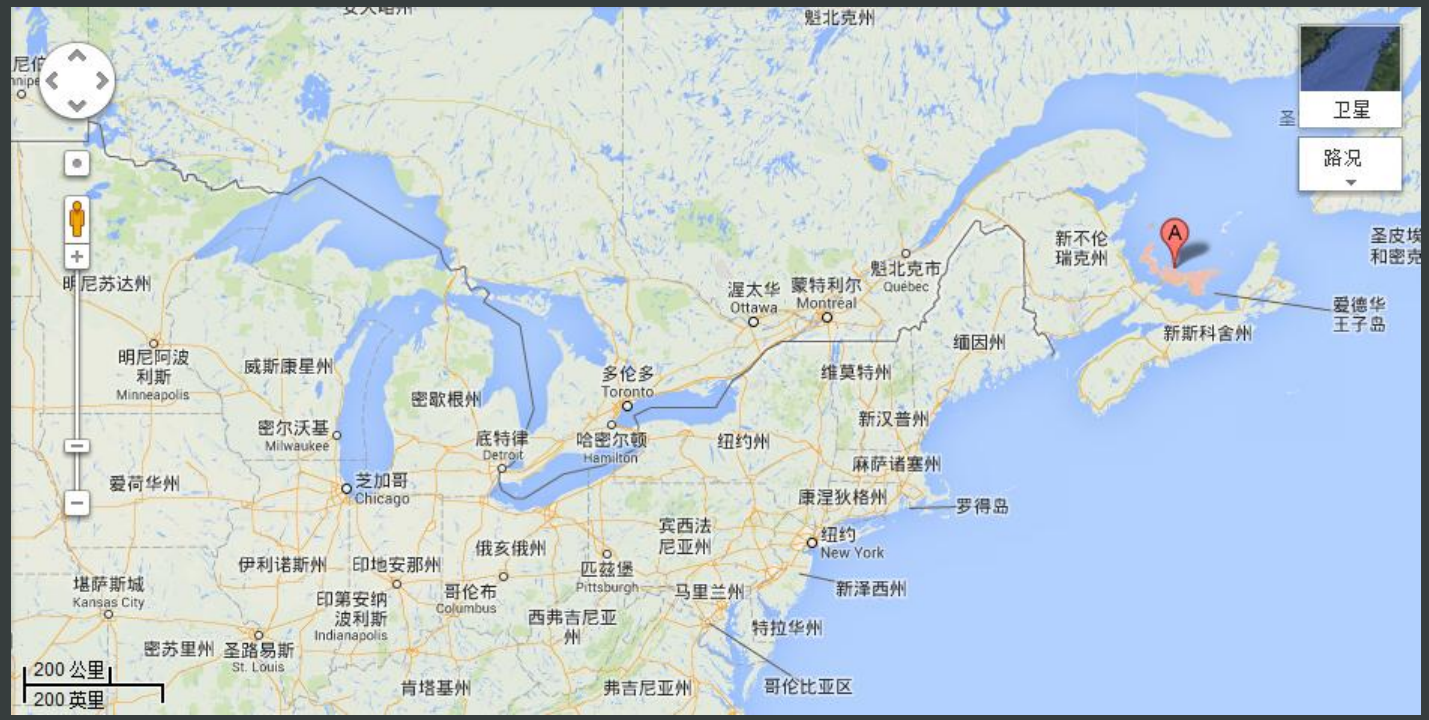
2. MOOC的发展　　3. MOOC的现状　　4. MOOC在中国　　案例：coursera/bayes

MOOC=Massive Open Online Courses=大型网络在线课程=“慕课”

2008年
加拿大爱德华王子岛大学（the University of Prince Edward Island）

网络传播与创新主任(Manager of Web Communication and Innovations) **Dave Cormier** 与
国家人文教育技术应用研究院（National Institute for Technology in Liberal Education ）高级研究员
Bryan Alexander

