



**Purdue Chapter
Association for Computing Machinery**

President: Nikolas Ogg

What is ACM?

A collection of groups focused on fields in computing

- Game Development
- Artificial Intelligence
- Robotics
- Etc...

Host Special Events

- Company Tech Talks
- Help Sessions
- Student led Talks
- Programming Competitions
- Hackathons

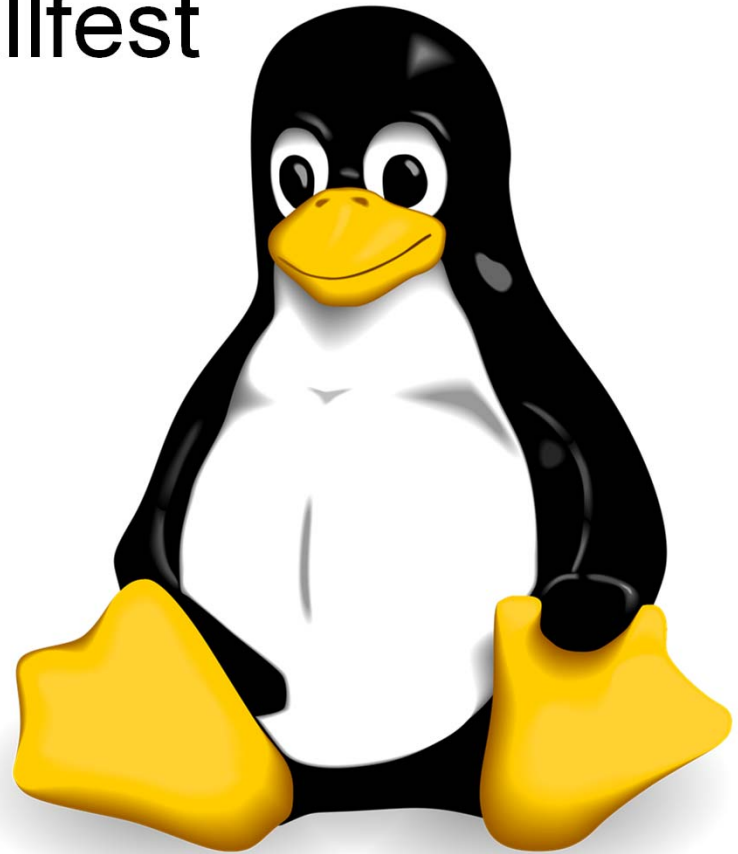


Linux Installfest

Partnered with Purdue Linux Users Group
(PLUG)

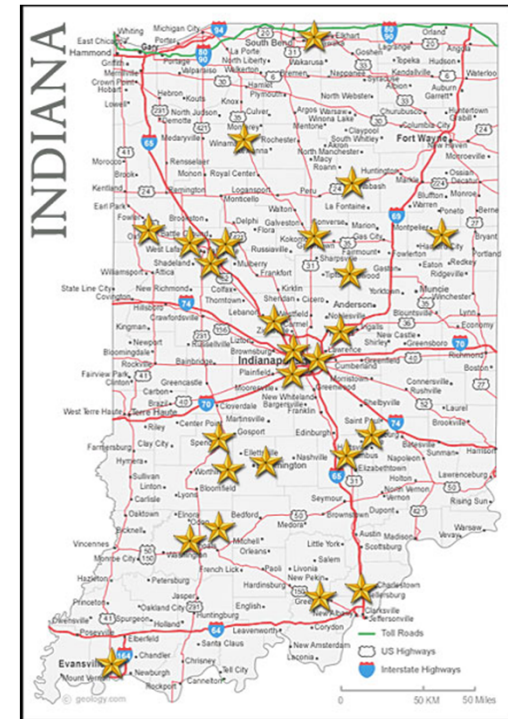
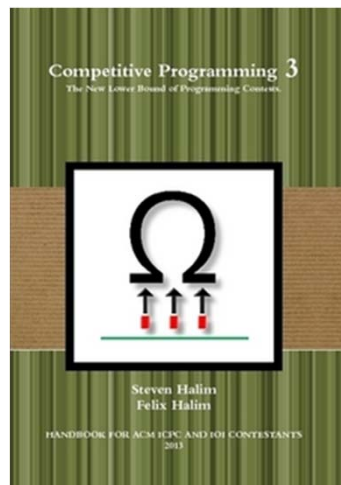
Helped students install Linux on their personal
computers

Sponsored by EMC Isilon



High School Coding Competition

Simple coding questions (think FizzBuzz)
Talk to students about CS and Purdue
Learn about competitive programming



SIGAI

Artificial Intelligence

Last Year (Fall): WikiCrawler

Wikipedia

From Wikipedia, the free encyclopedia

*This article is about the Internet encyclopedia. For other uses, see [Wikipedia \(disambiguation\)](#).
For Wikipedia's non-encyclopedic visitor introduction, see [Wikipedia:About](#).*

Wikipedia (ⁱ/wɪkiˈpidiə/ or ⁱ/wɪkiˈpidiə/ *WIK-i-PEE-dee-ə*) is a **free-access**, **free-content** Internet encyclopedia, supported and hosted by the non-profit [Wikimedia Foundation](#). Those who can access the site can edit most of its content, with the expectation that they follow the website's policies.^[6] Wikipedia is ranked among the ten most popular websites^[5] and constitutes the Internet's largest and most popular general **reference work**.^{[7][8][9]}

