skedge 🐭
alternative course scheduling

Dan Hassan

CSC 200H
19 March 2016
### Arts, Sciences, and Engineering

**Course Title:** TECHNICAL COMPUTING

<table>
<thead>
<tr>
<th>CRN</th>
<th>Course</th>
<th>Course Title</th>
<th>Term</th>
<th>Credits</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>49682</td>
<td>CSC 108</td>
<td>TECHNICAL COMPUTING</td>
<td>Fall 2016</td>
<td>4.0</td>
<td>Open</td>
</tr>
</tbody>
</table>

**Schedule:**
- **Day:** TR  
- **Begin:** 1650  
- **End:** 1805  
- **Building:** GREEN  
- **Room:** 109

**Enrollment:**
- **Section Enroll:** 0  
- **Section Cap:** 50

**Class Info:** YOU MUST REGISTER FOR A LAB WHEN REGISTERING FOR THE MAIN SECTION.

**Instructors:** RAUQUEN R

**Prerequisites:** None

**Description:** An introduction to computer applications in business and graphic design. Students will begin by learning the basics and some advanced functions of Microsoft Word, Excel, and PowerPoint. The class then progresses through the Adobe graphic design applications Photoshop, After Effects, and Flash. In learning these applications, students are introduced to tools such as computer graphics, file compression, and animation. Not open to officially declared CSC majors.

**Clusters:** N4CSC002, N4CSC013, N4CSC015

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### Computer Science

**Course Title:** TECHNICAL COMPUTING - LAB

<table>
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<tr>
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<tr>
<td>49698</td>
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<td>TECHNICAL COMPUTING - LAB</td>
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**Schedule:**
- **Day:** MW  
- **Begin:** 1525  
- **End:** 1640  
- **Building:** HARK  
- **Room:** 114

**Enrollment:**
- **Section Enroll:** 0  
- **Section Cap:** 29

**Instructors:** RAUQUEN R

**Description:** An introduction to computer applications in business and graphic design. Students will begin by learning the basics and some advanced functions of Microsoft Word, Excel, and PowerPoint. The class then progresses through the Adobe graphic design applications Photoshop, After Effects, and Flash. In learning these applications, students are introduced to tools such as computer graphics, file compression, and animation. Not open to officially declared CSC majors.

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**Schedule:**
- **Day:** TR  
- **Begin:** 1815  
- **End:** 1930  
- **Building:** HARK  
- **Room:** 114

**Enrollment:**
- **Section Enroll:** 0  
- **Section Cap:** 29

**Instructors:** RAUQUEN R
Talk Roadmap

1) Motivations & Solutions
   • Modernity
   • Usability
   • Search
   • Social

2) Data Analytics
   • Usage
   • Trends
Motivations & Solutions

CSC 161: Intro to Programming

Comments: YOU MUST REGISTER FOR A LAB & WORKSHOP WHEN REGISTERING FOR THE MAIN SECTION.

Organized thinking, creative problem solving, and the precise description of solutions are valuable skills in academia and life. The formulation and solution of problems using computers is increasingly important in all artistic and scholarly fields. We introduce core concepts and techniques of programming as a way to develop these skills, as basis for further CS study, and for application to other fields. Lab required.

Time & Place: Tues/Thurs 6:15pm-7:30pm, B&L 109
Instructor: Sarkis R, St Jacques R
CRN: 49723

Add Section

skedge

CSC / CSC 171 / Science of Programming

some ways you can search with skedge:

csc 172
bio spring
his w
ant 2
programming

skedge social

Schedules & Likes
Share requests
Non-sharing friends
Privacy Settings

Compare schedules

Fall 2016

Compare schedules

Fall 2016
Motivations: Modernity

- GET requests vs. AJAX
  - Can use the back button!
  - Can send a link to a course/search
- Built-in scheduler vs. browser extension
  - Better UX
  - Data is centralized
- Mobile
- Public API
Motivations: Usability

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Add Section Time & Place: Tues/Thurs 6:15pm-7:30pm, B&L 109
Instructor: Sarkis R, St Jacques R CRN: 49723
0/115 enrolled

Add Section Time & Place: Mon/Wed 4:50pm-6:05pm, GRGEN 101
Instructor: St Jacques R, Sarkis R CRN: 78686
0/115 enrolled

Show 6 lab sections
Show 20 workshop sections
Motivations: Usability

- Data quality
- Courses don’t shout at you
- Grouped course sections
- Embedded labs (A/B too), workshops, & recitations
- Clickable/hoverable course links
- Multiple schedule support
- Export to Google Calendar, .ics, images
Motivations: Usability

Most important usability concern:

finding courses!

