

Weekly Journal (Diary)

Tuesday May 1, 2018

Created REU profile online

Met Research Program Co-ordinator: Dr. Hernisa Kacorri (Associate Professor) at the Intelligent Assistive Machines (IAM) lab at the the university and had a research talk about the project and project expectations

Talked about the initial commencement of the REU internship program scheduled for Monday May 21 - Friday July 27, 2018

A 10 week internship program totaled \$7,000

\$700 per week

Talked about REU Commencement and benefits

Duration: 10 weeks

Completed the following Forms:

signed letter of agreement for the CRA

completed W-9form (US citizen+GreenCard holder) and the optional Direct Deposit form

Read the W-8 Form (International students) to understand the differences

Wednesday May 2, 2018

Attended ISchool Symposium @ Stamp Student Union from 5-7pm to learn new techniques to benefit REU internship program.

REU web site has accessibility issues and communicated this problem to Access Computing officials

submitted 1st milestone requirements to Aimee with the advise of Nancy

working with Aimee to make DREU website more accessible

Thursday May 17, 2018

11:00am meeting with the Intelligence Assistive Machine (IAM) group with Dr. Kacorri.

Took a group photo for IAM

Monday May 21, 2018

Dr. Kacorri, send me an email with To Do List:

Given the circumstances, your final internship dates are:

DREU+AccessComputing Research Program

- Start: June 1, 2018

- End: August 17, 2018 (a total of 10 weeks)

My to-do list:

Contact the student that might help in the summer (ask availability for these 10 weeks and to share with me his CV meet on Wednesday at 12:30pm)

Contact AccessComputing for more information about financial support for that student and how many hours

Reply to the email from DREW

Dr. Kacorri, Associate Professor and mentor, and Kyungjun Lee, Ph.D student, helped complete and submit my 1st milestone for DREU+AccessComputing Program

I was unable to complete and submit the milestone requirements online due to accessibility issues.

I reported the accessibility issues to Access Computing officials.

Received email confirmation from Claire, The program director.

Dr. Kacorri assigned me a desk in the Intelligent Assistive Machines (IAM) lab in the Human Computer Interaction (HCI) office for the program

She requested from the university a key and access code for entry in to the office and lab. I

shared the lab with Kyungjun Lee, Ph.D student and mentor and several other graduate students

Office key or access requested

Tuesday May 22, 2018

Emailed Mohamed Khalid, Ph.D. student regarding Tutoring for the Research program

Email Mahmoud, Ph.D. student for tutoring position

Asked Mohamed to send CV to Dr. Kacorri

Tutor Interview scheduled for Wednesday May 23, 2018 at 12:30pm

Emailed Dr. Brianna Blaser, for tutor funding

Brianna Blaser, Ph.D.

Counselor/Coordinator, DO-IT

Emailed Brianna Blaser, for transportation assistance to the Research program at College Park.

Received Tutor Application Form

Send Tutor Application Form to Mohamed Khalid to complete for DREU position

Wednesday May 23, 2018

12:15pm - Both myself and Dr. Kacorri had a meeting/interview with Mohamed Khalid, Ph.D. student for the DREU program Tutor position

Send a reminder to Mahmoud for DREU Tutor position

Send him the Tutor Application Form

Thursday May 24, 2018

Attended the HCIL 35th Annual Symposium

Computer Science Instructional Center (CSIC)

HCIL 35th Annual Symposium, All-day Event, Held at: University of Maryland Computer Science Instructional Center (CSIC) Building.

8:15 – 9:00 Registration & Breakfast

9:00 – 10:15 Plenary Talks

Welcome Address Niklas Elmqvist, Director of Human-Computer Interaction Lab

Laurie Locascio, Vice President for Research of the University of Maryland

Keith Marzullo, Professor and Dean of the College of Information Studies

35 Years of the HCIL Symposium

Key speakers:

Niklas Elmqvist, Director of HCIL

Ben Shneiderman, Professor at the Department of Computer Science

Catherine Plaisant, Senior Research Scientist at the UMD Institute for Advanced Computer Studies

Ben Bederson, Professor and Associate Provost of the Teaching and Learning Transformation Center

Allison Druin, Professor Emerita at the College of Information Studies

Jen Golbeck, Professor at the College of Information Studies

Mona Leigh Guha, Director of the UMD Center for Young Children

The Frontier of Privacy and Manipulation Online

Jennifer Golbeck, Professor of the College of Information Studies

10:15 – 10:30 Break

10:30 – 11:45 Keynote Talks:

Designs of Waiting: Delay, Latency, and the User Experience

Jason Farman What Patients Share, What Doctors Want them to Share: Patient-Generated Data in the Clinic

Eun Kyoung Choe Back to the Future: How People Construct New Creative Ideas from Old Knowledge, and How Technology can Help

Joel Chan Full-Day Tutorial

Introduction to Usability Testing Bill Killam

10:30 AM – 4:45 PM

11:45 – 1:00 Lunch

1:00 – 2:45 Security & Privacy

Exploring Educational Messages in End-to-End Encryption Wei Bai  
User Comfort with Android Background Resource Accesses in Different Contexts Seth Rabin