[Jimmy Wales](#) and [Larry Sanger](#) launched Wikipedia on January 15, 2001. Sanger^[10] coined its name,^[11] a portmanteau of *wiki*^[notes 3] and *encyclopedia*. Initially only in English, Wikipedia quickly became multilingual as it developed similar versions in [other languages](#), which differ in content and in editing practices. The [English Wikipedia](#) is now one of more than 200 Wikipedias and is the largest with over 4.9 million articles. There is a grand total, including all Wikipedias, of nearly 35 million articles in 288 different languages.^[13] As of February 2014, it had 18 billion page views and nearly 500 million [unique visitors](#) each month.^[14] Globally, Wikipedia had more than 25 million accounts,^[15] out of which there were about 120,000 active editors as of September 2015.^[2]

Supporters of Wikipedia cite a 2005 survey of Wikipedia published in *Nature* based on a comparison of 42 science

Wikipedia



WIKIPEDIA

The logo of Wikipedia, a globe featuring glyphs from several [writing systems](#), most of them meaning the letter **W** or sounds "wi", "wo" or "wa"

Screenshot [\[show\]](#)

Web address	wikipedia.org ↗
Slogan	The free encyclopedia that anyone can edit
Commercial?	No
Type of site	Internet encyclopedia
Registration	Optional ^[notes 1]
Available in	287 editions ^[1]
Users	120,000 active editors (September 2015), ^{[2][notes 2]} 26,130,709 total accounts.

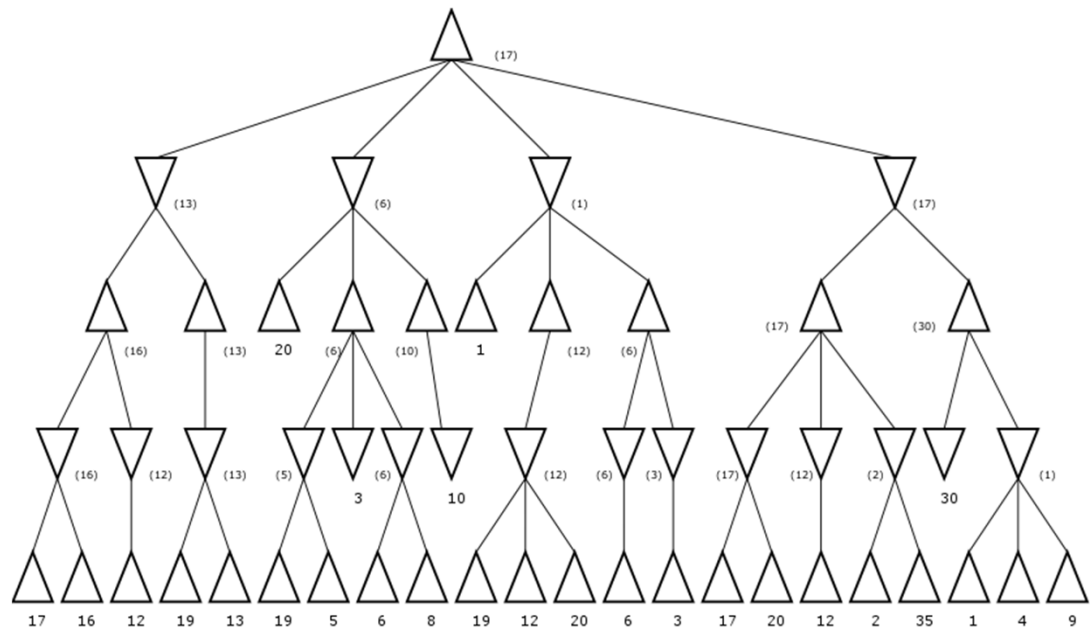
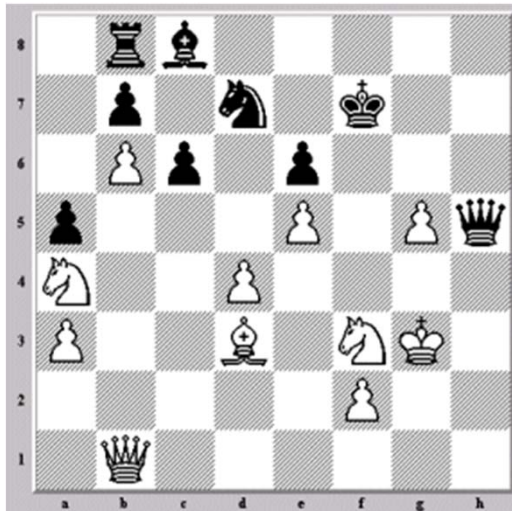
Last Year (Spring): Chess A.I.

MiniMax

Alpha Beta Pruning

Transposition Tables

Hackathon Competition



This Year (Fall): Snake A.I.