联合提出”MOOC”这个概念



MOOC是一种针对于大众人群的在线课堂，人们可以通过网络来学习在线课堂。MOOC是远程教育的最新发展，它是一种通过开放教育资源形式而发展来的。

——Wiki百科

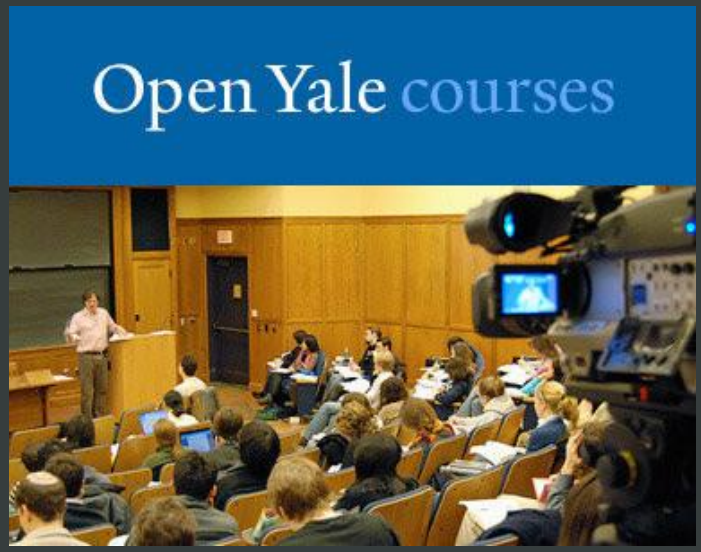
“MOOC”的提出者之一：Dave Cormier

2. MOOC的发展

1. 什么是MOOC？　3. MOOC的现状　4. MOOC在中国　案例：coursera/bayes

itunes U

University Open Course

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首页
国际名校公开课
中国大学视频公开课
TED
可汗学院
赏课
NEW
Coursera
公开课策划
文学 数学 哲学 语言 社会 历史 商业 传媒 医学/健康 美术/建筑 工程技术 法律/政治 宗教 心理学 教学/学习 学校/机构
可汗学院
金融博弈论
本课从最基本概念入手，结合实际讲述常见金融问题。
热门排行
最新课程
翻译进度
11-28 《几何学-角》翻译19-20集
11-28 《解读好莱坞》更新13-14集
11-27 《金融学》翻译31-32集
11-27 《精神病学病例研讨》翻译35-36集
11-26 《公元400年前古艺术》翻译5-6集
11-26 《钢之殇》更新3-4集
11-25 《代数习题课》翻译61-63集
11-25 《立大志》翻译18-20集
11-22 《脑筋急转弯》翻译6-7集
11-22 《建筑史》翻译9-10集
新版页面特性介绍
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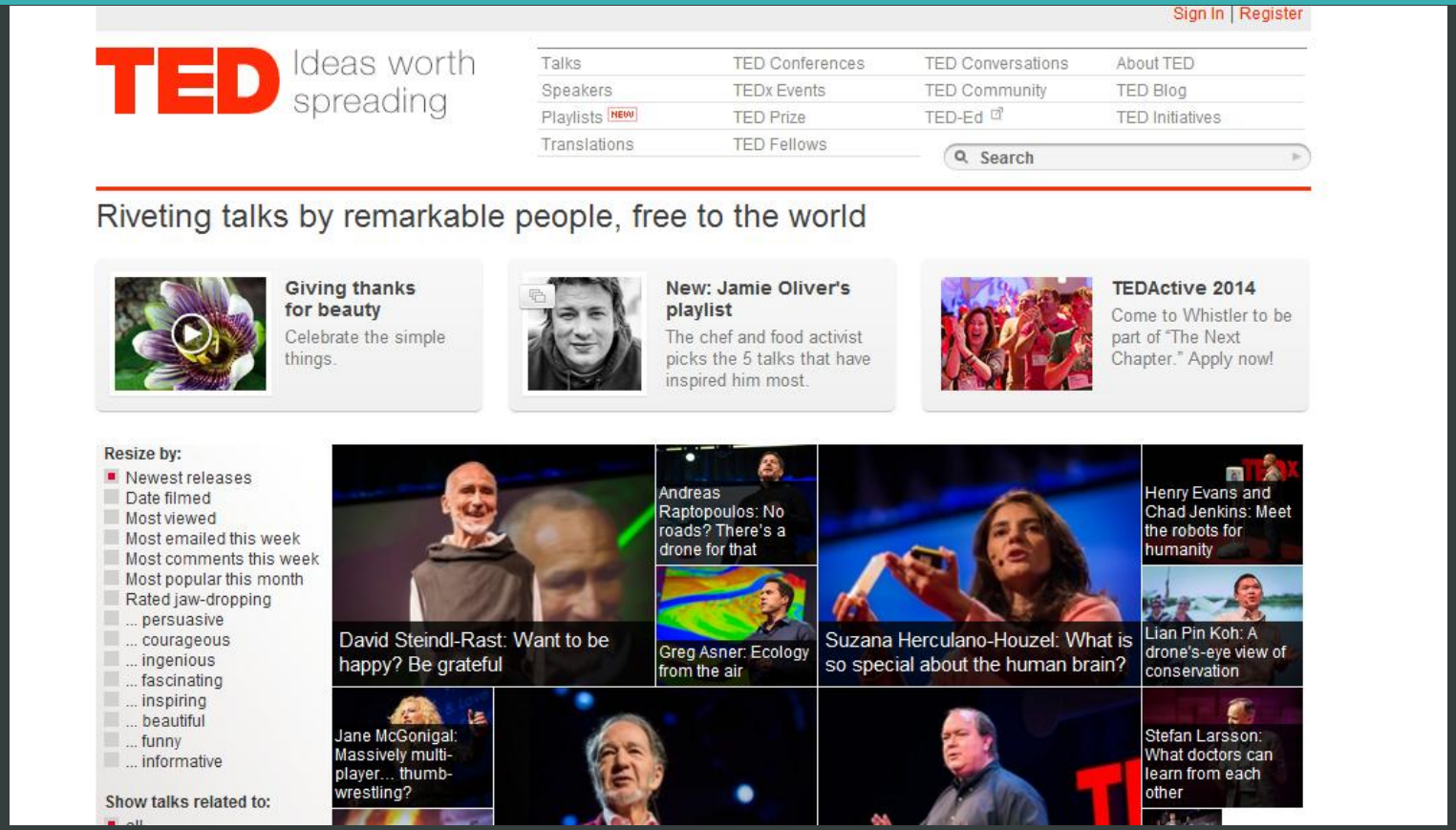
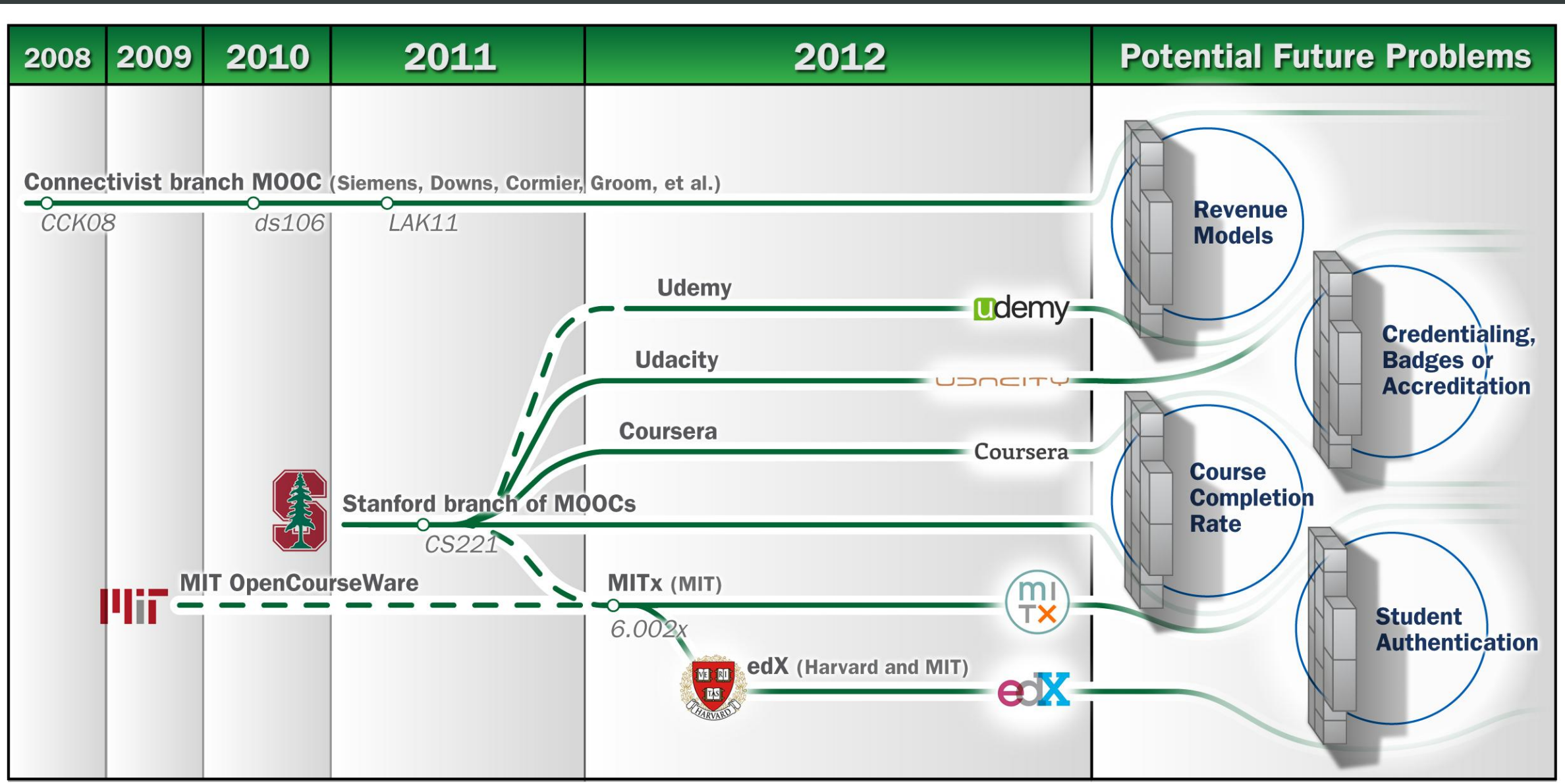