Human-Computer Interaction

CoBlox: Making Industrial Robotics Programming Accessible to All

David Weintrop

Time for Break: Understanding Information Workers' Sedentary Behavior Through a Break Prompting System Yuhan Luo, Bongshin Lee, Donghee Yvette Wohn, Amanda L. Rebar, David E. Conroy, Eun Kyoung Choe  
Training Citizen Scientists to Appraise Qualitative Impact on Watersheds in StreamBED VR Alina Striner & Jenny Preece  
Visual Analytics & Visualization

Prescriptive Analytics: From Data to Action Catherine Plaisant, Fan Du, Ben Shneiderman  
Data-Driven Storytelling Zhenpeng Zhao, Niklas Elmqvist  
Face to Face: Evaluating Visual Comparison Brian Ondov  
Evaluating Information Visualization in Virtual Reality with Economists Using ImAxes Andrea Batch, Andrew Cunningham, Maxime Cordeil, Tim Dwyer, and Niklas Elmqvist  
An Embarrassment of Riches: Inconsistent and Overlapping Ontologies for Coded Data Analytics Sigfried Gold & Niklas Elmqvist  
Full Day Tutorial (cont'd)

Introduction to Usability Testing Bill Killam 10:30 AM – 4:45 PM

Half-Day Tutorials

Cognitive Science in HCI Tim Clausner 1:00 PM – 4:45 PM  
Visual Design for Interaction Bootcamp Liese Zahabi 1:00 PM – 4:45 PM

Half-Day Workshops

Design Thinking / Design Techniques Tamara Clegg, Elizabeth Bonsignore, Evan Golub, et al. 1:00 PM – 4:45 PM  
Building Community Partnerships for Aging Research Amanda Lazar & Eun Kyoung Choe 1:00 PM – 4:45 PM

2:45 – 3:00 Break

3:00 – 4:45 Accessibility & Inclusion

Lowering the Entry Bar for Inclusion: Making Interfaces Easier for All

Gregg Vanderheiden & Bern Jordan

Co-Design of an Augmented Reality Magnification Aid for Low Vision Users Lee Stearns

What Blind User Trajectories Tell Us About the Environmental Factors in Indoor Navigation Hernisa Kacorri

Crowdsourcing To Share, or Not to Share? Community-Level Collaboration in Open Innovation Contests Yla Tausczik, Ping Wang

Prototyping

Taking Prototyping to the 360th Degree Evan Golub Visual Analytics & Visualization, cont.

Analyzing the Evolution of Relationships with Dynamic Hypergraphs Catherine Plaisant, Paola Valdivia, Paolo Buono, and Jean-Daniel Fekete ATOM: A Grammar for Unit Visualizations Deokgun Park

Social Media

Exploring Practices on the Move: Facilitating Learning Across a Neighborhood Lautaro Cabrera, June Ahn, Jason Yip, Tamara Clegg, Kenna Hernly, Elizabeth Bonsignore, Caroline Pitt, Daniel Pauw  
Designing to Illuminate Children's Scientific Funds of Knowledge Through Social Media Sharing Kelly Mills, Elizabeth Bonsignore, Tammy Clegg, June Ahn, Jason Yip, Kenna Hernly, LC Cabrera, Caroline Pitt  
Full Day Tutorial (cont'd)

Half-Day Tutorials (cont'd)

Half-Day Workshops (cont'd)

4:45 – 6:00 Demo & Poster Session

Visualization of Ranked Lists Pranathi Mylavarapu  
Information Olfaction: Harnessing Scent to Convey Data Biswaksen Patnaik, Andrea Batch & Niklas Elmquist  
ConceptVector: User Driven Text Mining Deokgun Park  
Science Everywhere and NatureNet: Place-based Display Daniel

Pauw#HandsOffMyADA: A Twitter Response to the ADA Education and Reform Act Brooke Auxier  
Vistrates: Shareable Dynamic Media for Visual Analytics Andreas Mathisen  
Multi-Display Environments for Visual Data Exploration Tom Horak  
The Impact of Group Size on the Discovery of Hidden Profiles in Crowds Xiaoyun Huang  
Will Too Many Editors Spoil the Tag? Conflicts and Alignment in Q&A Categorization Joohee Choi  
Kids Training AI: Exploring Interactions with a Teachable Machine Jaina Gandhi & Raj Parikh  
Object Recognition for the Blind: Using First-Person Vision Kyungjun Lee  
Promoting Data Science for Accessibility with Publicly Available Datasets Mayanka Jha & Riya Chanduka  
Understanding User Tradeoffs for Search in Encrypted Communication Ciara Lynton  
Does that Make Sense to You? First Steps Toward Evaluating the Quality of Security & Privacy Advice Everest Liu  
Intelligent Interface to Help Blind Users Train a Personalized Object Recognizer Jonggi Hong & Jaina Gandhi

Completed and Submitted Documents

1st Milestone Requirements

DREU Participants 1st Milestone (Before DREU Program Starts)

Read the DREU Participants Procedures and Requirements Summary

Completed and signed the following documents submitted on the DREU online portal:

Letter of Agreement

Tax Documentation (W-9 form) : for students who are U.S. Citizens or Permanent residents.