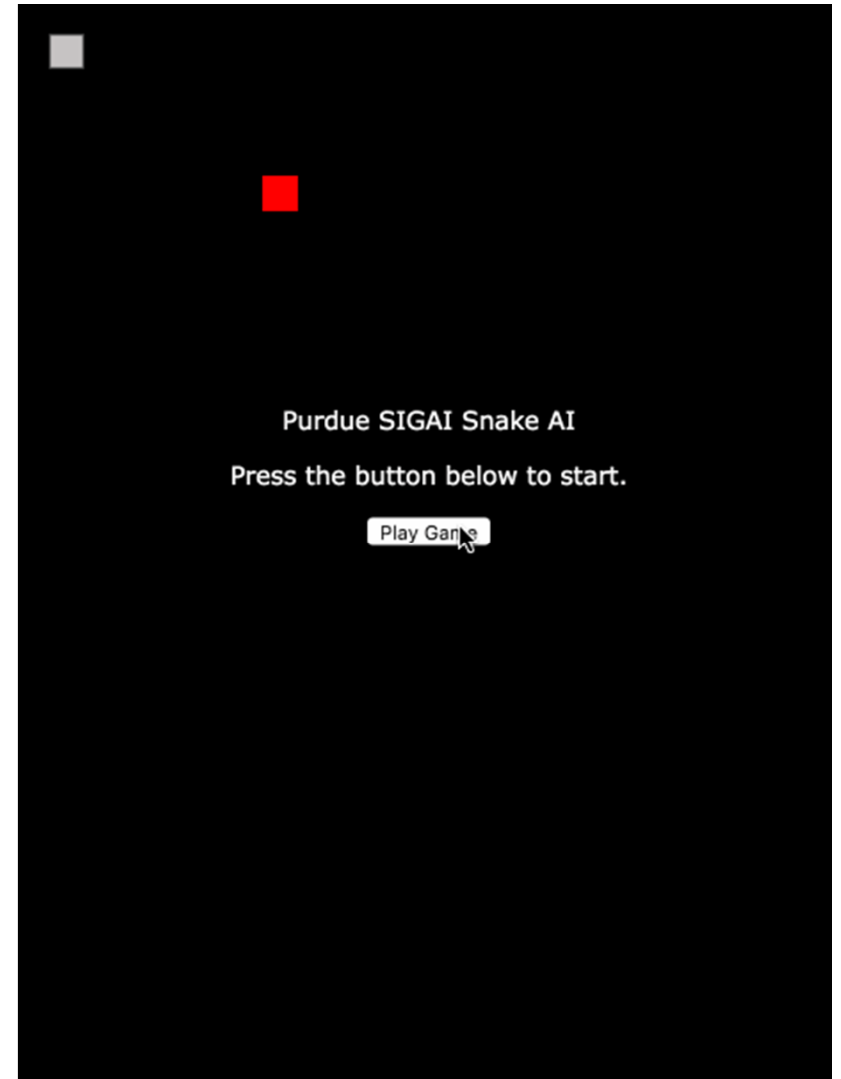
Heuristic graph searching

Grid Clutter

L-shape vs direct path

Head → Tail vs Head → Food

Prioritize living

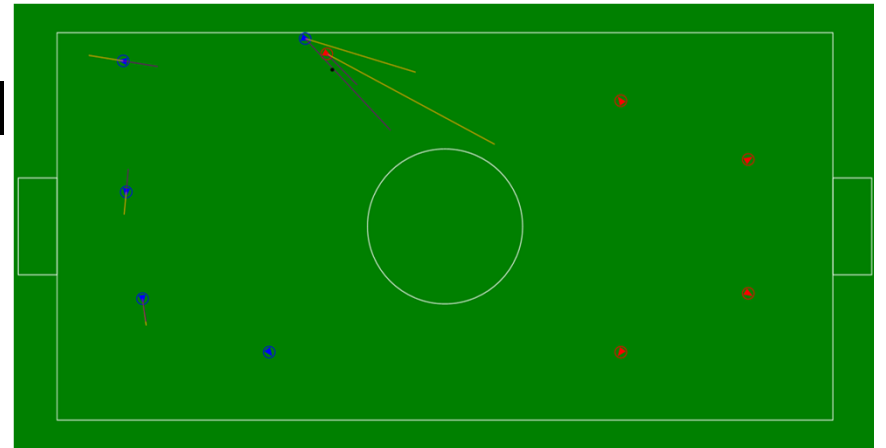


This Year (Spring): Soccer AI

We have been using C# to write a basic Soccer Engine.

Implemented basic player strategies:
stay still, seek, pursue.

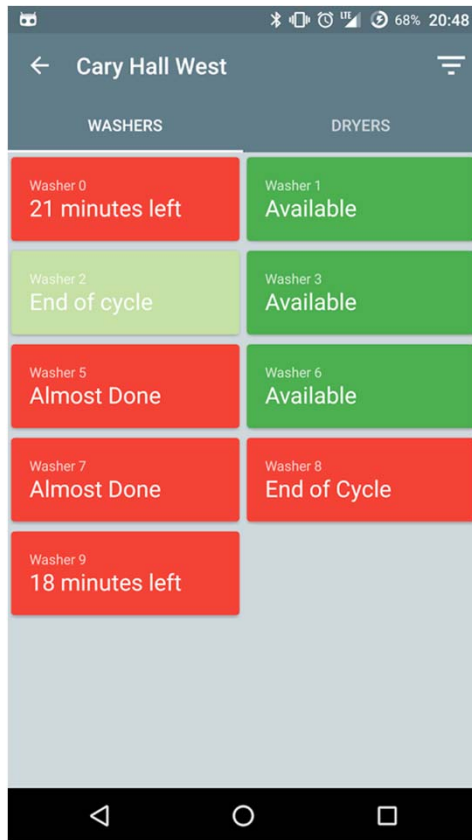
Using these player strategies to implement team strategies:
passing, spreading out, marking players, and ultimately scoring a goal.



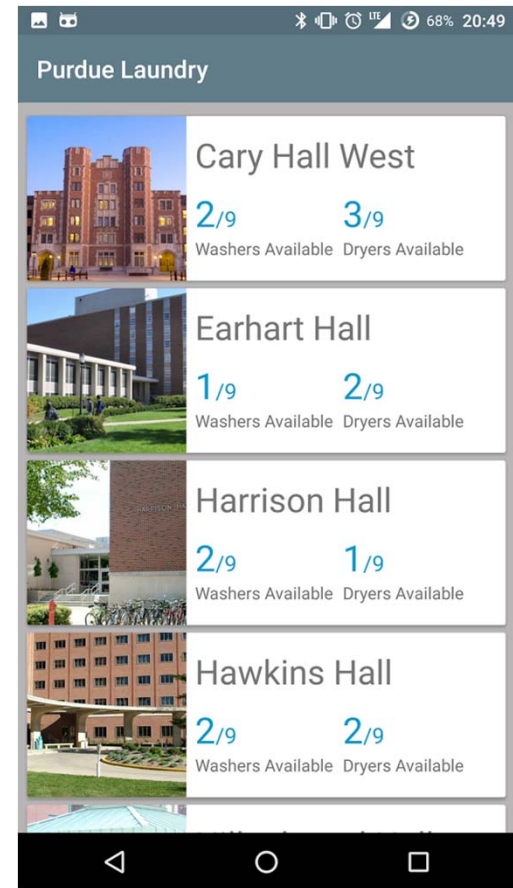
SIGAPP

Applied Computing

Last Year (Fall)



