

iAAMCS DREU

Monica Anderson

Agenda

- DREU Program Activities
- Mentoring
- Other synergistic activities

DREU Cohort activities

Feb-Apr

DREU Application/
Selection

May-Aug

DREU experience

Sep-Jan

Post-DREU
Mentoring

DREU Cohort activities

Statistics

Feb-Apr

**DREU Application/
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Mentoring**

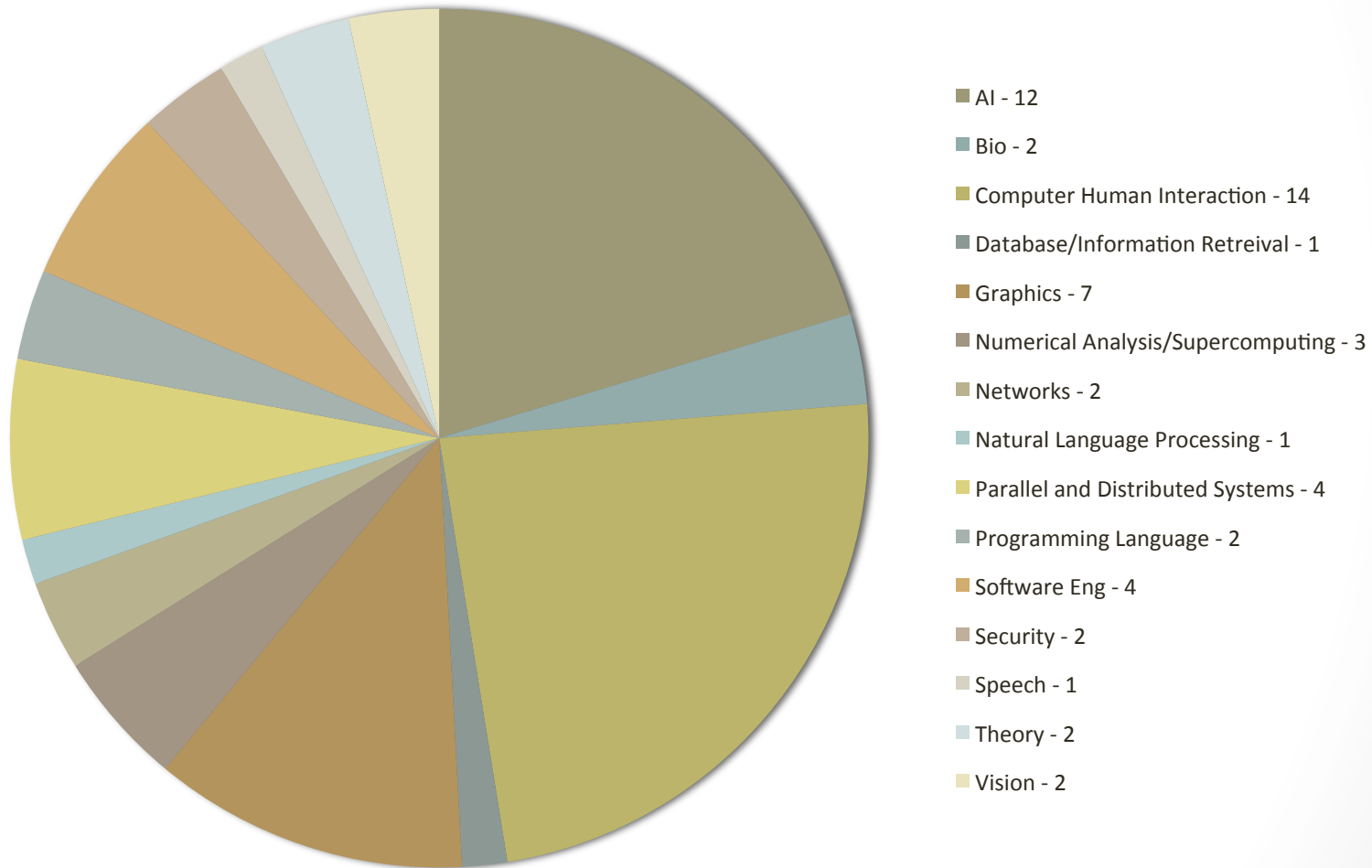
2013

- 18 iAAMCS students in 11 different labs
- 3 female students and 15 male students
- Average GPA – 3.19

2014

- 16 iAAMCS students in 13 different labs
- 7 female students and 9 male students
- Average gpa - 3.32