Direct Deposit

Completed the DREU Pre-Survey

Dr. Kacorri, Assistant Professor and mentor and I entered start and end dates for the DREU experience that are agreed upon

Weekly journal of REU progress (results/finding/algorithm/experience)

Week 1-10

Data Collection Team



Dr. Hernisa Kacorri, Assistant Professor and mentor, Kyungjun Lee, Ph.D. student and mentor and Ebrima Jarjue, blind, Undergraduate student, and REU participant

June 2018

## 1 Introduction

This project is to collect data, such as images and videos, that can represent the blind community. The existing datasets currently do not represent this specific population as they are collected by sighted people. At our meetings and during research talks, we discuss data collection methods.

Week1: Monday -Friday June 11 - 15, 2018

Dr. Kacorri, recommended me to learn LaTeX to write weekly journal and progress report

Created LATEX profile/account

Went over some LATEX tutorials

Week2 Monday - Friday June 18 - 22, 2018

Learned some basic HTML syntax

Reviewed DREU website

Went over the milestone requirements to understand DREU expectations

Had research talk with Kyungjun Lee, Ph.D. student and mentor about the project and graduate studies

Week3: Monday - Friday June 25 - 29, 2018

Read Dr. Kacorri's scholarly research article titled "People with Visual Impairment Training Personal Object Recognizers: Feasibility and Challenges "

I learned from the research paper, the difficulties the blind and visually-impaired has to go through with technology

How sample statistics of sighted people are used to make products to help the blind and visually-impaired.

How these sample statistics affected the aforementioned community

How her research is to avoid similar mistakes repeated by other researcher teams

Went over the Html tutorials

Had a research talk with Kyungjun Lee, Ph.D student and mentor, trying to understand his viewpoints about the upcoming Data collection project.

Week4: Monday - Friday July 2 - 6, 2018

re-read the scholarly article to help understand my upcoming project

Read the second scholarly article "BigDataDeepLearning ChallengesAndPerspectives" to help understand problems related to accessibility issues

Learned about Deep Learning and AI (Artificial Intelligence) and Machine Learning to understand the process

DREU DataCollectionImageRec

DataCollectionImageRec

Data collection team:

Dr. Hernisa Kacorri, Assistant Professor, project leader and mentor

Kyungjun Lee, Ph.D. student and mentor

Dan Yang, incoming graduate student and collaborator

Ebrima Jarjue, blind, Undergraduate student, and REU participant

July 2018

## 1 Introduction

This project is to collect data, such as images and videos, that can represent the blind community. The existing datasets currently do not represent this specific population as they are collected by sighted people. During our frequent research talk meetings, we discussed project design and data collection methods.

## 2 Related Works

### 2.1 Data and deep learning

ImageNet [3]

Big data deep learning: challenges and perspectives [2]

## 3 Insights

### 3.1 About blind population

In the blind community, 5% is the completely blind

Visually impaired vs. completely blind

## 4 TO Do List

Documentation of process (camera)

Variable tree for environment

Initial study with Ebrima, Dan, and Kyungjun

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## 5 Methods

### 5.1 Categories

In the paper of Erin Brady, et al. [1] (VizWiz 1).

Food/Drink (28%)

Computer/TV (8%)

Clothing (8%)

Household (7%)

Entertainment (6%)

Paper (6%)

Bathroom (6%)

Misc. objects (12%)

In the GLASSENSE-VISION dataset 2, there are three different geometrical

types;

at objects, boxes - parallelepiped objects, cylindrical objects.

Flat: Banknotes

Boxes: Cereals, Medicines

Cylinders: Cans, Tomato sauces, Water bottle, Deodorant stick

6 Variables @ the Moment

Data type: image / video

Perspective: Hand-held smart phone / Go Pro; Chest-mounted smart phone/ Go Pro; Portrait / Landscape; Angle

Background: Object colors, Texture, Other object (Color/Shape);

Hands: Skin color, Nail polish(Color/shape), Position, Poses, Accessories,

Numbers of

ngers

Lights: Day/Night, Rectifying, Indoor lighting (Color, brightness, position), Shadow

Object: Location, Shape, Color, Label, Angle, Material

1 <http://vizwiz.org/data/#dataset>

2 [http://www.sligguru.unige.it/Data/glassense\\_vision/](http://www.sligguru.unige.it/Data/glassense_vision/)

2

### 6.1 Object Categories

Kitchen: Boxes, Cans (Food, Drink), Snacks, Species, Package (Sugar, rice, baking powder), Liquid Soap

Bed room: Medicine, Clothes (Socks, Ties), Shoes, Hats / Caps, Bags, Bedding (Sheets, Blankets, Pillows), Skin cares, Makeups, Floor mats,

Bathroom: Liquid items (Mouthwash, Shower gel, Shampoo, Conditional); Solid items (Tooth paste, Skin Cares); Towel; Cleaning items.

Living room: Switches (Location, shape, color), Options for appliances (Chargers, remote controller, plastics / aluminum / steel), iron

Cable color (+ / -), cable plug-in type, Batteries (chargeable or not)

### 6.2 Environmental variables

Figure 1: Initial brainstorming about environmental variables

Figure 1 shows the output of our initial brainstorming on the environmental variables for the data collection. Following is the list of variables for the data collection.