Purdue Laundry Android App



This Year (Spring)

Fixing problems in the Laundry App

- Server was hosted on Heroku (slow to startup)
- Information about machines was not cached (slow responses)
- No log management or server monitoring set up (how do we know the server is failing?)
- No analytics on how users actually use the app
- All machines at a location are sometimes offline, the UI should reflect that

Beefing up the Sever

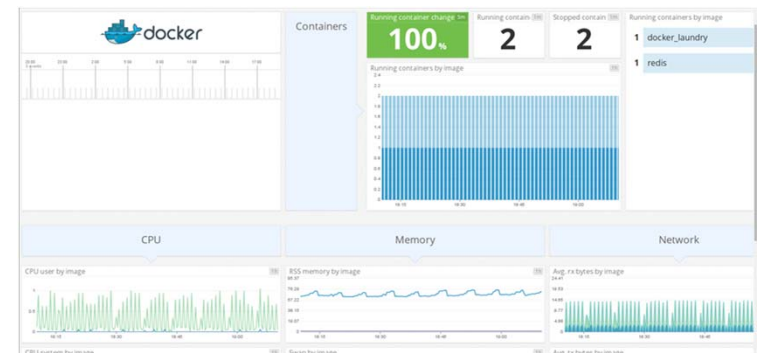
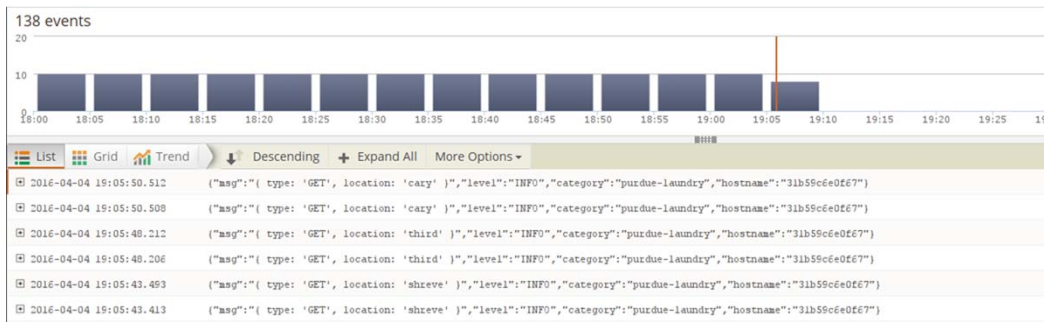


docker



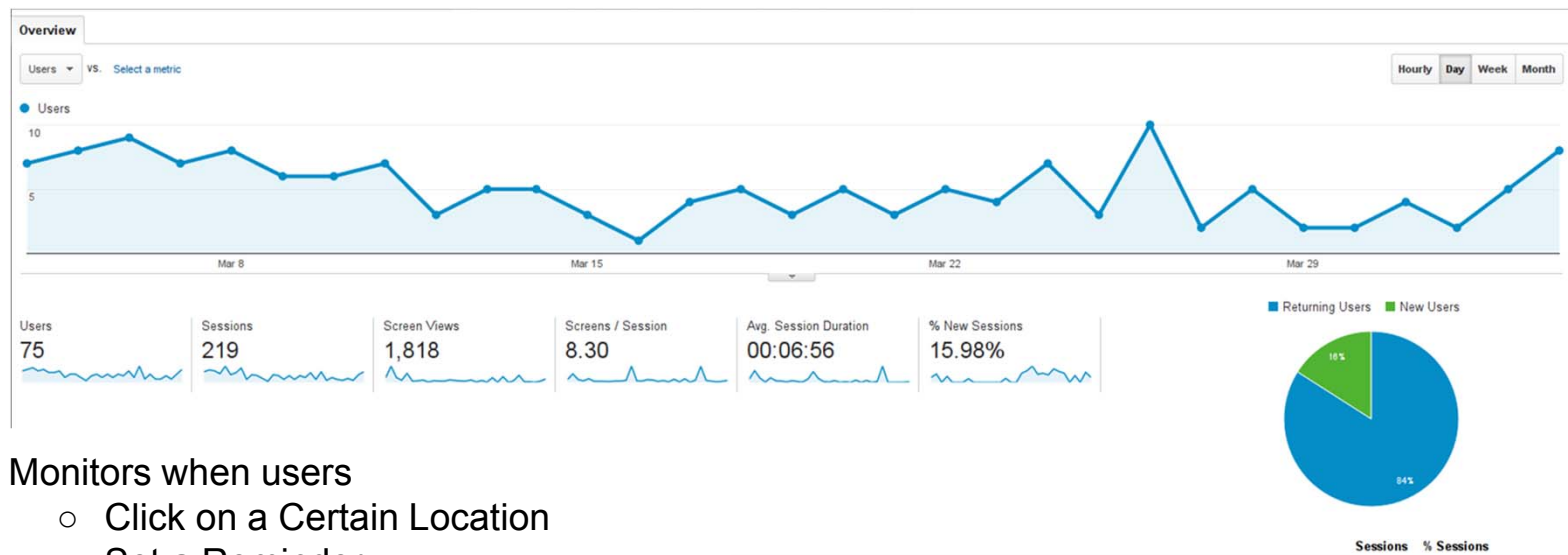
- Move Server to AWS (No more slow startup times)
- Use Redis to cache the response from the API with a TTL of 60 seconds
- Refresh the cache every 60 seconds (fast responses!)
- Move the redis server and the API server to docker containers to make it easier to deploy

Monitoring the Server



- All Server Logs get sent to a service called Loggly
- Loggly will send out emails when certain errors occur
- The servers are monitored by a service called DataDog
- We can see how much Memory is allocated, the TX/RX of the server, and even Redis stats!