Research areas of mentors



DREU Cohort activities

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Mentoring

- Provide students with high level understanding of research and mentor expectations- **iAAMCS cohort meetings**
- Track student progress - **Students' weekly journals**
- Verify mentor expectations are being met - **Mentor progress reports**
- Encourage student to reflect over the overall research goal and their contribution to the research project - **Student final report/website**
- Receive feedback on student performance - **Mentor final report**
- Provide mechanism for mentor to provide final feedback to student
- Assist with poster preparation - **iAAMCS research principles training**

iAAMCS Cohort meetings

- Twice per summer (once in May-beg of June and one mid-end of July)
- 1 hour online meeting (50 slide deck)
- Topics
 - Overview of iAAMCS
 - State of African American PhD production
 - What is research?
 - What is the purpose of an REU?
 - Working with your research advisor (managing expectations)
 - Important research tools (i.e. latex, etc)
 - Creating posters and abstracts

iAAMCS Cohort meetings

Overview of iAAMCS

The Institute for African American Mentoring in Computing Sciences (iAAMCS, pronounced "i am cs") serves as a national resource for all African - American students and faculty.

The objective(s) of iAAMCS is to:

- Increase the number of African-American degrees in computing sciences
- Promote and engage students in opportunities
- Add more diverse researchers in workforce

What is research?

- Research is the art of doing a piece of work that moves knowledge forward and helps us to understand ourselves and the world around us better
- Research is a struggle with ourselves
- Research is a way to keep your brain young
- Research is a part of our life and does not start at 9am and finish at 5pm

Publishing

- Papers are the "coin" of the realm
- Papers are important for future error
- Research must be shared to be res
 - Can do oral presentations but limit
 - Research must be published in a v the largest number of people
 - Written accounts of research resu
- Papers help you set doable goals
- All the words and sentences shoul
- Minimum overlap between your papers
- Use of spell checker is essential
- Must use well-organized, formal, succinct English
- Practice is the only way to learn to write well
 - In the beginning, allow yourself a lot of time to perfect any paper

Graduate degree disparity

degrees per	PhD in computer science
%)	31 (2%)
0.3%)	504 (32.4%)

tions

ources to solve problems
blems
yourself, ask graduate students,

- Use informal opportunities to inform your advisor on your progress or tasks that you have completed

DREU experience tracking

- Establish website with journal in 1st two weeks (tied to second payment)
- Both students and mentors provide progress report around week 5 (tied to third payment)
- Final website, completed journal entries and final reports (tied to fourth payment)
- Website, journal entries and final report accessible by public

Ihudiya Finda Ogburu (Harvard) @ DePaul with Sheena Erete

Week 6 - Interviewing and Interview Protocols

Here are some tips that I learned from this week about interviews and interview protocols. These tips were obtained by our mentor and from our readings:

- Ask questions that you developed to yourself or a friend in order to understand if they are conversational or if they will provide responses that would potentially provide useful information
- Sometimes interview questions will involve probing (asking further questions to further understand an interviewee) or prompting (providing examples to clarify a question)
- Try to remain as neutral as possible when performing an interview. Use statements, comments, or gestures that encourage conversation.
- Understand your audience or interviewees and use the appropriate amount of technical terms or field specific terms in your interview

There are plenty more lessons learned, but I thought I would share a couple.

Personalized and reflect their journey



Research Scientist

Jassiem Ifill (Morehouse) @ Minnesota with Stephen Guy

Collision Avoidance with Unity3d

Jassiem Ifill

September 12, 2013

Rigorous multidisciplinary
research

Abstract

The primary goal of the research presented in this paper is to achieve natural crowd simulation and collision avoidance within the Unity3d game engine as it is becoming a very popular choice of development software.

Throughout this summer, a section of our research group was focused on using the Unity3d game engine and we attempted to use two different methods of achieving Collision Avoidance to see if they were compatible and feasible within the Unity3d engine. As such, this paper builds upon a previous Predictive Force Collision Avoidance method and use a variation of it in order to achieve a working form of Collision Avoidance within the Unity3d engine.

The final result of this project was a fully operational windows application that allows the user to choose between two different algorithms for collision avoidance. After that, the user is then able to use this version of the Predictive Force Collision Avoidance Model to either: play a simulation containing agents with working collision avoidance with as many agents as desired, render a simulation from a file, or export a simulation with a specified amount of agents and length to a file.



Olabode Anise (Auburn) @ Clemson with Juan Gilbert

Abstract

Gesture recognition devices have become more prevalent in homes across the world as smart TV technology becomes more commonplace. The Clemson University Human-Centered Computing Lab has been working to develop a cable interface that is controlled exclusively by gesture. This project aims to validate the findings of a prior study which gathered gestures to control a cable interface.



Final reports are a mini
publication

Gesture Validation in Television Interfaces

OLABODE O. ANISE II

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Abstract

Gesture recognition devices have become more prevalent in homes across the world as smart TV technology becomes more commonplace. The Clemson University Human-Centered Computing Lab has been working to develop a cable interface that is controlled exclusively by gesture. This project aims to validate the findings of a prior study which gathered gestures to control a cable interface.

