

CAT: Course Aggregation Tool

COS 333, Spring 2013

*Noah Apthorpe, Garrett Disco, Luke Paulsen,
Jocelyn Tang, Natalie Weires*

Roadmap

- The Problem
- Features
- Live Demo
- How it Works
- Limitations / The Future

The Problem

Princeton's course search tool is
unnecessarily complicated, and
makes poor use of available data.

The Problem

Course Search

Term Keyword Search

Closed & Canceled

Course title

Instructor

Distribution Area

Course Level

Catalog Number

Meeting days (by default all)
 Monday Tuesday Wednesday Thursday Friday

Start time within the hour (by default all)
 8:00 9:00 10:00 11:00 12:30 1:00 2:00 3:00 4:00 5:00 after 6:00

Subjects (by default all)

<input type="checkbox"/> AAS Ctr African American Studies	<input type="checkbox"/> HUM Humanistic Studies
<input type="checkbox"/> AFS African Studies	<input type="checkbox"/> ISC Integrated Science Curriculum
<input type="checkbox"/> AMS American Studies	<input type="checkbox"/> ITA Italian
<input type="checkbox"/> ANT Anthropology	<input type="checkbox"/> JDS Judaic Studies
<input type="checkbox"/> AOS Atmospheric & Oceanic Sci	<input type="checkbox"/> JPN Japanese

CLICK ALL THE THINGS!



The Problem

Extraneous
Information

Home
Contact us

Student Services
Faculty Services
Departmental Services

SCORE
Blackboard
Transcript Request
Course Offerings
 Keyword Search
 Closed and Canceled
New Courses
Courses in Race,
Ethnicity, and
Cross-Cultural
Encounter
Community-Based
Learning Initiative
Courses
STL, STN, QR

Course Offerings

New Search

Search Results for

Term: Fall 2013-2014 , Distribution area: Any, Subject: COS, Catalog number: Any, Level: Any, Instructor: Any, Times: Any

Fall 2013-2014 Browse all COS courses (including crosslistings)

Class Num	Course	Title	Dist Area	Sect	Days	Time	Location	Enrl	Max	Status	Books	Eval
20599	COS 109 EGR 109	Computers in Our World	QR	L01	M W	11:00 am - 12:20 pm		63	100			
20604	COS 126 EGR 126	General Computer Science	QR	L01	T Th	10:00 am - 10:50 am		100	310			
20607	COS 217	Introduction to Programming Systems	QR	L01	T Th	10:00 am - 10:50 am		219	225			
20615	COS 226	Algorithms and Data Structures	QR	L01	T Th	11:00 am - 12:20 pm		171	175			
20620	COS 318	Operating Systems		L01	T Th	1:30 pm - 2:50 pm		47	120			

Hidden
Feature



The Problem

Course Title: Advanced Programming Test									
You may view each semester's quantitative course evaluation data by selecting the year, division, department, subject, or course.									
Course evaluation data may not be redistributed, circulated, or published to anyone outside of the University.									
5 = Excellent, 4 = Very Good, 3 = Good, 2 = Fair, 1 = Poor									
Export as Excel									
Lectures									
Question	Responses	Response Rate	Excellent	Very Good	Good	Fair	Poor	N/A	Mean
I think that the overall quality of the lectures was:	85	70%	38%	28%	14%	14%	6%	0%	3.78
Papers, Reports, Problem Sets, Examinations									
I think that the overall quality of the written assignments was:	81	66%	28%	35%	19%	11%	6%	1%	3.69
Readings									
I think that the overall quality of the readings was:	81	66%	7%	6%	12%	6%	1%	67%	3.37
Overall Quality of the Course									
I think that the overall quality of the course was:	84	69%	38%	32%	19%	6%	5%	0%	3.93

In the online course evaluation the University invites students to provide advice for their peers by asking the question "What would you give to another student considering taking this course?"

Hidden Feature

This can be accessed by [clicking here](#). The University does not consider the information from course evaluation data; it does not take the information into consideration in approving courses for permanent status; and it does not take the information into consideration in making tenure or promotion decisions.