Tracking Analytics

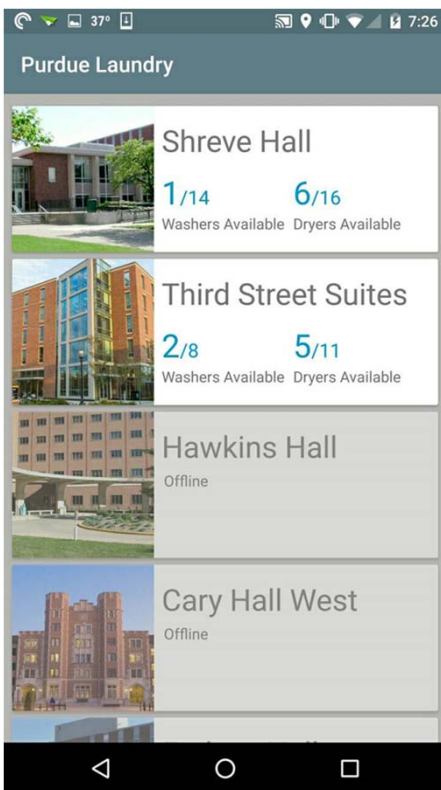


- Monitors when users
 - Click on a Certain Location
 - Set a Reminder
 - How long they spend on each screen
- Monitor status of Machines
 - What percentages of machines are offline?

Event Label	Total Events	Unique Events	Event Value	Avg. Value
1. Available	196 % of Total: 3.02% (0.42)	8 % of Total: 40.00% (20)	725 % of Total: 2.90% (0.40)	3.70 Avg for View: 3.81 (4.77%)
2. End of cycle	57 (0.88%)	8 (27.69%)	357 (65.24%)	6.26
3. In use	57 (0.88%)	8 (27.69%)	171 (23.95%)	3.00
4. Out of order	55 (0.86%)	8 (27.69%)	159 (21.93%)	2.89
5. Almost done	14 (0.14%)	2 (6.90%)	20 (2.78%)	1.43
	13 (0.43%)	3 (10.34%)	18 (2.48%)	1.38

Show rows 10 | Get 1 | 1 - 5 of 5

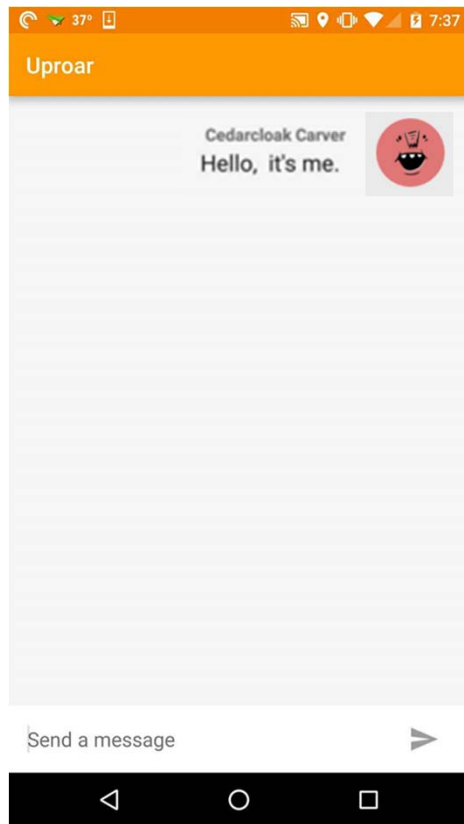
The updated App



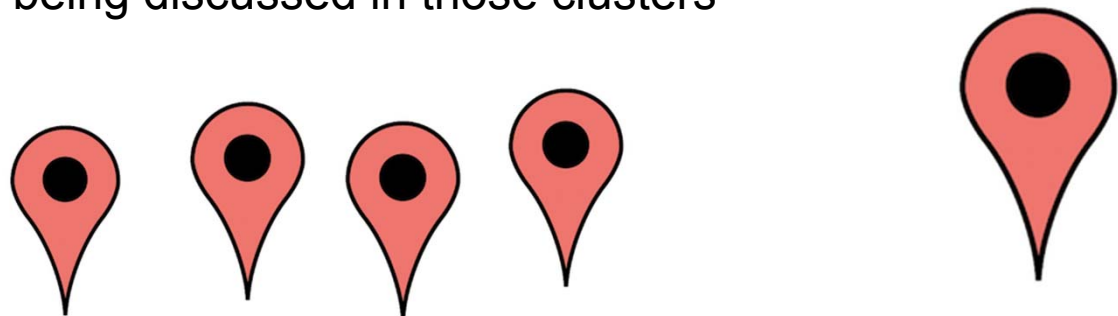
- Minor visual updates
- Better progress dialogs for the user
- Informing the user when machines are brought offline.
 - Locations now appear “grayed out” when all the machines in that location are offline
- On our end, we are tracking how many machines are in use across campus at all times.



Uproar: Explore your community



- A chat application similar to YikYak
- Rather than a conversation based chat, Uproar's messages are tied to **GPS coordinates** rather than chat rooms.
 - When a new message is sent, all users within a small radius of the message receive the message
- Users can see clusters of messages and topics being discussed in those clusters



The Uproar Backend

- We wanted to teach members the power of backends
 - Main server, in Scala, existed as a reference server for students to test their own servers functionality
 - Other members wrote a server in Node.js to try and copy the functionality
- The message pushing was implemented using PubNub
 - A pub-sub service provider
- Use RethinkDB
 - Great support for geospatial queries!



