A Student’s Perspective on Computer Science Outreach Methods

Paul Hudgins

About the Presenter

- Virginia Commonwealth University
- USMC veteran

  - Infantry, worked with college-aged young men
- 30-year-old undergraduate
- Internships at STR Software and NASA

My NASA Internship

- How to script a C&T processor using Python instead of STOL
  - Tried before with complex full-conversion solutions
- I created a lightweight *connection-based* solution
  - Based on database connection frameworks used in web servers
  - Low-risk incremental applications
  - Used to create an instrument simulator

Computer Science Outreach

- Fostering student interest in computer science is easy
    - Students are surrounded by technology
    - Massive efforts from other industries
- Fostering computer student interest in space careers is hard
    - Aggressive competition from other industries
    - The space industry appears underrepresented

Effective Programs at Different Scales

- **Capital One**
  - Massive, well-funded internship program
  - Prizes at many hackathons in Virginia and Maryland
  - Strong reputation with students
- **STR Software** (Small, 30-person company)
  - Small but committed presence at two targeted universities
  - Takes interns seriously
  - I didn’t stay with them, but I recommended one of their current developers

Common Methods

1. **Internships** - Key to building a reputation among students
2. **Career fairs / University job boards** - Key for first internships
3. **Hackathons** - Fantastic outreach method
4. **University career representatives** - Free recruitment services
5. **University talks** - Effectiveness depends on technical usefulness

Hackathons

- Open-ended programming competitions
- Driven by industry judges and challenges
- Teach students about new problem domains

Hackathon Do’s and Don’ts

DO

- Search for hackathons on mlh.io
- Review **last year’s devpost**
- Have engineers look at competitors’ devposts

DON’T

- Send managers instead of programmers
- Have a restrictive challenge
- Ignore technical difficulty when judging

Devpost (Event)

JUDGES


Ian Tyndall
Altria


Victor Wu
GitLab


Rodger Stuffel
C2 Technologies


Michael Ghaffari
UNOS


Chris Lumpkin
Ippon


Vicoria Barnes
Seeking EDU


David Holman
Snagajob


Lee Patterson
Vercend Technologies


Michael Morrison
CoStar


Chris Wash
CapTech Consulting


Robert Dahlberg
Vicom Infinity, Inc & Linux Foundation
Open Mainframe Project Linux


Trent Park
WorldView Solutions


Rahul Tapadiya
Authentic


Dohn Guyer
CarMax


Sumit Dang
Octo Consulting


Sean Jepson
Capital One


Michael Morrison
CoStar


Sean Jepson
Capital One

Prize: Samsung Galaxy VR Headset and Controllers

★ **CapTech Consulting (2)**
Prize: $50 Amazon Gift card x 4

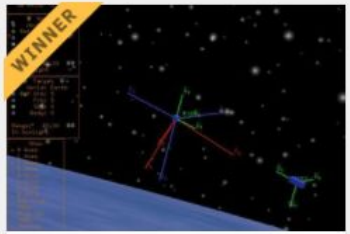
★ **Capital One (2)**
Best Financial Technology Hack.
Prize: First Place: $200 Amazon Gift Card x 1
Second Place: $100 Amazon Gift card x 4

★ **CarMax**
Best Use of Image Processing and Manipulation.
See "Detailed Challenges Link!" above for more details!
Prize: Echo Dots

★ **C2 Technologies (2)**
Aviation Mission Commander
We are looking for ideas and innovative solutions to enable users to have an immersive, virtual experience as an Aviation Mission Commander. This virtual experience will replicate the elements of an operating environment and provide the user the experience of planning and executing an aviation mission.
Your solution can be anything that allows the user to experience a true-to-life aviation mission. The proposed solutions to this innovation challenge should be fairly easy to implement and yield positive user experiences.
Prize: First Place: 2 drones, 2 Echo Dots, and 4 $50 gift cards x 4 Second Place: Echo Dot x

Devpost (Student)

PROJECTS 5 HACKATHONS 3 FOLLOWERS 0 FOLLOWING 0 LIKES



Automated Orbital Rendevou

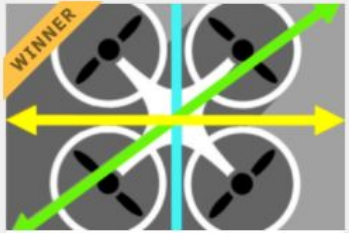
Uses computer vision for automated orbital rendevous, with no rangefinde

+1 ♥2 ●1

BreachHound

Assists with fraud analysis and response by identifying common point

+1 ♥2 ●0



RubberNeck

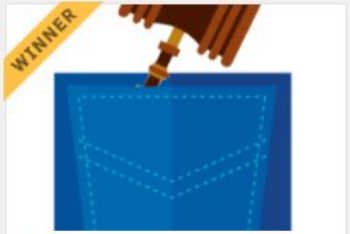
Revolutionizes control of fixed-camera drones

+1 ♥1 ●0

ReachOut

Enabling micro-loans that reach the world's most remote communities.

+1 ♥0 ●0



PocketLawyer

Uses speech recognition to assist users during interactions with law

+1 ♥3 ●0

ForwardParrot

Artillery direction software for the Parrot AR Drone 2.0, which keeps

♥0 ●1

Internships: Recruitment vs. Outreach

Recruitment:

- Primary objective is to retain intern
- Target is juniors and seniors with desired skills

Outreach:

- Primary objective is for students to talk about their experience
- Target is freshmen and sophomores that don’t know about the industry

Students Talk About Internships (A Lot)

DO:

- Have an outreach leader outside of the intern's project
- Organize activities
- Encourage students to use social media (appropriately)

DON'T

- Let your interns get bored
- Let experienced students see obsolete practices

A Space Industry Advantage: Ground Systems Are Freshman-Accessible

- Many promising underclassmen can’t find internships

  - Need database, web client, or mobile programming skills.
- Work in ground systems often doesn’t require these skills.

  - Simple desktop GUIs

  - Test automation

  - Assisting non-software engineers with scripting

Take-Aways

- Computer science outreach is competitive
- Students talk about their experiences
- Try a hackathon
- Exploit low skill barriers