TED

TEDx
TUFE
x = independently organized TED event


2008
2009
2010
2011
2012
Potential Future Problems
Connectivist branch MOOC (Siemens, Downs, Cormier, Groom, et al.)
CCK08
ds106
LAK11
Udemy
Udacity
Coursera
Stanford branch of MOOCs
CS221
MIT OpenCourseWare
MITx (MIT)
6.002x
edX (Harvard and MIT)
Revenue Models
Credentialing, Badges or Accreditation
Course Completion Rate
Student Authentication

3. MOOC的现状

1. 什么是MOOC？　2. MOOC的发展　4. MOOC在中国　案例：coursera/bayes

三巨头

Udacity：

成立时间最早，以计算机类课程为主，课程数量不多，却极为精致，许多细节专为在线授课而设计。

edX：

哈佛与MIT共同出资组建的非营利性组织，与全球顶级高校结盟，系统源代码开放，课程形式设计更自由灵活。

Coursera：

目前发展最大的MOOC平台，拥有相近500门来自世界各地大学的课程，门类丰富，不过也良莠不齐。

其他平台

Stanford Online：

斯坦福大学官方的在线课程平台，与“学堂在线”相同，也是基于 Open edX 开发，课程制作可圈可点。

NovoED：

由斯坦福大学教师发起，以经济管理及创业类课程为主，重视实践环节。

FutureLearn：

由英国12所高校联合发起，集合了全英许多优秀大学，不过课程要等到明年才会大批量上线。

Open2Study：

澳洲最大MOOC平台，课程丰富， 在设计和制作上很下工夫，值得一看。

iversity：

来自德国的MOOC平台，课程尚且不多，不过在课程的设计和制作上思路很开阔。

MOOCs

edX: *Harvard-MIT (Anant Agrawal), $60M, Dec 2011*

+18 partners, over +24 courses, +1 M students https://www.edx.org/

http://web.mit.edu/newsoffice/2012/mit-harvard-edx-announcement-050212.html

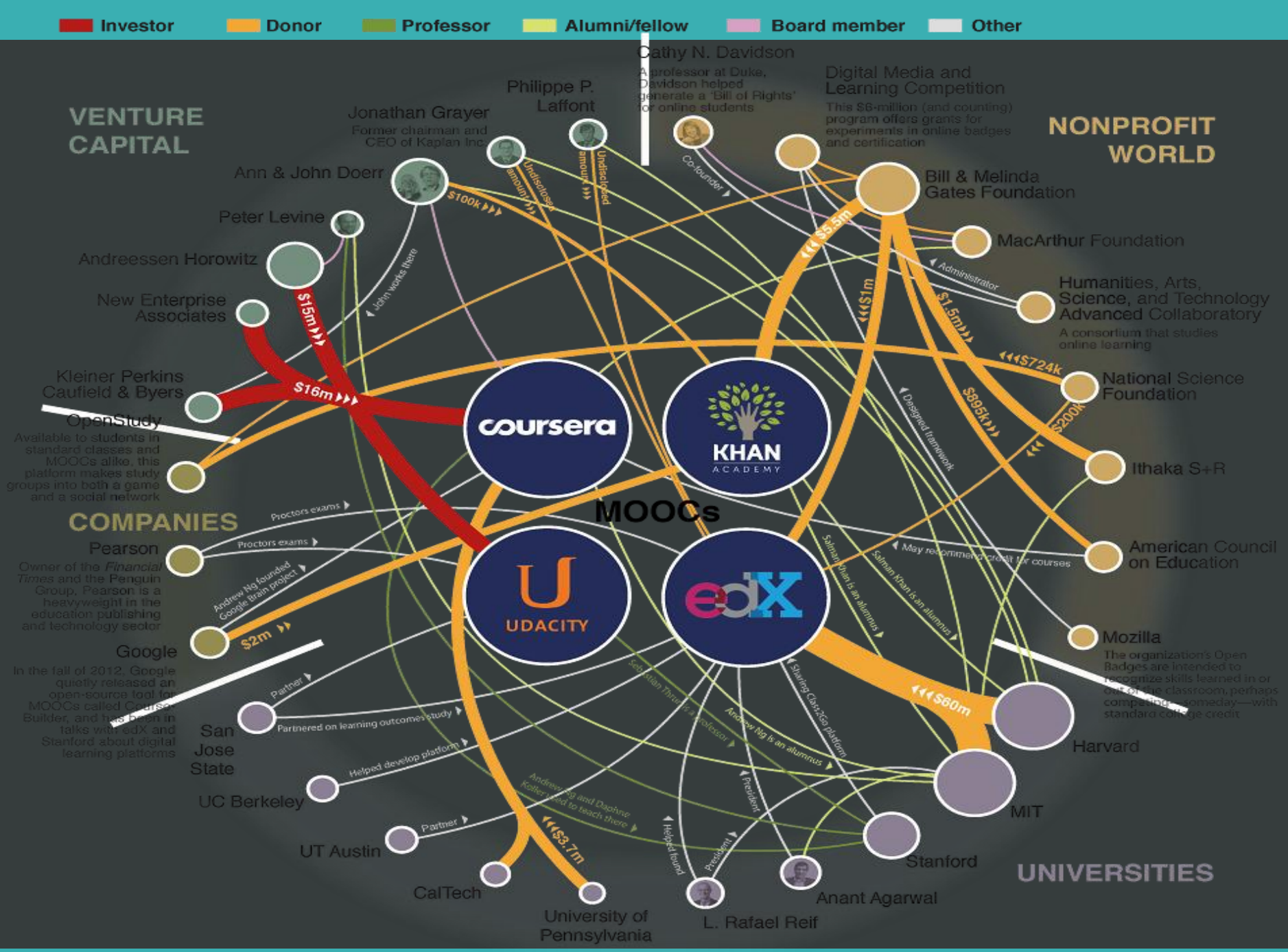
Udacity: *Ex-Stanford (Sebastian Thrun), Feb 2012*