Requirements

- Finding crosslists
- Clusters

Browsing

- “New” courses
- “Autofit”
- Random
- Sorts

Friends

- What are my friends taking?
- What do they recommend?
Motivations: Search

- Year/Term: (Required)
  - SELECT A TERM
- School:
- Subject:
- Course: (MTH 162 or MTH or 162)
- Course Type:
- Status:
- Description - Keywords:
- Title:
- Instructor Name:
- Day: 
  - M 
  - T 
  - W 
  - R 
  - F 
  - S 
  - U
- Start Time Between: 
- Credit Hours Between: 
- Division:
- Upper Level Writing Courses
- Diversity Courses

[Search] [Clear]
Motivations: Search

Some ways you can search with skedge:

- csc 172
- bio spring
- his w
- ant 2
- programming
- csc taught by guo
- mur 1-2 credits
- "buddhism"
- small lin fall
- early/late eco fall
- rel x aas
- new psy
- random fms
- 70975
- cdc2s / registrar
Motivations: Search

unified search

skedge DSL

• “description”
• taught by...
• mtwrfssu
• early/late
• 1-2 credits
Motivations: Search

• 15 fields reduced to 1

• Natural language vs. form-entry
  • Pros: Faster, more intuitive, more easily extendable
  • Cons: Having to know the DSL, ambiguities

• Multipurpose
  • Used by other links (instructors, course references) around the site

• Search by CRN, crosslisted, class size were lacking
Motivations: Social
Motivations: Social

- Static image vs. live site
- Edits don’t update
- Referencing courses

Finding common courses
  a) requires your friends to share their schedules on FB publicly and you to see their post
  b) is schedule-first, not search-first
  c) typically only occurs for the current semester
**Motivations: Social**

- See friends’ schedules
- Courses likes
- Likes & enrollments show up in results
- Schedules sync across devices
- Privacy
Intermission!

Super brief technical overview
Technologies: Stack Architecture

- Web stack
  - nginx
  - unicorn
  - ruby on rails
  - postgresql
  - react.js
  - ahoy, google analytics

- Open source! [github.com/RocHack/skedge](http://github.com/RocHack/skedge) :)}
Data Analytics

Usage & Trends
Usage

• Since **November 3rd 2015** (137 days)
  • 3,768 unique users
  • 4,500 schedules
  • Average 90 sessions/day
  • Average 4.92 pages/session
  • Average 5:31 minutes/session
  • 28% of sessions are from new users
Usage: Searches

2500

2083.333

1666.667

1250

833.333

416.667

0

Usage: Searches

Based on 53,000 searches
Usage: Searches

Based on 3,500 searches
Usage: Searches

90.4% Non-empty searches
9.6% Empty searches

Based on 32,000 searches
Usage: Course Blocks

- 37% of sessions have at least one block-click
- Average of 4.76 block-clicks per session

Based on 9,500 sessions of users with schedules
Usage: Social

- **75** users have linked Skedge to Facebook
- Since March 1st,
  - 4,000+ visits (200 visits/day)
  - ~60% of visits to /social were returning visitors
  - 90 overlays onto friends’ schedules
  - 10 clicks to Facebook profiles :(

Based on 400 sessions on /social
Trends

Hypothesis #1

❖ Skedge’s navigations-per-add and other metrics demonstrate effectiveness of the use cases
   a) direct searching, and
   b) course browsing

Hypothesis #2

❖ Skedge’s DSL is user-friendly; users learn more advanced search types over time
**Trends:** Navigations-per-add

- A **navigation** is defined as
  - a search, or
  - a click on an instructor’s name, or
  - a click on a crosslisted or prerequisite course link

- The **navigations-per-add** measure is
  - the number of navigations a user took (within one session) until a course was added
Trends: Navigations-per-add

Based on 1,500 users
Trends: Navigations-per-add

Based on 1,500 users
**Trends:** Navigations-per-add

Course added...
- within 0-3 navs (median 1)
- within 4-15 navs (median 7)
- within 16-30 navs (median 21)
- above 30 navs (median 39)

Based on 1,500 users
Trends: Navigations-per-add

- **Browsing** vs. **directly searching** use case

- Next steps:
  - Test if Skedge is an effective ‘browsing’ platform
    - Infer browsing from behavior patterns
      - Search queries, adding conflict courses, bookmarks
    - See which browsing methods are most common/effective
  - Compare browsing & direct searching
    - See % of classes added by browse or direct
    - See what departments those classes are in
    - See % of browse/direct for users
**Trends:** Search types / \(dt\)

- Points for search by (omits **number** and **dept.**):
  - description
  - credits
  - crosslisted
  - CRN
  - instructor
  - title
  - year
  - term
  - ‘random’
  - upper-level writing

- “CSC” → 0
- “MTH 165” → 0
- “taught by hema” → 1 ✓ (2 searches)
- “random mur 1-2 credits” → 2 ✓ (1 search)
**Trends:** Search types / $dt$

Based on 1,500 users

Number of searches made before the first increase in search types.

- **First increase**
- **Second increase**
Trends: Search types / \( dt \)

- **First increase** *(45.3% of users)*
  - Median: 4 searches
  - Average: 6.54 searches

- **Second increase** *(8.2% of users)*
  - Median: 8 searches
  - Average: 18.69 searches
// TODO

- Features
  - “Autofit”
  - “Cluster-completer” feature

- Hypotheses
  - Measure of “course browsing” effectiveness
  - Feedback/demographic user survey

- Hear from all of you!
Thanks for listening!

Email me at dhassin@u.rochester.edu with any questions or ideas!