Uproar - Clustering Topics

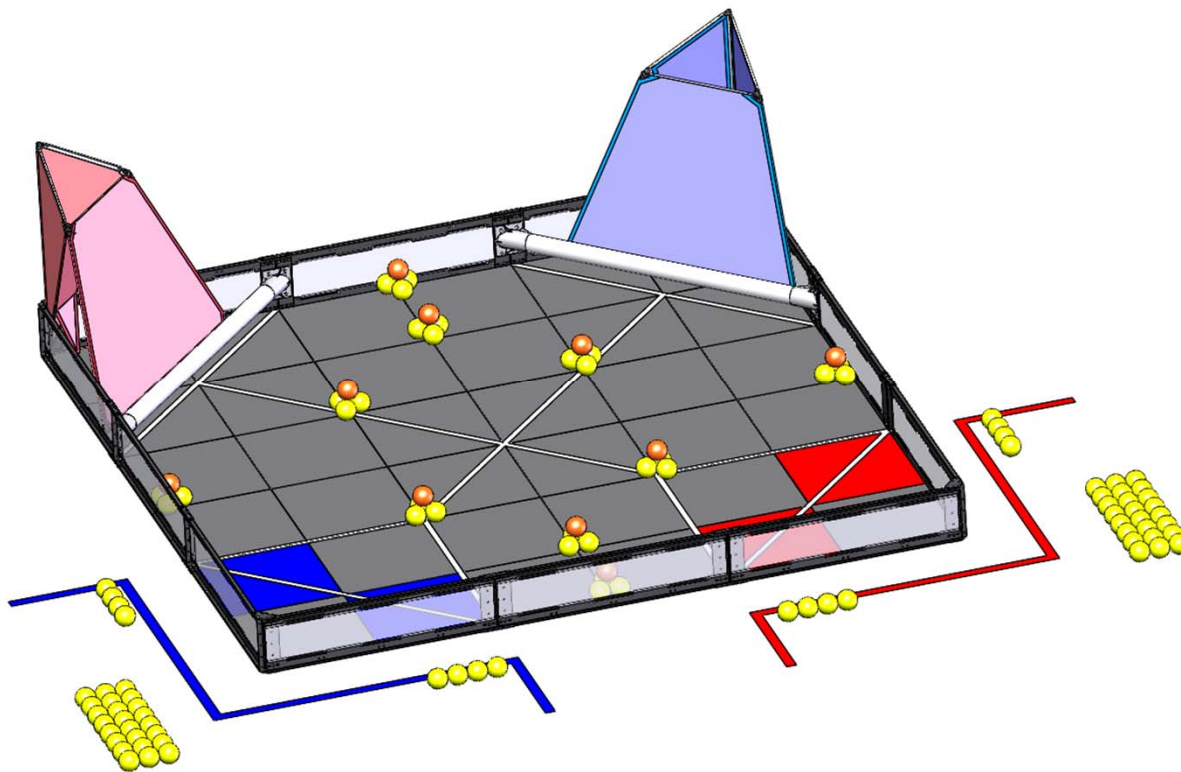
- We want the app to **encourage people to explore areas around them**. To do this we want to direct people towards **conversations about topics they are interested in**.
 - We determine topics in clusters with NLP (Natural Language Processing)
- We broadcast all messages to our NLP service which will...
 - use MonkeyLearn or Apache NLP to find categories the message falls into
 - store these associated categories along with the message in the database



SIGBOTS

Special Interest Group for Robotics

This Year's Game: VEX Nothing But Net



Point Structure:

- Ball Behind Bar
 - Yellow - 1pt
 - Orange - 2pt
- Ball In Net
 - **Yellow - 5pt**
 - **Orange - 10pt**
- Auto bonus - 10pt
- Lifting
 - Low (>6') - 25pt
 - **High (>12') - 50pt**

Caveat: robots cannot expand

Initial Design Ideas

Launchers

Flywheels (Nerf guns)

Slingshot

Drivetrain

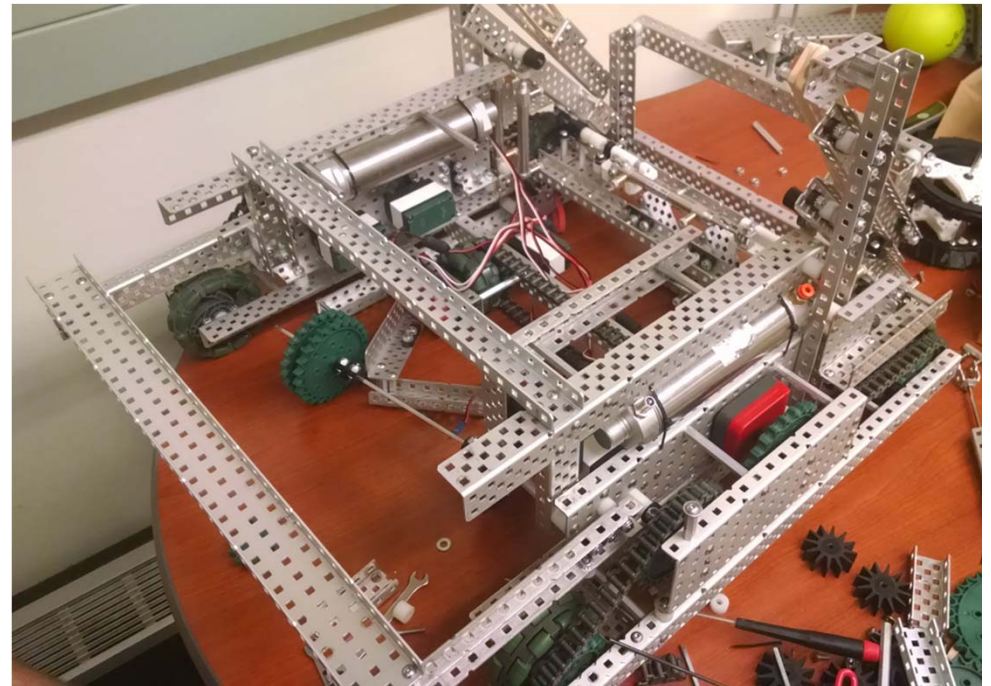
Use refined H-drive from last year

Holonomic drive

Software

Launch all match loads (30)