Poor Presentation of
Powerful Data

The Problem

Feedback for COS 333 in Spring 2011-2012

Course evaluation data may not be redistributed, circulated, or disclosed to anyone outside of the University.

You may view each semester's quantitative course evaluation summaries by division, department, subject, or course.

Course evaluation data may not be redistributed, circulated, or disclosed to anyone outside of the University.

5 = Excellent, 4 = Very Good, 3 = Good, 2 = Fair, 1 = Poor

Feedback for other students:

Question	Number of Responses	Strongly Recommend	Recommend	Neutral	Recommend Against	Strongly Recommend Against	N/A	Mean
Would you recommend this course to other students?	82	51%	32%	9%	7%	1%	--	4.24

Feedback:

- A great course with a final project that is as fun as you make it. Must take before graduation especially if you're planning on going into industry. Be a little careful with the first few assignments because the grading is much harsher than in 217/226 because they won't bother to figure out what the bug is; if it fails a test of theirs, it fails. Some people will complain that there is nothing in the lectures that you can't glean from Wikipedia, but having it presented to you so you know what is out there is, personally, much more valuable than a dozen hours roaming Wikipedia and not knowing major topics from minor details.
- Be prepared to put a lot of time into the assignments and the final project. The grading happens quickly so the project has to be easy to navigate and understand the functionality of (meaning good documentation is a must). Leave LOTS of time for debugging, making improvements and planning.
- Breezes through so many topics in 1 semester, only covering generalities, so that you really aren't able to learn much that's really solid. Assignments in 1st half of the semester are pretty tedious, and while I do like the project in the 2nd half (where you build a web/mobile app), it's not something I learned because of the class - it's something I ended up learning on my own
- Come in with a group to do the project or seek out high achieving students to be part of a group -- DO NOT get started late.
- Definitely a must take class, especially if you're lacking a foundation in programming techniques outside of 226 and 217.
- Definitely take it. Will give you some mind-blowing insights into the complications involved in real-world software development. Just remember everything is not a bed of roses and you *need* to know how to work WELL.
- Definitely take the course!

No Logical Next Step

The Problem

Too many options

Too many pages

No logical flow

The Problem Solution

- Google-like natural searches
- Results packed with information:
 - Current and Historical Registrar data
 - Numerical and Written reviews
- Platform for comparison:
 - Graphs and plots
 - Save courses for later

Roadmap

- The Problem
- Features
- Live Demo
- How it Works
- Limitations / The Future

Features

- ***Smart***: Omnibar searches by a variety of intuitive categories.
- ***Clean***: Past semesters hidden by default, but accessible with one click.
- ***Tailored***: Results are sortable, and are color-coded according to rating.
- ***Efficient***: Courses can be saved in cart for later review.
- ***Powerful***: Course review data displayed in informative graphs.

Features

Welcome to CAT! | About

nweires | logout

[View Previous Semesters](#)

[Search for Courses](#)



[Advanced Search](#)

Welcome to CAT!

Search for courses:

- Looking for a specific course?
"COS 333"
- Want all courses taught by a professor?
"Kernighan"
- Have a gap in your schedule you want
to fill?
"MW 10:00"
- Distribution requirements?
"HA", "EC", etc.
- Heavy courseload?
"pdf-only"
- Interested in a topic?
"Italian food"

Cart: (Click a course's cart icon to save it here)

Features: Search

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[View Previous Semesters](#)  [Advanced Search](#)

Welcome to CAT!

Search for courses:

- Looking for a specific course?
"COS 333"
- Want all courses taught by a professor?
"Kernighan"
- Have a gap in your schedule you want to fill?
"MW 10:00"
- Distribution requirements?
"HA", "EC", etc.
- Heavy courseload?
"pdf-only"
- Interested in a topic?
"Italian food"

Cart: (Click a course's cart icon to save it here)

Features: Advanced Search

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[View Previous Semesters](#)



[Advanced Search](#)

Welcome to CAT!