https://www.udacity.com/

$15.3 M, +20 courses,
400,000 students

Coursera: *Stanford (Daphne Koller, Andrew Ng)*

April 2012, $16 M VC, 33 universities, +200 courses, +2.5 M student from 196 countries, Feb 2013 https://www.coursera.org/

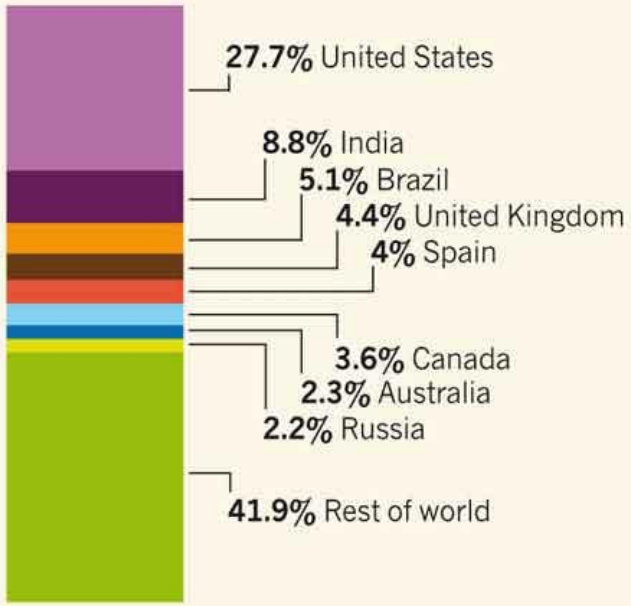

Investor
Donor
Professor
Alumni/fellow
Board member
Other
VENTURE CAPITAL
NONPROFIT WORLD
COMPANIES
UNIVERSITIES
MOOCs
coursera
KHAN ACADEMY
UDACITY
edX
Cathy N. Davidson
A professor at Duke, Davidson helped generate a 'Bill of Rights' for online students
Digital Media and Learning Competition
This $6-million (and counting) program offers grants for experiments in online badges and certification
Philippe P. Laffont
Jonathan Grayer
Former chairman and CEO of Kaplan Inc
Ann & John Doerr
Peter Levine
Andreessen Horowitz
New Enterprise Associates
Kleiner Perkins Caufield & Byers
OpenStudy
Available to students in standard classes and MOOCs alike, this platform makes study groups into both a game and a social network
Pearson
Owner of the Financial Times and the Penguin Group, Pearson is a heavyweight in the education publishing and technology sector
Google
In the fall of 2012, Google quietly released an open-source tool for MOOCs called Course Builder, and has been in talks with edX and Stanford about digital learning platforms
San Jose State
UC Berkeley
UT Austin
CalTech
University of Pennsylvania
Bill & Melinda Gates Foundation
MacArthur Foundation
Humanities, Arts, Science, and Technology Advanced Collaboratory
A consortium that studies online learning
National Science Foundation
Ithaka S+R
American Council on Education
Mozilla
The organization's Open Badges are intended to recognize skills learned in or out of the classroom, perhaps competitive someday—with standard college credit
Harvard
MIT
Stanford
Anant Agarwal
L. Rafael Reif
$100k
Undisclosed amount
Co-founder
$5.5m
$1m
$1.5m
Administrator
$724k
$895k
$200k
$15m
$16m
John works there
Designed framework
Proctors exams
Andrew Ng founded Google Brain project
$2m
Partner
Partnered on learning outcomes study
Helped develop platform
Andrew Ng and Daphne Koller used to teach there
$3.7m
Helped found
President
Sebastian Thrun is a professor
Andrew Ng is an alumnus
Salman Khan is an alumnus
Sharing Classics platform
$60m
May recommend credit for courses

MOOCs rising

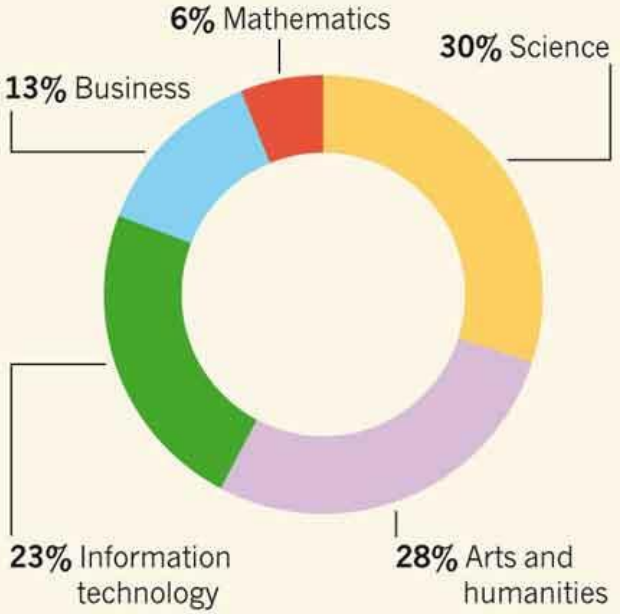
Over little more than a year, Coursera in Mountain View, California — the largest of three companies developing and hosting massive open online courses (MOOCs) — has introduced 328 different courses from 62 universities in 17 countries (left). The platform's 2.9 million registered users come from more than 220 countries (centre). And courses span subjects as diverse as pre-calculus, equine nutrition and introductory jazz improvisation (right).

