A Student’s Perspective on Computer Science Outreach Methods

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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**
  - Altia
- **Rodger Stuffel**
  - C2 Technologies
- **Chris Lumpkin**
  - Ippon
- **David Holman**
  - Sheagejo
- **Michael Morrison**
  - CoStar
- **Robert Dahlborg**
  - Vironfinity, Inc & Linux Foundation
  - Open Mainframe Project Linux
- **Rahul Tapadiya**
  - Authentic
- **Sumit Dang**
  - Goto Consulting
- **Michael Morrison**
  - CoStar
- **Victor Wu**
  - GitLab
- **Michael Ghaffari**
  - UNOS
- **Victoria Barnes**
  - Seeing EDU
- **Lee Patterson**
  - Verend Technologies
- **Chris Wash**
  - CapTech Consulting
- **Trent Park**
  - WorldView Solutions
- **Dohn Guyer**
  - CarMax
- **Sean Jeppson**
  - Capital One

**Prize: Samsung Galaxy VR Headset and Controllers**

**CapTech Consulting (2)**

- Prize: $500 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 4

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*Images and names of judges have been omitted for privacy.*
Devpost (Student)

**Automated Orbital Rendezvous**
Uses computer vision for automated orbital rendezvous, with no rangefinder.

**BreachHound**
Assists with fraud analysis and responses by identifying common patterns.

**RubberNeck**
Revolutionizes control of fixed-camera drones.

**ReachOut**
Enabling micro-loans that reach the world’s most remote communities.

**PocketLawyer**
Uses speech recognition to assist users during interactions with law.

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