Search for courses:

- Looking for a specific course like "COS 333"
- Want all courses taught by "Kernighan"
- Have a gap in your schedule to fill? Like "MW 10:00"
- Distribution requirements like "HA", "EC", etc.
- Heavy course load like "pdf-only"
- Interested in a topic? Like "Italian food"

Advanced Search 

Subject:

Course Number:

Level: 100 200 300 400 500

Instructor:

Title:

Day: Mon Tue Wed Thurs Fri
 8:00 9:00 10:00 11:00 12:30
 1:00 2:00 3:00 4:00 5:00 after 6:00

Distribution: EM EC HA LA QR SA STN STL

PDF Only:

Keyword:

Cart: (Click a course's cart icon to save it here)

Features: Previous Semesters

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[View Previous Semesters](#) COS  Advanced Search

Sort Results By: [Subject & Number](#)

COS 109 / EGR 109 : Computers in Our World Brian W. Kernighan	
COS 126 / EGR 126 : General Computer Science Robert Sedgewick	
COS 217 : Introduction to Programming Systems Jaswinder Pal Singh	
COS 226 : Algorithms and Data Structures Szymon M. Rusinkiewicz	
COS 318 : Operating Systems Kai Li	

Cart: (Click a course's cart icon to save it here)

Features: Rank

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Hide Previous Semesters

COS

Advanced Search

Sort Results By: Subject & Number

Subject & Number

Average Rating

Brian W. Kernighan Professor

COS 116 / EGR 116 : The Computational Universe Adam Finkelstein

COS 126 / EGR 126 : General Computer Science Robert Sedgewick

COS 217 : Introduction to Programming Systems Jaswinder Pal Singh

COS 226 : Algorithms and Data Structures Szymon M. Rusinkiewicz

Cart: (Click a course's cart icon to save it here)

Features: Color Coding

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Hide Previous Semesters **COS 1:30 TTh** Advanced Search

Sort Results By: **Average Rating ▾**

COS 518 : Advanced Computer Systems
Michael Joseph Freedman
 

COS 521 : Advanced Algorithm Design
Sanjeev Arora
 

**COS 597C : Advanced Topics in Computer Science:
Shape Analysis**
Thomas Allen Funkhouser
 

COS 126 / EGR 126 : General Computer Science
Robert Sedgewick
 

COS 318 : Operating Systems
Kai Li


Cart: (Click a course's cart icon to save it here)

Features: Class Display

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The screenshot shows the 'Class Display' feature for the COS department. The top navigation bar includes links for 'Hide Previous Semesters', 'COS', a search icon, and 'Advanced Search'. A red circle highlights the 'See Reviews' button next to the semester selection dropdown, which is set to 'Spring 2013'. On the left, a sidebar lists course cards for COS 326, COS 333, COS 340, COS 375 / ELE 375, and COS 397. Each card displays the course name, professor(s), a green circular icon, and a shopping cart icon. The main content area shows details for COS 333: Advanced Programming Techniques, taught by Brian W. Kernighan and Christopher M. Moretti. It includes an overall rating of 4.06, a sample reading list (Kernighan & Pike, The Practice of Programming), reading/writing assignments (programming assignments and a term project), and requirements/grading (Design Project - 50%, Programming Assignments - 40%, Class/Precept Participation - 10%). At the bottom, a note says 'Cart: (Click a course's cart icon to save it here)'.

Hide Previous Semesters COS Advanced Search

Select Semester: Spring 2013 See Reviews

COS 326 : Functional Programming David P. Walker

COS 333 : Advanced Programming Techniques Brian W. Kernighan, Christopher M. Moretti

COS 340 : Reasoning about Computation Kintali Shiva Prasad

COS 375 / ELE 375 : Computer Architecture and Organization Margaret Rose Martonosi

COS 397 : Junior Independent Work (B.S.E. candidates only) Adam Finkelstein, Vivek S. Pai

Cart: (Click a course's cart icon to save it here)

Spring 2013
COS 333

| Overall: 4.06 | Lectures: 3.95 | Readings: 3.52 |

Advanced Programming Techniques
Brian W. Kernighan, Christopher M. Moretti

This is a course about the practice of programming. Programming is more than just writing code. Programmers must also assess tradeoffs, choose among design alternatives, debug and test, improve performance, and maintain software written by themselves & others. At the same time, they must be concerned with compatibility, robustness, and reliability, while meeting specifications. Students will have the opportunity to develop these skills by working on their own code and in group projects.