Supply and demand

Student origins



Courses offered



4. MOOC在中国

1. 什么是MOOC？　2. MOOC的发展　3. MOOC的现状　案例：coursera/bayes

coursera

Courses Institutions About | Wang Zhongkai

Search by course name, category, university, or instructor

Global Partners (28) · US State Institutions (0)

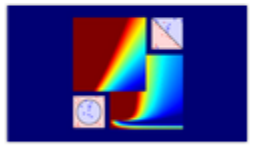
Sort by Starting soon

- Starting Soon 4

Eligible For

- Verified Certificates 5

- **All Languages** 542
- English 478
- Chinese 28
- French 18
- Spanish 14
- Russian 13
- Portuguese 6
- Turkish 4
- German 2
- Ukrainian 2
- Arabic 1
- Italian 1
- Japanese 1

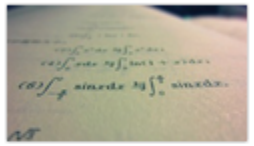


National Taiwan University
機器學習基石 (Machine Learning Foundations)
with Hsuan-Tien Lin

Nov 26th 2013
8 weeks long
Enroll

National Taiwan University
紅樓夢(The Red Chamber Dream)
with 歐麗娟 Li-chuan Ou

Nov 27th 2013
6 weeks long
Enroll



Shanghai Jiao Tong University
数学之旅 The Journey of Mathematics
with 王 维克

Dec 1st 2013
6 weeks long
Go to Class

Shanghai Jiao Tong University
中医药与中华传统文化 Traditional Chinese Medicine and Chinese Culture
with 彭 崇胜

Dec 1st 2013
7 weeks long
Enroll

National Taiwan University
基礎光學 I (Introduction to Optics I)

Dec 25th 2013
6 weeks long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TED
可汗学院
赏课
NEW
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公开课策划
coursera 官方中文学习社区
学习流程>
最新的学习模式
Coursera课程使用了最新的学习模式MOOC：作业、成绩、证书...
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全球用户精彩课评、老师或助教入驻直接参与交流，中文交流更便捷。
了解更多>
丰富的课程资源
艺术、计算机、商业...25类课程 500多门课程，我们将全部引入。
全部课程>
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遗传学与进化概论
【授课老师寄语】专为中国学生录制

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【ISON过近日点直播】冰与火今夜决战

用颜色判断鸡蛋营养？不靠谱！

成年人可以学会演奏复杂乐器吗？

"关掉"旧习惯，本性不再难移

成年人可以学会演奏复杂乐器吗？

有情感会说话，虚拟人脸Zoe诞生

机器人如何在沙地上自如行走？

谷歌知道你什么时候想做

活跃达人 申请成为达人 更多达人

AI油泳的鹰 126人关注
勘查技术与工程专业，编程爱好者

牛嘸啶 258人关注
物理专业

史莱姆无孔不入 38人关注
语文教师，万有青年烩讲者

热门问答

科学·技术

科技的进步是偶然还是发展的必然？

人文·社科

为什么土耳其和火鸡在英语里是一个词？

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搜索
热门关键词：
课程目录
出国留学
新东方在线 11月25日-12月14日
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密 码：
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忘记密码？
登 录
注 册


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智能成绩分析
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[公告]YY教育新年问卷调查获奖名...
[新闻]【财富秘笈】2个月，中汽同...
[新闻]【财富秘笈】名师开创新网校...
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什么是MOOC?
——MOOC入门第一课
coursera
专区介绍

案例：在Coursera学习Bayes

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coursera

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Eligible For

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- English 31
- Chinese 2
- French 1
- Arabic 0
- German 0
- Italian 0
- Japanese 0
- Portuguese 0
- Russian 0
- Spanish 0
- Turkish 0
- Ukrainian 0

Columbia University

Financial Engineering and Risk Management Part II

with Martin Haugh & Garud Iyengar

January 2014
7 weeks long
Enroll

National University of Singapore

Unpredictable? Randomness, Chance and Free Will

with Valerio Scarani

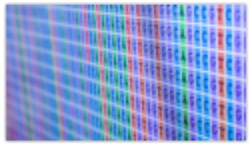
January 2014
8 weeks long
Starts in a month

Johns Hopkins University

Computing for Data Analysis

with Roger D. Peng

Jan 6th 2014
4 weeks long
Starts in a month

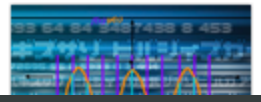


University of Toronto

Bioinformatic Methods I

with Nicholas James Provart

Jan 6th 2014
6 weeks long
Enroll



University of Washington

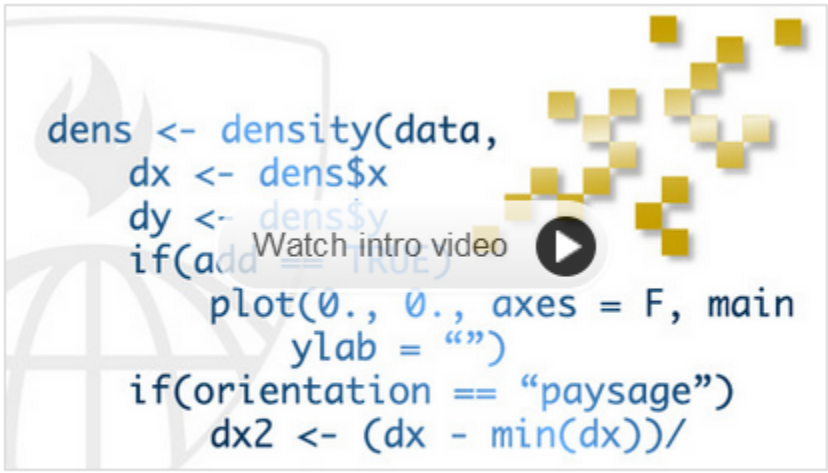
Computational Methods for Data Analysis

Jan 6th 2014
10 weeks long

JOHNS HOPKINS
BLOOMBERG SCHOOL of PUBLIC HEALTH

Computing for Data Analysis

This course is about learning the fundamental computing skills necessary for effective data analysis. You will learn to program in R and to use R for reading data, writing functions, making informative graphs, and applying modern statistical methods.