Data type: Images/Videos

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Perspective: hand-held smartphone, chest-mounted smartphone/GoPro6, head-mounted GoPro6, portrait/landscape, angle

Background: different colors/textures, with other (background) objects |

similar/different color/shape, with/without hands | including different

colors, shapes, positions, and poses

Light: day/night, indoor lighting, with/without shadow

Object: location, shape, color, label, angle, texture/material

Object-environment relation: the background of some objects may have

certain characteristics; e.g.) kitchen stool, bathroom stool, clothes

6.3 Dan's variables tree

Temperature:

In winter and summer, foods in room temperature rot at different speeds.

In winter some foods can last longer than in summer. If the Apps can still recognize them accurately. For example, in room temperature, a banana will be in a different condition after 5 days in winter than in summer. Many fruits and vegetables are like this. Some other leftover if not put in refrigerator, are they still eatable?

Air pressure:

Low-pressure areas will have different angles from high pressure areas.

In low-pressure area, such as plain area, certain bag packages will compress.

However, in high pressure areas, such as plateau area, some bag packages will swell.

Light:

Day/Night, Reflecting,

Indoor lighting (Color, brightness, position), Shadow

Humidity:

Humidity can cause food change in shapes or quality.

For instance, a bag of bread, if not properly stored, if the room humidity is very low, it will make the bread or cake dry.

By the same token, in bathroom, the the humidity is very high, there will be easily get mold on the wall, with means it will change the room background.

Water Vapour / Fog :

If there is water vapour, or fog, the recognized may not be able to recognize objectives.

#### 6.4 Procedure

Location: Intelligent Assistive Machines (IAM) Lab, Human -Computer Interactions Lab (HCIL)

Data: Images (using screen recording)

Device: Lab's iPhone 8

Objects

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{ Kitchen: hand soap, dish detergent, hand sanitizer

{ Kitchen: soda cans, can milk, can food

{ Kitchen: Snacks

{ Kitchen: Species

{ Kitchen: Cereals

{ Room: medicines

{ Room: skin cares (hand lotion, body lotion, sunscreen, facial lotion)

{ Room: socks (color)

##### 6.4.1 Objects

Cylinder: hand/facial wet tissue vs. cleaning wipes (computer/cleaning)

Boxes: tea boxes (green tea, herbal tea, black tea, coffee), medicines

hand lotion, facial lotion, sunblock

##### 6.4.2 Environmental variables

location in the lab

curtain on/o

time (sunlight), weather

hands (left/right, color, pose, positions)

landscape/portrait

background (objects, color, texture)

## References

- [1] Erin Brady, Meredith Ringel Morris, Yu Zhong, Samuel White, and Jeremy P Bigham. Visual challenges in the everyday lives of blind people. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pages 2117-2126. ACM, 2013.
- [2] Xue-Wen Chen and Xiaotong Lin. Big data deep learning: challenges and perspectives. IEEE access, 2:514-525, 2014.
- [3] Jia Deng, Wei Dong, Richard Socher, Li-Jia Li, Kai Li, and Li Fei-Fei. Imagenet: A large-scale hierarchical image database. In Computer Vision and Pattern Recognition, 2009. CVPR 2009. IEEE Conference on, pages 248-255. Ieee, 2009.

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Week5: Monday - Friday July 9 - 13, 2018

Monday July 9,

Had a research talk meeting with Kyungjun and Dan

discussion includes data collection techniques, training and testing, variable type and the environment.

Kyungjun introduced the digital camera and iPhone 8 for the project



scheduled a Tuesday research talk meeting for July 17, 2018

Thursday July 12, had a research talk meeting with the Data Collection crew (Kyungjun, Dan, June and Ebrima)+ team adviser, Dr. Hernisha Kacorri through Skype

discussion includes and are not limited to:

The project prototype (design of data collection)

variables (objects to be collected, trained and tested

environment

techniques of data collection

Did a rigorous model training of 19 objects The first phase does not include the blind photographer's hand in the Data collection process

Had the iPhone 8 in the Portrait Mode and Onscreen snap for all 19 objects

The four modes in the data collection are

Portrait and Onscreen for 19 objects with minimum of about 35 snapshots Portrait

and Volume button for 19 objects with minimum of about 35 snapshots Landscape

and Onscreen for 19 objects with minimum of about 35 snapshots Landscape and

Volume button for 19 objects with minimum of about 35 snapshots

Had an object on the desk and with the iPhone 8, take a snapshot of the item in all possible ways at least 30 times

Average snapshot of all model training is about 35

Average snapshot of testing for each object (19 objects) is about 6

In the testing phase, each object is randomly selected and a snapshot of the random object is taken five times

The project is still in progress; the first phase of the initial Data collections for training and testing are completed. We are still working on the second phase of the project and as my ten week REU program approaches the end, Dr. Kacorri, mentor and project supervisor and Kyungjun Lee, mentor and Ph.D. student will continue to work on the project and eventually, come up with a result(s), findings and algorithms.