Sample Reading List:
Kernighan & Pike, The Practice of Programming

Reading/Writing assignments:
There will be a number of programming assignments and a term project. The project will be done in groups and will involve creation of a major piece of software, the purpose of which each group will choose.

Requirements/Grading:
Design Project - 50%
Programming Assignments - 40%
Class/Precept Participation - 10%

Features: Reviews

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View Previous Semesters **COS** Advanced Search

Sort Results By: Subject & Number

COS 109 / EGR 109 : Computers in Our World
Brian W. Kernighan

COS 126 / EGR 126 : General Computer Science
Robert Sedgewick

COS 217 : Introduction to Programming Systems
Jaswinder Pal Singh

COS 226 : Algorithms and Data Structures
Szymon M. Rusinkiewicz

COS 318 : Operating Systems
Kai Li

Select Semester: Fall 2013 See Course Data

Semester	Readings	Assignments	Precepts	Lectures	Overall
Fall 2010 (Dondero Jr.)	3.4	4.1	4.7	3.9	4.1
Spring 2011 (Moretti)	3.4	4.2	4.8	4.2	4.2
Fall 2011 (Dondero Jr.)	3.3	4.0	4.5	3.7	4.0
Spring 2012 (Dondero Jr.)	3.7	4.2	4.2	4.1	4.1
Fall 2012 (Dondero Jr.)	3.3	3.9	3.9	3.9	3.9

Fall 2013
Jaswinder Pal Singh
No data available for this semester.

Spring 2013
Robert M. Dondero Jr., Larry L. Peterson
No data available for this semester.

Cart: (Click a course's cart icon to save it here)

Features: Cart

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[View Previous Semesters](#) COS  [Advanced Search](#)

Sort Results By: [Subject & Number](#)

Select Semester: [Fall 2013](#)

[See Reviews](#)

COS 109 / EGR 109 : Computers in Our World
Brian W. Kernighan
 

COS 126 / EGR 126 : General Computer Science
Robert Sedgewick
 

COS 217 : Introduction to Programming Systems
Jaswinder Pal Singh
 

COS 226 : Algorithms and Data Structures
Szymon M. Rusinkiewicz
 

COS 318 : Operating Systems
Kai Li
 

Fall 2013
COS 326

| Overall: 4.17 | Lectures: 4.15 | Precepts: 3.27 | Readings: 4.00 |

Functional Programming
David P. Walker

An introduction to the principles of typed functional programming. Programming recursive functions over structured data types and informal reasoning by induction about the correctness of those functions. Functional algorithms and data structures. Principles of modular programming, type abstraction, representation invariants and representation independence. Parallel functional programming, algorithms and applications.

Sample Reading List:
Guy Cousineau, Michel Mavny, The Functional Approach To Programming

Reading/Writing assignments:
Weekly or bi-weekly assignments and end-of-term assignment (final) to be due prior to dean's date.

Requirements/Grading:
Mid Term Exam - 25%
Programming Assignments - 55%
Quizzes - 20%

Prerequisites and Restrictions:
COS 226 or with permission of the instructor..

Cart: [COS126](#)  [COS217](#)  [COS326](#) 

Roadmap

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- Features
- **Live Demo**
- How it Works
- Limitations / The Future



Roadmap

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How it works: the data

- Sources:
 - OIT webfeed (course and professor info, in XML)
 - Registrar site (grading, distribution area)
 - Course review site
- Techniques:
 - BeautifulSoup (Thanks to Alex Ogier '12!)
 - Automated script to scrape course review data
(Thanks to Candy Button '13!)