Sessions:

Jan 6th 2014 (4 weeks long) | Starts in a month

1.9k

g+1

About the Course

In this course you will learn how to program in R and how to use R for effective data analysis. You will learn how to install and configure software necessary for a statistical programming environment, discuss generic programming language concepts as they are implemented in a high-level statistical language. The course covers practical

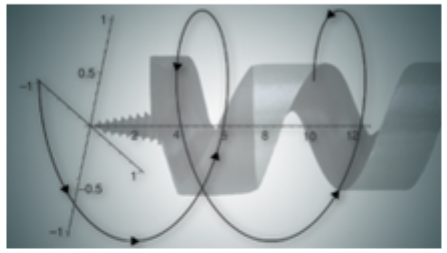
About the Instructor

Roger D. Peng
Johns Hopkins University

coursera

Courses Institutions About | Wang Zhongkai

YOUR COURSES (View all enrolled courses)



The Ohio State University
Calculus One
Aug 23rd — Nov 29th

course info | un-enroll — Go to class

Princeton University
Statistics One
Sep 22nd — Dec 15th

course info | un-enroll — Go to class

The Ohio State University
Calculus Two: Sequences and Series

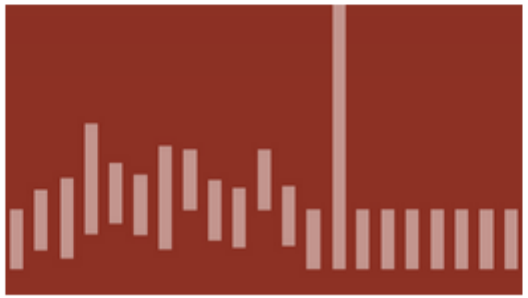
COURSERA POLL

How interested would you be in the ability to ask questions directly of a teaching assistant on Coursera?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

Submit skip

RECOMMENDED FOR YOU



Algorithms, Part II
Princeton University, Date TBA

UNIVERSITY OF MICHIGAN

Model Thinking
by Scott E. Page

Home

Syllabus

COURSE CENTRAL

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Quizzes

Exams

COMMUNITY

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Announcements

What We Learned - Week 6

I want to start this e-mail with a message to our students who stopped following along at some point during the first half of the course: now is a great time to jump back into things. We just finished the midterm, and although that piece was essential to passing the course, there's a fresh new batch of models to learn from over the next few weeks.

Following the midterm exam, it was back to the books for our section on Lyapunov Functions. Let's take a quick review of what we learned. For those of you were worn out by the midterm, here's what you missed this week:

Lyapunov Functions tell us how long it will take for a puppy to empty a bucket of biscuits, or how long a squirrel will eat up all of the nuts in the backyard. The Lyapunov Function is a catch-all for systems that go to equilibrium, and it tells us how long it will take a system to reach equilibrium. So... you go to the market hoping to buy and sell some goods. In essence, you want to make some trades, and so do all of the other people who also show up at the market. Each trade has a cost (it takes a lot of energy to make a trade!) as well as a benefit to traders in terms of happiness. You and the others trade, trade, trade... but when will the trading stop? When will everyone be as happy as possible, making any more trades nonsensical? These

Upcoming Deadlines

Quizzes

Quiz 7: Sections 13-14
Tue 3 Dec 2013 6:00 PM CST

New Lectures

15.1) Randomness and Random Walk Models (3:05)

15.2) Sources of Randomness (5:15)

15.3) Skill and Luck (8:28)

15.4) Random Walks (12:29)

15.5) Random Walks and Wall Street (7:51)

15.6) Finite Memory Random Walks (8:18)

UNIVERSITY OF MICHIGAN

Model Thinking
by Scott E. Page

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Grades are calculated as follows:

- There are 10 quizzes. We're going to drop your 2 lowest quiz scores. (Exam scores will not be dropped).
- You will have 2 attempts on each quiz and each exam. Your highest score will be the only one that counts.
- Final score equals 50% Quiz average and 50% exam average (there are 2 exams).
- Passing grade will be 75%. Any students with a grade of 75% or above will receive a certificate. If you receive above a 90%, you will receive a certificate that says that you graduated "with distinction".

Each week we release two sections. The course will last 12 weeks.

You have one week to complete each quiz and exam for full credit. For every day that your quiz submission is late, you will be penalized by 10%. After 5 late days, you will no longer be able to take quizzes or exams.

In addition, every student has 5 late days to use during the class at his or her discretion. You can use these 5 late days to submit quizzes or exams after the deadline for full credit.

Exams are not comprehensive. The midterm exam covers the first 10 sections, and the final exam covers the last 10 sections.

There are no homework assignments or peer-graded assignment for this course.