Coordinated lifting

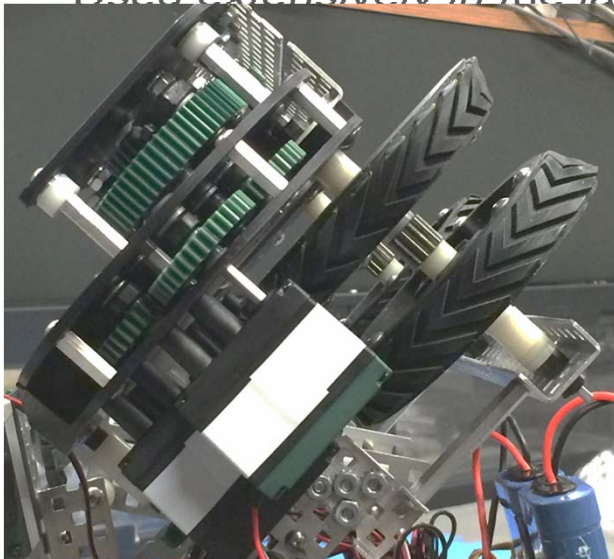


New Tools - 3D Printing

Unlimited number of 6"x6"x3" parts allowed this year

LulzBot TAZ 5 Printer

Used extensively in the launching system



New Tools - Phabricator

Industry software management tool

Issue tracking, code reviews, ticketing system

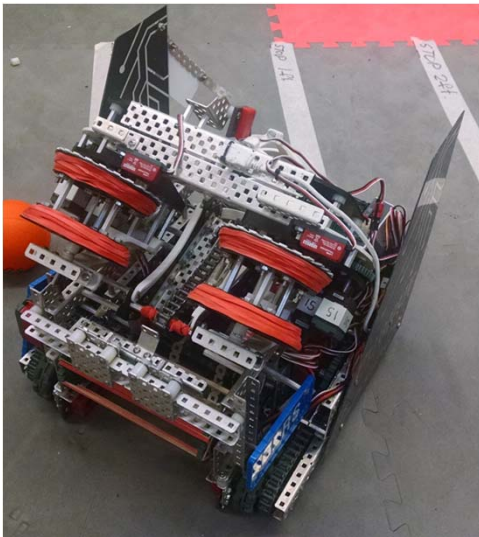
The screenshot displays the Phabricator web interface for a repository named 'kepler'. The interface includes a navigation bar with the Phabricator logo, a search bar, and various utility icons. Below the navigation bar, the repository name 'kepler' is shown with a 'Active' status and 'All Users' access. A 'Clone (SSH)' section provides a URL: `git clone ssh://git@phabricator.purduesigbots.com/diffusion/KEPLER/kepler.git`. A 'Projects' section lists 'Kepler'. A 'Locate File' section has a search input field. A 'Repository' section contains a table of recent commits.

Path	Modified	Author/Committer	Details	Committed
.arcconfig	0fe9065726f6	jhabibi	adding .arcconfig file for code reviews	Dec 26 2015, 2:48 AM

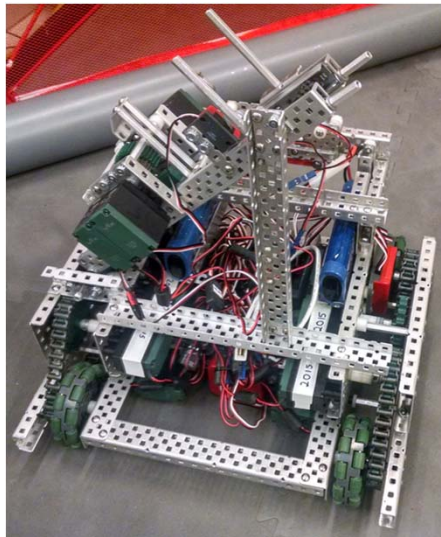
On the right side of the interface, a commit history sidebar is visible, listing commit hashes and authors:

- 7010dc6554be bhanford
- e2fa563753fb walke333
- 3846b1504f81 walke333
- 38124759c3e5 walke333
- d1e5674b3b00 bhanford
- a41b18e07616 walke333
- 96a3a3845395 walke333
- 8acf432058f2 walke333
- 8ffb93ff2b7a gtanzi
- 607a5b8adb6c walke333
- cf41f03c7660 walke333

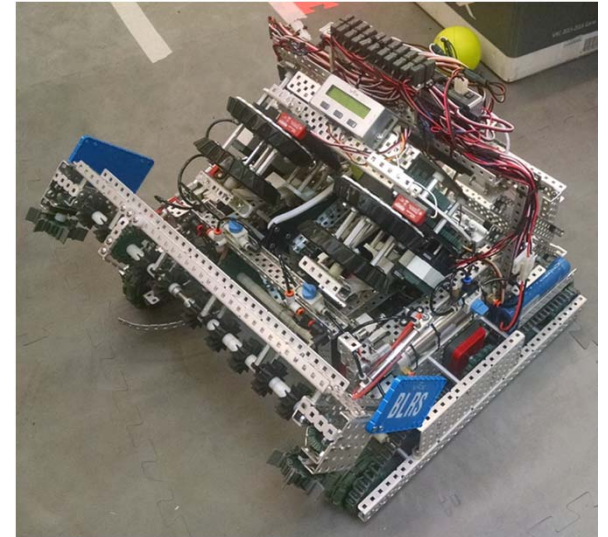
Final Robot Designs



Newton
(Flywheels - 15"x15")



Rock'Em Sock'Em
(Puncher - 15" x 15")



Kepler
(Flywheels - 24"x24")

Qualifier Competition

Held February 20th, 2016

Largest competition yet - 10 teams!