My frustrations includes and are not limited to accessibility issues, difficulties holding the iPhone 8 on one hand and the object on the other hand and take a snapshot of the object, miscounting of the number of snapshots taken, missing the object in the snapshot

and difficulties pressing the Take Picture on the screen, Portrait style, Take Picture using Volume button Portrait style, Take a Picture onscreen Landscape style and Take a Picture volume button Landscape style. These processes are repeated many times. Took several thousand photographs of nineteen objects for a minimum of about thirty-five snapshots.

Edited and updated personal web page

Edited progress report using LaTeX

Week6: Monday - Friday July 16 - 20, 2018

DREU Submitted Milestone Requirements

2nd Milestone Requirements

Mentor Name: Dr. Hernisha Kacorri

School/Dept: College of Information Studies (iSchool), University of Maryland, College Park, MD

Research Area: Accessibility

Personal URL: <https://terpconnect.umd.edu/~ebjarjue/>

## MENTORSHIP

project & goals:

The purpose of the project is to assist the blind and visually-impaired individuals in their homes. There have been multiple studies that show that there are many benefits of the blind and visually-impaired living in their own homes rather than assisted living facilities. The purpose of the personal object recognizer is to help blind and visually-impaired people identify objects around them at home. The objects includes and are not limited to kitchen items such as packages of food, bedroom items of clothing to items in the bathroom. We explore personal object recognizers, where I, as a blind and DREU participant train a mobile application with a few snapshots of objects of interest and provide custom

labels. The object recognizer app can assist with daily functions such as object recognition of household items and more. It is completely voice controlled, which enables the blind and visually-impaired individuals to now bridge the gap between technology and the community.

### 3rd Milestone Requirements

#### Brief description of project

##### Project: Data collection for Personal Object Recognition

The purpose of the personal object recognizer is to help blind and visually-impaired people identify objects around them mostly at home. The objects includes and are not limited to kitchen items such as packages of food, bedroom items of clothing to items in the bathroom. We explore personal object recognizers, where I, as a blind participant train a mobile application with a few snapshots of objects of interest and provide custom labels.

#### Status of project, accomplishment and expectation in the rest of the summer

The Project is in progress as expected. Completed the phase 1 (training of model) and phase 2 (testing model)).

#### Project Team

Dr. Hernisha Kacorri, Professor and mentor

Kyungjun Lee, Ph,D student and mentor, Dan, graduate student and Ebrima Jarjue, Undergraduate student conducted an initial data collection Monday July 23, 2018 with some of the objects in our lab — tea box, cleaning wipe, and windex — after designing the study procedure for our data collection.

Based on Ebrima's feedback, we decided to utilize the following objects for our data collection:

- Kitchen environment
  - o Liquid-soap bottle: hand soap, dish detergent (and hand sanitizer)
  - o Cans: soda cans, can food, can soup or can milk
  - o Snacks

- o Spices
- o Cereals
- Room environment
- o medicines
- o Skin cares: hand lotion, body lotion, facial lotion, sunscreen
- o Socks

we selected the objects that are small enough to be included with a hand (or hands) in the camera frame.

We expect to accomplish a model trained on photos by blind participants where a trained mobile application with a snapshot of object of interest can provide custom labels.

The biggest challenge

learning html to build a webpage was challenging and require constant editing and updating

Learning LaTeX to write reports. These two languages were a challenge but, now I have a hang of it and able to work around to solve my problems.

The project is still in progress; the first phase of the initial Data collections for training and testing are completed. We are still working on the second phase of the project and as my ten week REU program approaches the end, Dr. Kacorri, mentor and project supervisor and Kyungjun Lee, mentor and Ph.D. student will continue to work on the project and eventually, come up with a result(s), findings and algorithms.

My frustrations includes and are not limited to accessibility issues, difficulties holding the iPhone 8 on one hand and the object on the other hand and take a snapshot of the object, miscounting of the number of snapshots taken, missing the object in the snapshot

and difficulties pressing the Take Picture on the screen, Portrait style, Take Picture using Volume button Portrait style, Take a Picture onscreen Landscape style and Take a Picture volume button Landscape style. These processes are repeated many times. Took several thousand photographs of nineteen objects for a minimum of about thirty-five snapshots.

The most exciting thing

Learning html and L<sup>A</sup>T<sub>E</sub>X basics

Launching personal webpage and editing the page as I progress.

Participating in the data collection prototype and design for Personal Object Recognition

The believe that I, as a blind student and a DREU participant is contributing in the data collection process that will hopefully and eventually, help the blind and visually-impaired people become independent.

Working environment/ how frequently do you meet your mentor, the grad students in your group, others in the department, etc? Are you working on your project alone, with another undergrad, or with a graduate student. Have you attended any research talks?

My Working environment is in a shared lab (Intelligent Assistive Machines-IAM) data collection team at University Of Maryland, College Park. I am granted access to the lab with a physical key and access code through student ID

I frequently meet my mentor and the grad students in my group. We have had many research talks to enable me understand the project.

I go to the lab Monday through Friday and on average from 7am – 8pm.

Housing and roommate situation

Housing and roommate situation has become a problem and a distraction at school. I live in an expensive area with easy access to public transportation and close to down town Silver Spring. A two bed-room apartment with a bathroom goes for about \$1700 or more a month. Roommates come and go because the place is not cheap or affordable.