Created Tue 22 Jan 2013 4:18 AM CST
Last Modified Tue 12 Nov 2013 5:41 AM CST

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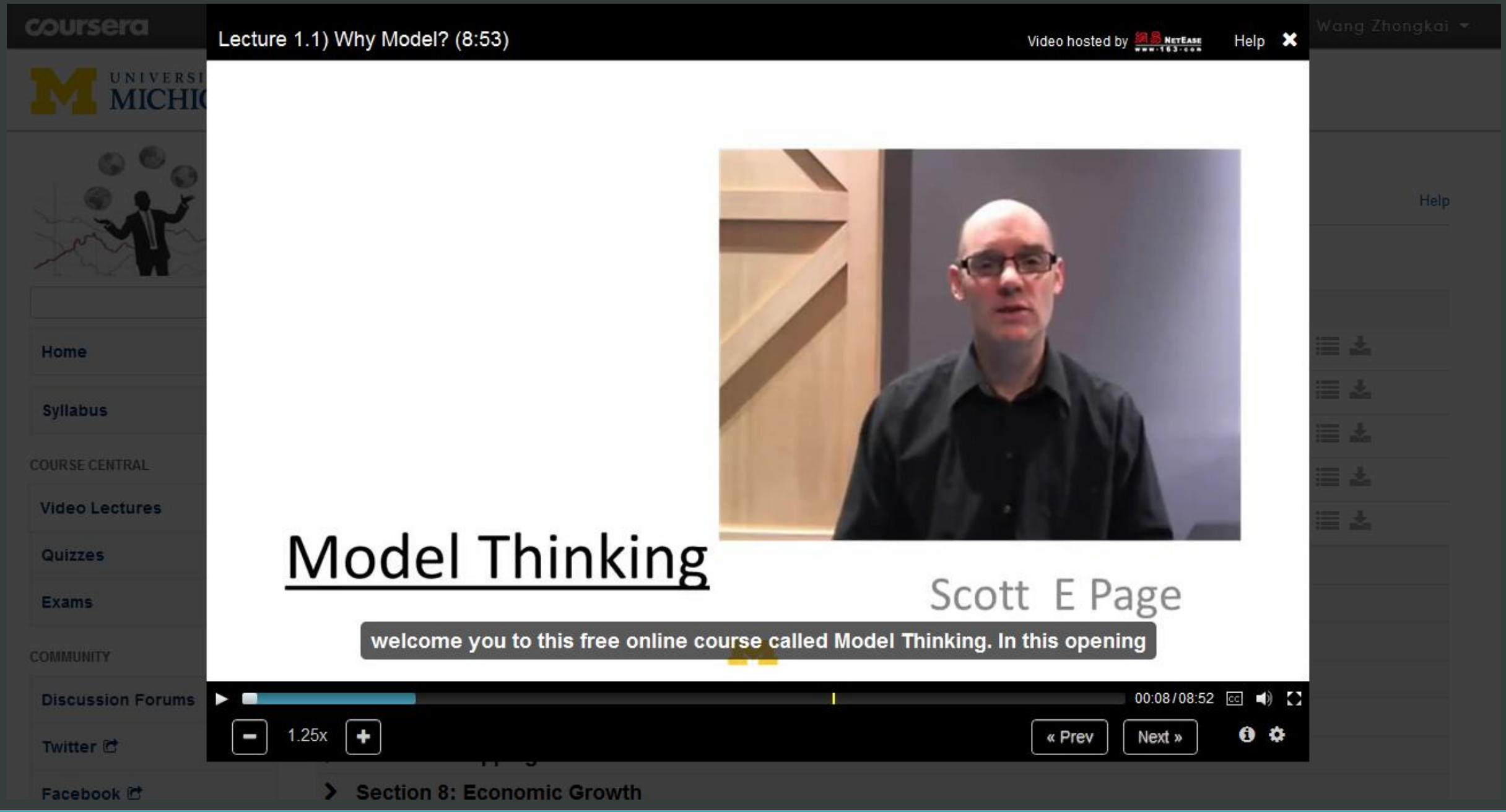
- Section 5: Thinking Electrons: Modeling People
- Section 6: Categorical and Linear Models
- Section 7: Tipping Points
- Section 8: Economic Growth
- Section 9: Diversity and Innovation
- Section 10: Markov Processes
- Section 11: Lyapunov Functions
- Section 12: Coordination and Culture
- Section 13: Path Dependence
- Section 14: Networks
  - ✔ 14.1) Networks (7:04)
  - ✔ 14.2) The Structure of Networks (19:30)
  - 14.3) The Logic of Network Formation (10:03)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Lecture 1.1) Why Model? (8:53)
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Section 12: Coordination and Culture

Quiz 6: Sections 11-12

Help

Attempt Quiz

Due Date

Tue 26 Nov 2013 6:00 PM CST Apply late days

If you submit after the due date (but before the hard deadline), your submission score will be penalized by 10% for each day after the due date.

Hard Deadline

Sun 1 Dec 2013 6:00 PM CST

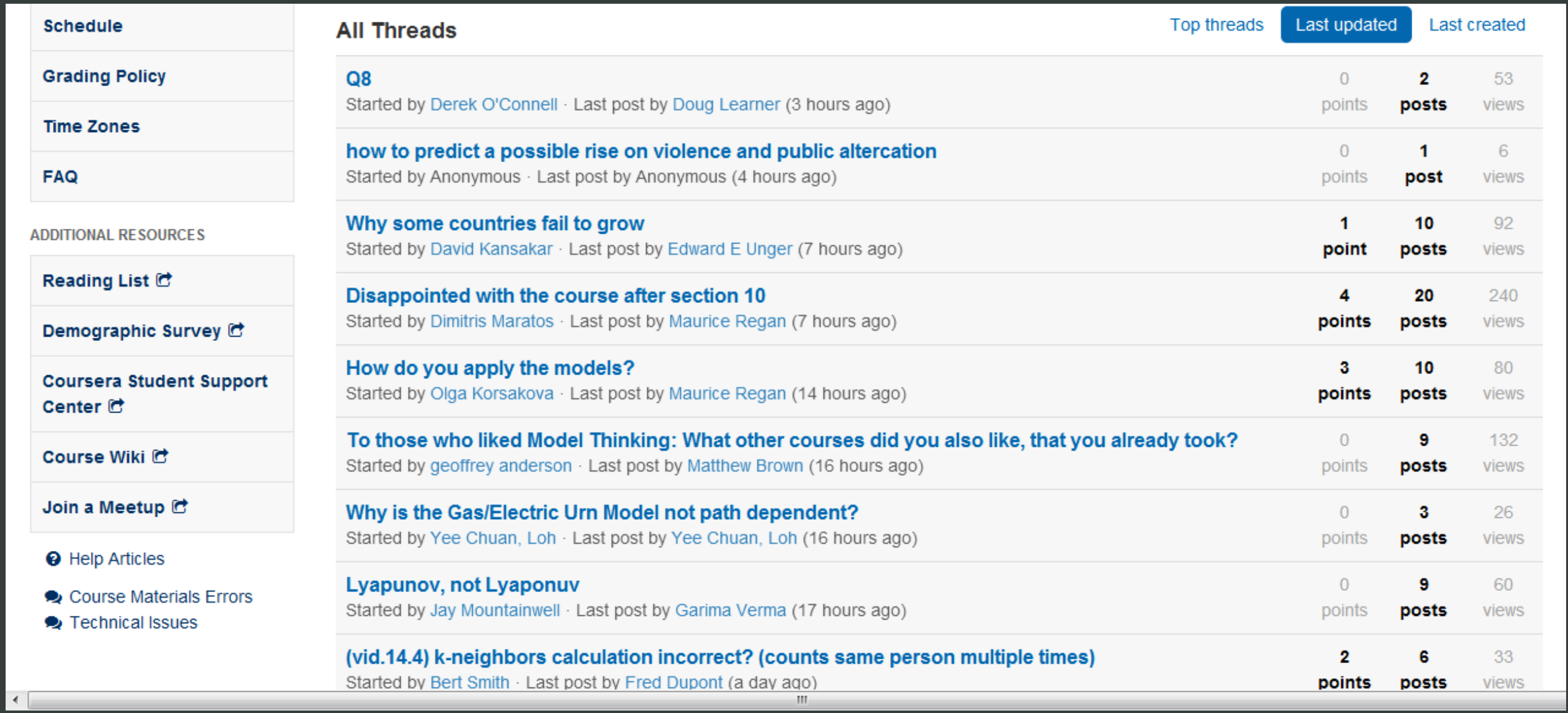
If you submit any time after the hard deadline, you will not receive credit.