VEX U World Championships

Louisville, KY from 4/20 to 4/23

Focusing on the autonomous challenge

60 seconds

Score for any color

Rock 'Em Sock 'Em - estimated 300 points

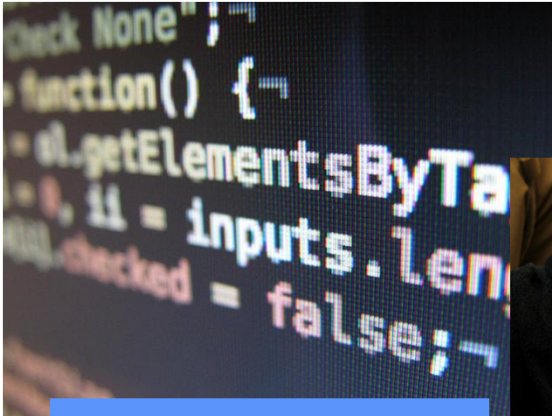




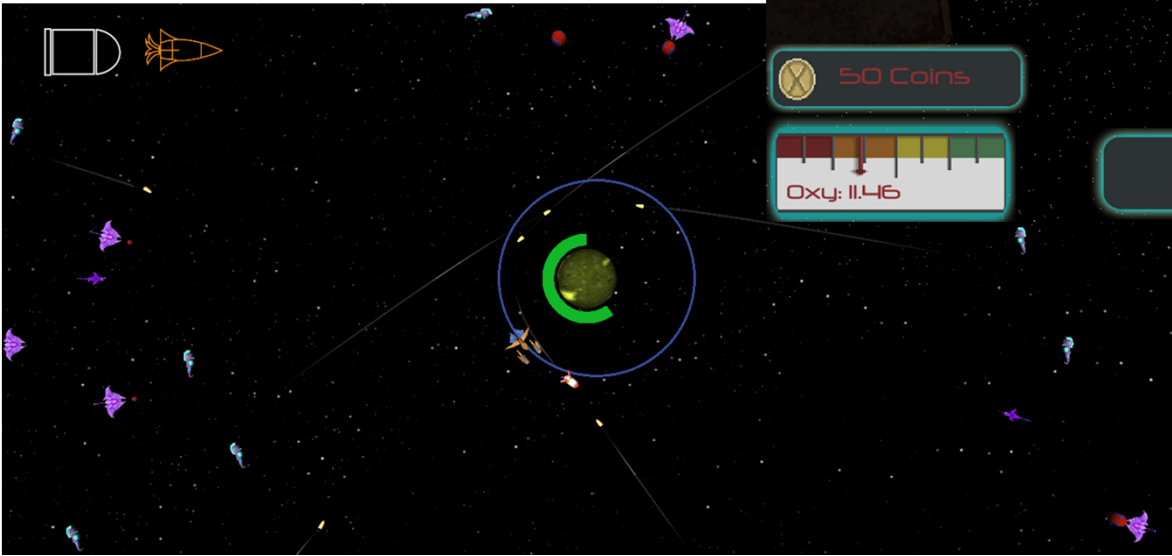
⁺siggd

ACM Special Interest Group on Game Development

Who We Are



Past Projects



20,000 Leagues Over the Sea



Space Salvage

Past Events

SIGGD Game Jam - Fall 2015

48 hour hackathon

16 participants

Global Game Jam - Spring 2016



Current Project

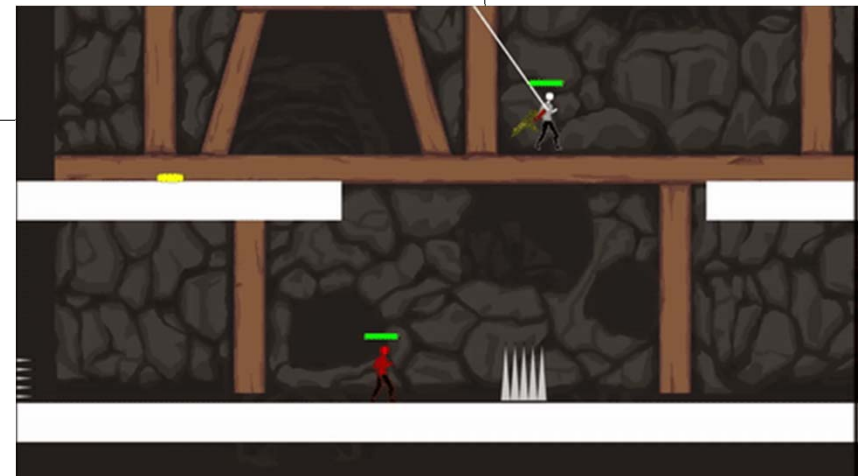
Grappling Hook Fighters (for lack of a better name)

Multiplayer/LAN fast-paced platformer shooter

Gameplay influences from Super Smash Bros, Duck Game, and a mixture of other indie games

Art influences from DnD/Fantasy themes

Base of programming down, polishing and gameplay testing/balance to follow



For the Future

Fall Game Jam - Sept. 16th - 18th

Enter Grappling Hook Fighters into the 2017 Independent Games Festival



Global Game Jam - Oct 10th - 12th