As a full time student, a father of three kids and a social security recipient of \$952 per month, this is not enough to maintain an apartment.

Number of weeks worked

Worked 6 weeks : Monday, June 11, – Friday, July 27, 2018

Other comments. Is there anything else that you would like us to know about your experience?

Comments to Mentor Is there anything you would like to tell your mentor (these comments, if any, will be forwarded to your mentor)?

Helpful, considerate, and accommodating.

Monday July 16,

Submitted 3rd milestone requirements progress report

Did a rigorous model training of 19 objects The first phase does not include the blind photographer's hand in the Data collection process

Had the iPhone 8 in the Portrait Mode and Onscreen snap for all 19 objects

The four modes in the data collection are

Portrait and Onscreen for 19 objects with minimum of about 35 snapshots Portrait and Volume button for 19 objects with minimum of about 35 snapshots Landscape and Onscreen for 19 objects with minimum of about 35 snapshots Landscape and Volume button for 19 objects with minimum of about 35 snapshots

Had an object on the desk and with the iPhone 8, take a snapshot of the item in all possible ways at least 30 times

Average snapshot of all model training is about 35

Average snapshot of testing for each object (19 objects) is about 6

In the testing phase, each object is randomly selected and a snapshot of the random object is taken five times

The project is still in progress; the first phase of the initial Data collections for training and testing are completed. We are still working on the second phase of the project and as my ten week REU program approaches the end, Dr. Kacorri, mentor and project supervisor and Kyungjun Lee, mentor and Ph.D. student will continue to work on the project and eventually, come up with a result(s), findings and algorithms.

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and difficulties pressing the Take Picture on the screen, Portrait style, Take Picture using Volume button Portrait style, Take a Picture onscreen Landscape style and Take a Picture volume button Landscape style. These processes are repeated many times. Took several thousand photographs of nineteen objects for a minimum of about thirty-five snapshots.

Week 7: Monday July 23 - Friday July 27, 2018

Monday July 23, 2018

Kyungjun Lee, Ph,D student and mentor, Dan Yang, graduate student and collaborator and Ebrima Jarjue, Undergraduate student and DREU participant, conducted phase 1, an initial data collection and training of the Personal Object Recognizer with some of the objects in our lab — tea box, cleaning wipe, and windex — after designing the study procedure for our data collection.

Object training and testing: Lab environment

The Objects training and testing of the kitchen items are held in the lab environment.

Liquid-soap bottle: hand soap, dish detergent (and hand sanitizer)

Cans: soda cans, can food, can soup or can milk

Snacks

Spicies

Cereals

Room environment

medicines

Skin cares: hand lotion, body lotion, facial lotion, sunscreen

we selected the objects that are small enough to be included with a hand (or hands) in the camera frame.

Did a rigorous model training of 19 objects The first phase does not include the blind photographer's hand in the Data collection process

Had the iPhone 8 in the Portrait Mode and Onscreen snap for all 19 objects

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Week 8: Monday July 30 - Friday August 3, 2018

Did a rigorous model training of 19 objects The first phase does not include the blind photographer's hand in the Data collection process

Had the iPhone 8 in the Portrait Mode and Onscreen snap for all 19 objects

The four modes in the data collection are

Portrait and Onscreen for 19 objects with minimum of about 35 snapshots Portrait and Volume button for 19 objects with minimum of about 35 snapshots Landscape and Onscreen for 19 objects with minimum of about 35 snapshots Landscape and Volume button for 19 objects with minimum of about 35 snapshots

Had an object on the desk and with the iPhone 8, take a snapshot of the item in all possible ways at least 30 times

Average snapshot of all model training is about 35

Average snapshot of testing for each object (19 objects) is about 6

In the testing phase, each object is randomly selected and a snapshot of the random object is taken five times

Completed the training phase

The project is still in progress; the first phase of the initial Data collections for training and testing are completed. We are still working on the second phase of the project and as my ten week REU program approaches the end, Dr. Kacorri, mentor and project supervisor and Kyungjun Lee, mentor and Ph.D. student will continue to work on the project and eventually, come up with a result(s), findings and algorithms.

My frustrations includes and are not limited to accessibility issues, difficulties holding the iPhone 8 on one hand and the object on the other hand and take a snapshot of the object, miscounting of the number of snapshots taken, missing the object in the snapshot

and difficulties pressing the Take Picture on the screen, Portrait style, Take Picture using Volume button Portrait style, Take a Picture onscreen Landscape style and Take a Picture volume button Landscape style. These processes are repeated many times. Took several thousand photographs of nineteen objects for a minimum of about thirty-five snapshots.