How it works: the stack



`$(jQuery)`

`<html>`

`{css;}`



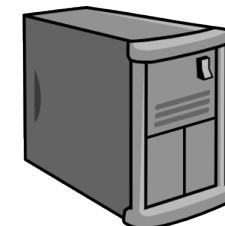
django

 mongoDB

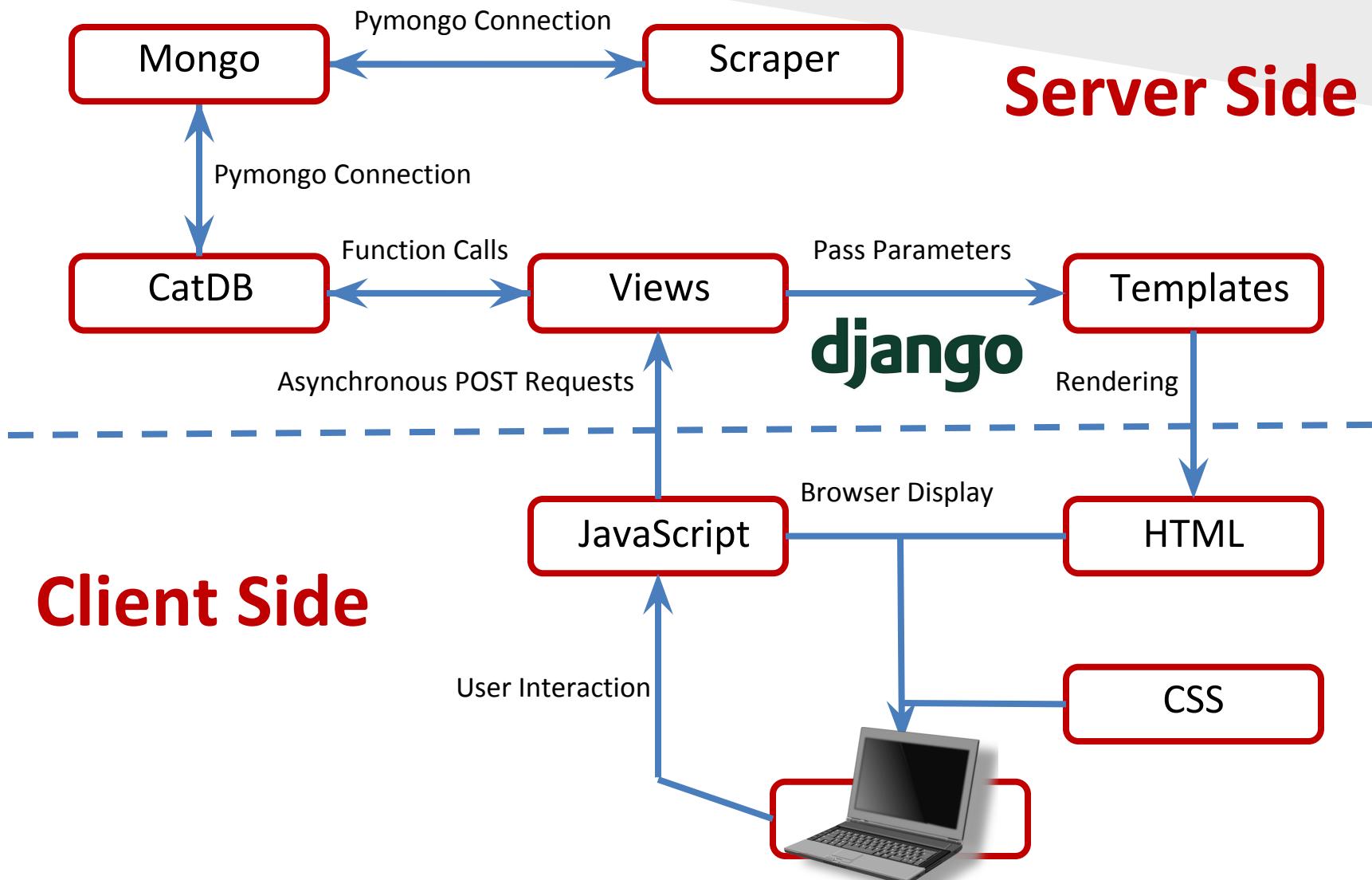
APACHE
HTTP SERVER



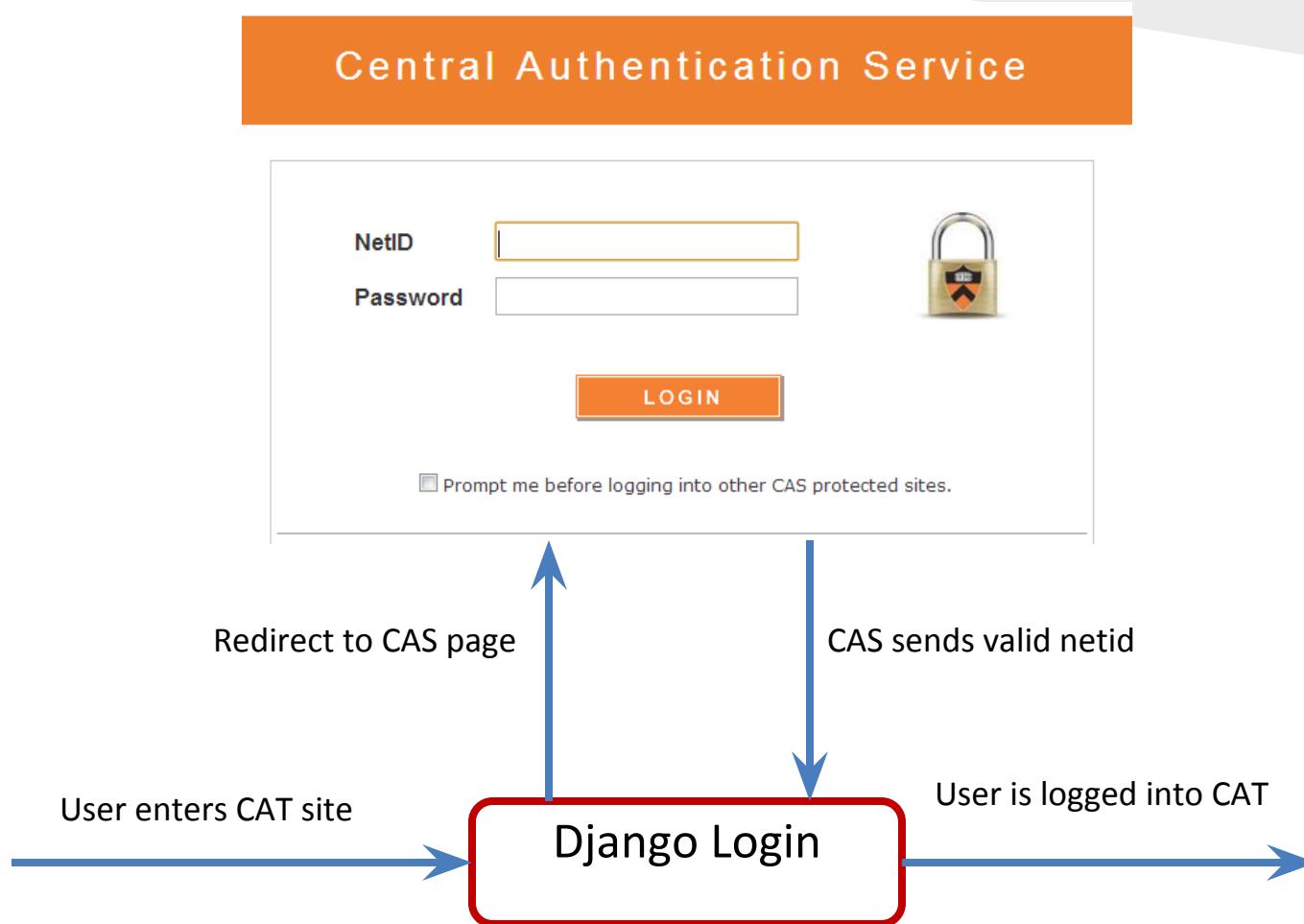
 **amazon**
web services™



How it works: the flow



How it works: security



Roadmap

- The Problem
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Limitations

Smarter Searching

- Keyword searches sometimes give unexpected results
- Ex. "Christian Ethics"

Departmental re-numberings

- Ex. Math Department
- Need a mapping from old to new course numbers
 - automated?
 - manual?

The Future

- Professor info
- Official Tigerapps support
- Integration with ICE
- Textual Analysis of Cart Data

Thank you!

Questions?