Effective Score

10.00 / 10.00

*Explanation: 10.00 = 10.00 (Score for attempt 2) * 100% (No penalties)*

Each time that you attempt it, we'll record a score based on your performance and any penalties due to late submissions. Your effective score will be the highest score of all the **allowed** attempts made before the hard deadline.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6 posts
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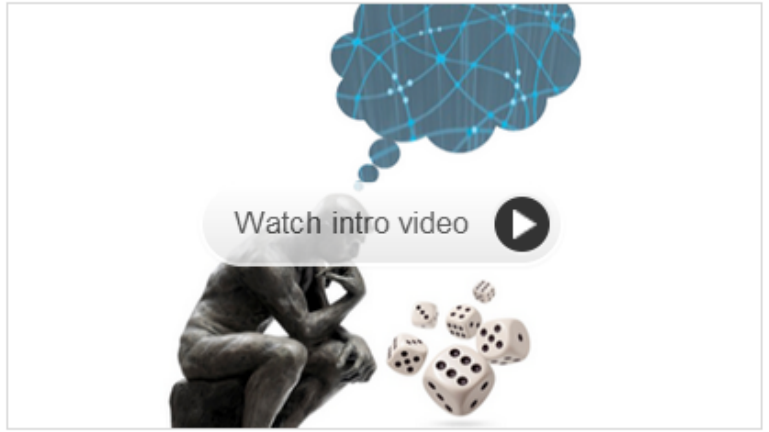
Stanford

Probabilistic Graphical Models

In this class, you will learn the basics of the PGM representation and how to construct them, using both human knowledge and machine learning techniques.



Sessions:

Apr 8th 2013 (11 weeks long) View class archive

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About the Course

What are Probabilistic Graphical Models?

Uncertainty is unavoidable in real-world applications: we can almost never predict with certainty what will happen in the future, and even in the present and the past, many important aspects of the world are not observed with certainty. Probability theory gives us the basic foundation to model our beliefs about the different possible states of the world, and to update these beliefs as new evidence is obtained. These beliefs can be combined with individual preferences to help guide our actions, and even in

About the Instructor

Daphne Koller
Stanford University

Course Details

Daphne Koller

Professor
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Professor Daphne Koller joined the faculty at Stanford University in 1995, where she is now the Rajeev Motwani Professor in the School of Engineering. Her main research interest is in developing and using machine learning and probabilistic methods to model and analyze complex domains. Her current research projects span computational biology, computational medicine, and semantic understanding of the physical world from sensor data. She is the author of over 200 refereed publications, which have appeared in venues that range from Science to numerous conferences and journals in AI and Computer Science. She has given keynote talks at over 10 different major conferences, also spanning a variety of areas. She was awarded the Arthur Samuel Thesis Award in 1994, the Sloan Foundation Faculty Fellowship in 1996, the ONR Young

Probabilistic Graphical Models
Apr 8th 2013

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Stanford **Probabilistic Graphical Models**
by Daphne Koller

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Video Lectures

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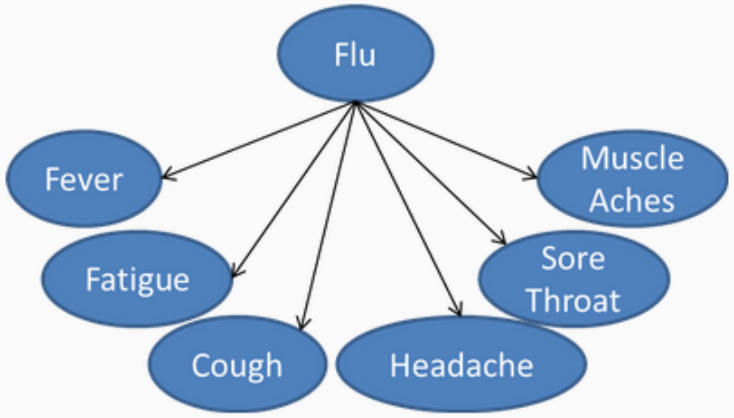
Introduction and Overview (Week 1)

Bayesian Network Fundamentals (Week 1)

- ✔ Semantics & Factorization (17:20)
- Reasoning Patterns (09:59)
- Flow of Probabilistic Influence (14:36)
- Conditional Independence (12:38)
- ✔ Independencies in Bayesian Networks (18:18)
- ✔ Naive Bayes (09:52) Quiz Attempted
- Application - Medical Diagnosis (09:19)

Question 10

***Naive Bayes.** Consider the following Naive Bayes model for flu diagnosis:



Assume a population size of 10,000. Which of the following statements are true in this model? You may select 1 or more options (or none of them, if you think none apply).

- Say we observe that 1000 people have a headache (and possibly other symptoms), out of which 500 people have the flu (and possibly other symptoms), and 500 people have a fever (and possibly other symptoms). Without more information, we cannot estimate how many people with a headache also have both the flu and a fever.
- Say we observe that 500 people have a headache (and possibly other symptoms) and 500 people have a fever (and possibly other symptoms). Without more information, we cannot estimate how many people have both a headache and fever.
- Say we observe that 1000 people have the flu, out of which 500 people have a headache (and possibly other symptoms) and 500 have a fever (and possibly other symptoms). We would expect that approximately 250 people with the flu also have both a headache and fever.
- Say we observe that 1000 people have a headache (and possibly other symptoms), out of which 500 people have the flu (and possibly other symptoms), and 500 people have a fever (and possibly other symptoms). We would expect that approximately 250 people with a headache also have both the flu and a fever.

Thanks

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