Week 9: Monday August 6 - Friday August 10, 2018

Did a rigorous model training of 19 objects this time with my hand included in the Data collection process

Had the iPhone 8 in the Portrait Mode and Onscreen snap for all 19 objects

The four modes in the data collection are

Portrait and Onscreen Portrait  
and Volume button Landscape  
and Onscreen Landscape and  
Volume button

Had an object in one hand (left hand) and the iPhone 8 on the right hand, and take a snapshot of the item in all possible ways at least 30 times

Average snapshot of all model training is about 35

Average snapshot of testing for each object (19 objects) is about 6

In the training phase, each object is place in order and a snapshot of 19 objects for a minimum of 35 snapshot for each

In the testing phase, each object is randomly selected and a snapshot of the ramdom object is taken five times

Received an email from Kayla Brown, asking if I would be interested to write a REU experience summary for Access Computing press publication

I drafted a summary experience

Friday August 10, 2018

Sent drafted REU experience summary to Dr. Kacorri, for comments and input

Worked on the REU experience summary

See the finished and submitted REU Experience summary for Newsletter publication below:

Date: Thursday August 9, 2018

### REU Experience Summary

I am blind, a father of three daughters, a non-traditional student and a senior at University of Maryland, College Park majoring in Information Science at the UMD iSchool; hoping to specialize in Human-Computer Interaction in graduate studies. I value education not only in the practical sense (degrees and employment) but also for how it shapes me as a person and allows me to contribute to our society. Given my interest in computing, I took several Computer Science classes in parallel to my course work in Information Studies. The knowledge I gained from these classes has helped my contribution to my community by providing assistance to other visually impaired friends and fellow students interact with technology. I began to think that computing may be a subject worth investing my life in. I believe I am indebted to our society in various ways and I want to make contributions in the "Jesuit tradition for the glory of God and the well-being of humankind". Studying computing might pave the way this goal.

This summer, I participated in the Distributed Research Experiences for Undergraduates (DREU) program, a summer internship program supporting female and underrepresented students. I found out about this opportunity from Dr. Hernisa Kacorri, an Assistant Professor at UMD. I was introduced to her a couple semester ago by one of my instructors, Dr. Bonsignore. I was interested in her research on Accessibility and wanted to work with her over the summer. After expressing my interest, she invited me to join her research lab, the Intelligent Assistive Machines Lab, and she directed me to AccessComputing. And this is where my journey with Access Computing started.

When given an opportunity for REU this summer, I chose to stay here at the UMD iSchool and work with Dr. Kacorri as my mentor. My project is very close to my heart as it allows me to contribute to novel assistive technologies that can improve the lives of people with visual impairments. Moreso, it was a fun project that gave me the opportunity to interact with graduate student and get a pick at what research is. Specifically, in this project I collaborated with Kyungjun Lee, a CS PhD student who provided advisement and mentorship, Dan Yang, an incoming HCI graduate student, as well as June Xu, an impressive hard-working freshmen in Computer Engineering.

My task involved helping with the design and implementation of the data collection process that will serve as a benchmark for our machine learning algorithms. This involved engineering the stimuli and all possible variable for photo taking of everyday objects by blind users. I contributed to the first dataset that is currently replicated by other sighted and blind users as well. This dataset plays an important role in the project as it will be used to train and test computer vision models to be incorporated in a

wearable or mobile device as a teachable objection application for blind users. Specifically, blind participants will be training the mobile application with snapshots of object of interest and can provide custom labels as well as object descriptions through audio.

Prior studies that show that there are many benefits for people who are blind and visually impaired living in their own homes rather than assisted living facilities. We are hoping that the assistive technologies from this project will help in this direction. Currently, the project is considering objects that include and are not limited to kitchen items such as packages of food, bedroom items such as clothing, as well as everyday items in the bathroom. During this summer, we explored teachable object recognizers, where I, as a blind and REU participant trained a mobile application with a few snapshots of objects of interest (that we chose to serve as stimuli) under different conditions (hand in the scene, lighting, background noise, camera position, camera mode, etc.).

I had an awesome experience working as a team member of such a diverse group. Working with graduate students and hearing their stories post-undergrad was very rewarding and eye-opening. It was also a great networking experience as I attended research talks and got to discuss with research visitors about their work. Specifically, I would like to thank my advisor, Dr. Kacorri for inviting and setting up a meeting at the beginning of my internship with Ali Abdolrahmani, a PhD student at University of Maryland, Baltimore County. Ali was the first blind PhD student that I have met. Not only were our discussion fruitful but also through him I got introduced to an entire network of blind researchers. Honestly, I had an excellent time working at the IAM Lab through this DREU program. I owe this to many people but more so to AccessComputing. This alliance has helped me in so many ways, and I would recommend any fellow student who is blind or visually impaired to join them. Of course, there were challenges. This is the first year that the CRA-W opened the application process for students with disabilities and there is more to be done there to make the process and their interfaces more accessible. Also, finding a reader or scribe right before the summer is hard. Student tend to go away for summer vacations or internships. So, I would recommend that one starts this search early on. The most important lesson I have learned this summer is that a slow start does not mean a productive end. Being able to do what I love for an entire summer has been a priceless experience. Through this program, I learned technical skills such as programming in HTML and LaTeX as well as analytical thinking, reading scholarly articles, and experimental design processes.

The DREU internship program has helped me accomplish my goals in gaining research experience and pursuing research opportunities for future graduate studies. And why stop at a Master's degree? Initiatives like AccessComputing empower students like me to dream further and leverage their life experiences to make a better world. Hopefully, next time you hear from me, I am a PhD student. And that's a new dream!