I. INTRODUCTION

The typical way of interacting with a television is via remote control.

The current challenges facing television interaction involve the design of current standard remote controls. They feature numerous buttons that are rarely used by most consumers, thus preventing users from accessing all of the capabilities provided. Also, the configurations of remote controls do not line up with the interface of the televisions that they correspond with. The users have to constantly switch between viewing the information on the screen and searching the remote for different buttons to bring up the different menus.

In order to combat this many gesture recognition devices have been developed; however, they've fallen short because of the design of the gestures. Designers have developed gestures that aren't intuitive.

In the past, many studies have been done to see how users interact with gesture recognition devices. While those results have been duly noted, no study has gone to the lengths to confirm the gestures they identified by another group of users. This study has done this.

II. RELATED WORK

Hand gesturing has been one of the naturalistic and common ways of human-to-human communication. Any hand movement could

be identified as a potential gesture:[8]. HCI researchers and practitioners have studied hand gestures in the pursuit of designing input gestures that inherit everyday gestures qualities :[2]. Gesture scholars agree that their are different kind of gestures. Some differ in their occurrence, such as those performed during speech, and some differ in their physical structure and how they are performed:[6]. Technology today has embraced this input modality and integrated it into their interaction design, taking into consideration the metrics that factor into the differences amongst user-defined gestures such as culture. Gestures frequency, viewpoint, rhythm, and description of motion are different amongst various cultures:[1, 4]. Research scholars had proposed a large number of gesture taxonomies in the literature:[6, 2],however, no standard guidelines for gesture taxonomies have been set for gesture interaction design.

Research shows that various gestures have often been defined by designers not users. Subsequently, users would have to learn these gestures:[9, 7, 3]. The latter makes the process of developing gestures unnatural. Despite the skillful design of such gestures, they are arbitrary gestures which have been designed specifically for reliable recognition:[5, 8]. This method of designing gestures might be suitable for prototyping. However, it is not useful for determining which gestures match those that would be chosen by users.

iAAMCS resources for publications

- Focus on activities that apply to DREU
- Encourage publication of results
 - Abstract to Tapia poster competition
 - Posters to external competitions
 - DREU Final Report
- How to write an abstract
- How to prepare a poster
- Samples of CVs, posters and abstracts
- Links to resources on grammar, latex and citation management

iAAMCS resources

Writing an abstract

Abstract Statements

Statement on rationale
Objectives
Methods
Results
Conclusions



Abstract

Statement on Rationale

"Robotic systems using unmanned aerial vehicles (UAVs) are becoming more practical in military applications. However, current systems utilize a one (or multiple) operator/one UAV interface and are difficult for inexperienced operators to use."

Answers questions like:

- What problem does this research attempt to solve?
- What impact does this problem have and on whom?
- Who is most interested in this research and why?
- How is that problem solved without this research?

iAAMCS resources

Preparing a poster submission

- Decompose a sample abstract into its parts

Preparing a poster submission

- Two pages in length (very strict about maximum length)
- Includes the following sections:
 - Creating an abstract
 - Introduction
 - Approach
 - Methods
 - Results
 - Conclusion



Preparing a poster submission Approach

- Incorporate tables and figures where you can
- Edit judiciously (If a sentence can be deleted without changing the meaning of the paragraph, I delete it)
- Should be longer than the introduction but leaves room for the last three sections (methods, results and conclusion)

Answers some of the following questions:

- What is the new proposed approach?
- What inspired the new approach?
- Has this approach had success in other areas?
- Why will the new approach work?
- What is the new approach? (i.e. software created/used, algorithms, formulas, models, hypotheses, studies, etc)

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Mentoring

- DREU experiences occupy a small part of the undergraduate research career
- Research mentors often do not provide ongoing mentoring
- Students should be referred to other iAAMCS programs as appropriate
- “As appropriate” requires that we periodically assess students
- Referral process managed by mentor contact form

Mentor contact form

Goals: Provides opportunity for discussion, to address misconceptions (i.e. paying for grad schools or requesting recommendation letters, etc) and to provide resources

Identifies 8 areas of possible intervention

- Graduation
- Goals discussion
- Publishing
- Graduate school acceptance
- REU applications
- Fellowship applications
- Research poster competitions
- Undergraduate research conference travel

Mentor contact form example

Graduation

Discussion notes: As students progress through their major, graduation dates can change. We should document the new dates as they occur and note the reasons for the change.

Information gathering:

If a change from last quarter, note reasons for change.

