Suzanne Menzel

Experiencing Research Through OurCS

Opportunities for Undergraduate Research in Computer Science

COLLABORATORS
Elissa Booras, David Crandall, J Duncan, Tiana Iruoje, Charles Pope, Katie Siek, Lamara Warren

INDIANA UNIVERSITY
SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING
2001: A CS Odyssey
Opportunities for Undergraduate Research in Computer Science

Carol Frieze

Dr Sarah Loos
Google Research

OurCS in 2007

Cassidy Wichowsky
Junior CS Major @ IU

OurCS in 2017
Inspiration

RCWICs: InWIC 2004
Prof Gloria Childress Townsend
DePauw University

Bring IT On! in 2006

OurCS in 2007
Dr. Sarah Loos
Google Research
Opportunities for Undergraduate Research in Computer Science

Our Task

**KICKSTARTER**

- Investigate factors that make messages persuasive
  - Personal characteristics of the project creator
  - Language used in their project descriptions
  - Frequency of keywords
- Analyze text and blurbs of Kickstarter projects
- Utilize machine learning to predict success of a Kickstarter project

OurCS in 2017

Cassidy Wichowsky
Junior CS Major @ IU
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Conclusion

With a degree of 77% certainty, we can tell you if your kickstarter project will succeed using unigrams, personal characteristics, and readability scores.

However, with only 8 features (relating to personal characteristics and readability scores), we can predict success with 70% accuracy! This demonstrates the influence of these features and helps with the interpretability of our model. We can now understand what some of the factors are that affect persuasion.

OurCS in 2017

Cassidy Wichowsky
Junior CS Major @ IU
OurCS at Indiana University

Prof David Crandall
Computer Science

Prof Katie Siek
Informatics

Lamara Warren
Assistant Dean for Multicultural Affairs and Diversity

October 26-28, 2018
WHAT: Three Day Research Focused Workshop
WHO: Undergraduate Women from Indiana and the Midwest

AIMS:
✓ Work hands-on in small teams led by Faculty and Industry Researchers.
✓ Learn about Life in Graduate School.
✓ Hear from Leading Women in Computing Fields.
✓ Present a Poster.
✓ Meet and Socialize with Others who Share your Interests.
OurCS at Indiana University

Application site is open!
ourcs.sice.indiana.edu

October 26-28, 2018

Apply to OurCS
Recruitment Emphasis

Regional

• Students from large and small institutions all over Indiana

Under-represented groups

• Students from HBCUs
• First-generation college students
• Low-income students
• Persons with Disabilities

Motivation

• Travel is easier and less expensive.
• Greater chance of establishing an ongoing mentoring relationship.
• Reach populations that ordinarily would not consider research careers.
Goals

1. Provide each participant with an authentic research experience.

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<tr>
<th>Day</th>
<th>Activity</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
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<td>Mini-Talks</td>
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<td>Saturday</td>
<td>Poster Session</td>
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<td>Student Panel</td>
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<td>Presentations</td>
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2. Provide support and information about research, graduate school, and the application process from the perspectives of faculty and students.
Authentic Research Experience

12+ Projects

• Academia: IU, CMU, Notre Dame, IUPUI, Rose-Hulman, IUNSI
• Industry: Google, Oracle
Authentic Research Experience

12+ Projects

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• Industry: Google, Oracle

Prof Andrew Miller  
IUPUI

Prof Katy Börner

Dr Kate Eddens  
IUNSI

Dr Sarah Loos  
Google Research
Authentic Research Experience

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- Industry: Google, Oracle

Best Practices

- Advice from CMU leaders
- Teaching coach
- Graduate students as co-leaders

Rin Metcalf
Pam Thomas, Notre Dame
J Duncan
Sarah Spall
How to efficiently process large datasets has become a central topic in a number of areas in computer science, including databases, machine learning and data mining. In this project participants are expected to design, implement, and evaluate algorithms for popular queries on large scale datasets using limited computational resources (space and time). For example, to find most frequent items in a long sequence of items (e.g., IP addresses, keywords), to estimate the average degree of nodes in a large graph (e.g., social network, web graph), etc.

**Research Area:** Big Data Algorithms  
**Co-leaders:** Profs Qin Zhang and Yuan Zhou
Creating Custom Technology to Improve One's Quality of Life

Technology surrounds us — from the computer in your microwave to the speaking digital assistant on your phone, however these commodity technologies are created in a one-size-fits-some style that people appropriate into their everyday lives. In this research project, we will reflect on personas of underserved communities in technology — from rural older adults to pregnant teens to low socioeconomic status children — to develop custom, interactive technology to assist them improve their quality of life. In this workshop, we will explore barriers the target populations face, brainstorm sociotechnical solutions, and bring the solutions to reality. Aspiring researchers will learn how to distill design guidelines from qualitative data; prototype physical, interactive systems; 3D print and laser cut; and program embedded systems.

Research Area: Sociotechnical Systems
Virtual assistants such as Apple's Siri and Amazon's Alexa help us with daily tasks from checking the weather to controlling smart home devices like lights and door locks. But they're limited by the fact that they can't understand very much about what is going on around them; a user asking Alexa for “help” wants something very different depending on if they're walking into a dark room with an armload of groceries, trying to solve a crossword puzzle, or have fallen and broken a leg. Participants in this project will investigate combining visual data from cameras, audio data from microphones, and deep machine learning to recognize the activities that are going on near a smart device.

**Research Area:** Computer Vision and Audio Processing

**Co-leader:** Prof David Crandall
Speakers

Prof Kay Connelly
Associate Dean for Research

Maggie Oates
CMU

Haley MacLeod
IU and Facebook

Dr Timnit Gebru
Microsoft Research
What do you think research entails?

Research to me is to embrace uncertainty and be open to get insights from any stakeholder or experiment at any stage of the research process. It is to believe that anything can bring knowledge and learn how to filter, process and translate the knowledge you get.
THANK YOU

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