- Classes not completed due to missing requirements
- Classes not completed due to grade or withdrawal
- Change in major
- Entering to programs that delay graduation (i.e. coop)
- Other: _____

Intervention discussion

Problems successfully completing classes due to insufficient background

- Online resources
- On-site tutoring
- Study groups

Mentor contact form example

Part 2: Goals

Italicized notes prompt mentor to bring up issues that may be relevant (based on the AARCS targeted presentation)

Discussion notes: During the first quarter, the goals discussion should be in depth. Many students do not have family members that have attained an advanced degree. In addition, there may be family pressures to get a job for fear of additional debt. This discussion should present the student with a clear picture of the options for advanced degrees

Advanced degree advantages

- Start with a high salary even for masters degrees (raises between 4-6% will make it difficult for a student to “catch up” with the masters salary since it starts higher and the percentages are higher).
- Many jobs require an advanced degree
- Jobs that require an advanced degree are more focused on creating new technologies
- There is a wider range of jobs available in non-academic institutions (i.e. corporate labs, military labs and national labs, etc). In addition, advanced degrees can provide opportunities for entrepreneurship through patents and company spin offs.

Mentor contact form example

Part 2: Goals

Common misconceptions

- **Increase debt** – Students that are citizens can get funding to attend graduate school which includes tuition, medical insurance and a stipend
- **More classes** – Graduate students often take fewer classes (2-3). Classes are more focused on specific topics. The requirements for some classes may be projects and papers, rather than tests
- **I am not sure what I would do for research/I am not sure what I am interested in** – When starting graduate school, many students don't know what their specialty will be. It is common for students to take a wide range of classes with the idea that classes that most interest them may be a good research direction. Research is about solving problems that matter to you. It includes creativity and persistence. Research creates as many questions as it answers.

Mentor contact form example

Part 2: Goals

- **I am not sure I can be accepted** – Acceptance into graduate school relies upon many factorings including GPA, GRE scores, essays, undergraduate research and recommendations. There are GRE courses available, assistance with writing essays and REUs can provide strong influential recommendations. In addition, often acceptance by a program may rest upon your advisors talking to someone at the graduate school or via networking.
- **I am not sure about moving** – This is a common concern. When considering graduate schools, you can look at programs near home. Also consider schools with a diverse population. You may find that you make friends for like
- **I would like to work first and come back** – Some students do come back but it can be difficult to shift financial responsibilities that are accumulated based on a corporate salary. It is also difficult to work and go to graduate school. For some, it can be difficult to juggle work and academic responsibilities. In addition, the contacts that you may need for graduate school acceptance may grow cold.

Mentor contact form

Action plan

Outcome of meeting is a list of actions linked to the relevant activities

What are the agreed on actions for the student that have been identified

- Identify letter writers (Part 4, 5, and 6)
- Research faculty in the research area that you are interested in (Part 4, 7, and 8)
- Take a GRE prep class if needed (Part 4 and 6)
- CV prepared (Part 4, 5, and 6)
- Assist with writing research statement (Part 4, 5, and 6)

External referrals that may apply

- Writing workshop
- REU training
- REU placement assistance
- Apply for travel funds
- Doctorial consortium
- Addition to aaphdcs mailing list (once grad student)
- Peer mentoring
- Other:

Agenda

- DREU Program Activities
- **Mentoring**
- Other synergistic activities

iAAMCS Mentoring - Current

iAAMCS Mentor Corp – Mentors trained/demonstrated ability to mentor students with non-traditional needs

iAAMCS Scholars – DREU students that have the aptitude and attitude to attend graduate school

- OlabodeAnise
- Troy Hill
- TobechukwuEzekwenna
- Cecili Reid
- Andre Parrott
- Mathew James
- Ogenna Esimai

Mentors and students “meet” periodically; use the mentor contact form to guide conversations

iAAMCS mentoring – Year 3

- Mentor Corp/Scholar program will remain
- Collaboration with MentorNet to use the mentor contact form as a prompt for interactions between mentors and students
- Will allow our culturally sensitive mentoring focused on graduate school matriculation to be expanded beyond just the limited mentor corp
- Provides scalability that would otherwise be impossible to attain

Other synergistic activities

- Working with many discipline specific mentoring activities
- BPAI – Broadening Participation in Artificial Intelligence
 - Provided travel funding to 2014 AAI conference
 - Additional mentoring workshop and networking activities
- BPDM – Broadening participation in Data Mining
 - Participated in broadening participation panel during 2014 Conference on Knowledge Discovery and Data Mining (KDD)
 - Discussed issues of participation and mentoring

iAAMCS DREU - Conclusion

- GPAs of participating students is growing slightly
 - Difficult to do in this competitive climate
 - Will continue policy to engage promising students early
- Mentors are spread across many sub-disciplines within CS
 - Would like to grow participation of mentors in security and database and information retrieval as these are high growth areas
- Mentoring approach as been successful
- Future goals are focuses on scaling