Ebrima Jarjue  
DREU 2018 Participant  
College of Information Studies (Maryland's iSchool)  
University of Maryland, College Park



Week 10: Monday August 13 - Friday August 17, 2018

Monday August 13, Edited REU Experience Summary for REU Newsletter publication

Submitted the Summary to Kayla Brown

Did a rigorous model training of 19 objects this time with my hand included in the Data collection process

Had the iPhone 8 in the Portrait Mode and Onscreen snap for all 19 objects

The four modes in the data collection are

Portrait and Onscreen Portrait

and Volume button Landscape

and Onscreen Landscape and

Volume button

Had an object in one hand (left hand) and the iPhone 8 on the right hand, and take a snapshot of the item in all possible ways at least 30 times

Average snapshot of all model training is about 35

Average snapshot of testing for each object (19 objects) is about 6

In the testing phase, each object is randomly selected and a snapshot of the random object is taken five times

Tuesday August 14,

Completed the training phase

Edited journal/weekly diary for update

Received 4th milestone requirements reminder from Nancy

Wednesday August 15, 2018

Edited progress report for final submission

Final day for colleague: June Xu, Freshman and Computer Engineering major

1:30pm – A presentation meeting for all Intelligent Assistive Machines (IAM) team

Mayamka, Dan, Ebrima, Kyungjun, June and Dr. Kacorri, Professor and project supervisor and leader giving comments during presentation

Finalizing progress report

Thursday August 16

Edited and updated webpage

Edited DREU experience summary with Dr. Hernisa Kacorri

Reviewed and edited Weekly Journal using LaTeX

Friday August 17

Completed and submitted the final DREU experience summary with photos taken during the DREU Summer 2018 internship program in the HCIL's Intelligent Assistive Machines (IAM) lab

Submitted the final DREU experience summary to Kayla Brown and received acknowledgement

We (Ebrima and Dan) collected data in the kitchen in HCIL; in the conference room

the data collection:

1. Took all of the items and go to the HCIL kitchen
2. Place the items where we thought it would be appropriate; e.g., hand sanitizer and hand soap should be around the sink
3. Once done placing the items, Dan guided me to reach each item at a time In the training mode, the order of the objects to be train does not matter
4. Dan turned on the screen recording
5. Dan then, told me what the 19 objects were, and I took 30 photos for each of the 19 objects for training
6. Once I finished taking the photos, Dan turned off the screen recording and to reset the screen recorder
7. Go to a next item (again the order does not matter) – repeated the process for the 19 objects randomly throughout
8. Keep doing 1. ~ 7. steps until I took photos of all the items for training

Note that we keep the order of the camera setting like before: portrait + screen button -> portrait + volume button -> landscape + screen button -> landscape + volume button. When following the above instructions, please keep the camera setting; that is, I took photos of all the items using one camera setting. Switch to the next camera setting once I finished taking the photos of all the items.

Week 11: Monday August 20, thru Friday August 25, 2018

Data collection with/without Ebrima's hand in the photos and in the kitchen environment with the lights on.

These applies to all during training and testing

We (Ebrima and Dan) collected data in the kitchen in HCIL; in the conference room

the data collection:

1. Took all of the items and go to the HCIL kitchen
2. Place the items where we thought it would be appropriate; e.g., hand sanitizer and hand soap should be around the sink
3. Once done placing the items, Dan guided me to reach each item at a time In the training mode, the order of the objects to be train does not matter
4. Dan turned on the screen recording
5. Dan then, told me what the 19 objects were, and I took 30 photos for each of the 19 objects for training
6. Once I finished taking the photos, Dan turned off the screen recording and to reset the screen recorder
7. Go to a next item (again the order does not matter) – repeated the process for the 19 objects randomly throughout
8. Keep doing 1. ~ 7. steps until I took photos of all the items for training

Note that we keep the order of the camera setting like before: portrait + screen button -> portrait + volume button -> landscape + screen button -> landscape + volume button. When following the above instructions, please keep the camera setting; that is, I took photos of all the items using one camera setting. Switch to the next camera setting once I finished taking the photos of all the items.

Wednesday August 22

Data collection with/without Ebrima's hand in the photos

Kitchen environment with the lights on

We (Ebrima and Dan) scolleced data in the kitchen in HCIL; in the conference room

the data collection:

1. Took all of the items and go to the HCIL kitchen
2. Place the items where we thought it would be appropriate; e.g., hand sanitizer and hand soap should be around the sink
3. Once done placing the items, Dan guided me to reach each item at a time In the training mode, the order of the objects to be train does not matter
4. Dan turned on the screen recording



5. Dan then, told me what the 19 objects were, and I took 30 photos for each of the 19 objects for training
6. Once I finished taking the photos, Dan turned off the screen recording and to reset the screen recorder
7. Go to a next item (again the order does not matter) – repeated the process for the 19 objects randomly throughout
8. Keep doing 1. ~ 7. steps until I took photos of all the items for training

Note that we keep the order of the camera setting like before: portrait + screen button -> portrait + volume button -> landscape + screen button -> landscape + volume button. When following the above instructions, please keep the camera setting; that is, I took photos of all the items using one camera setting. Switch to the next camera setting once I finished taking the photos of all the items.

Thursday August 23,

Data collection with/without blind participant's hand

Kitchen environment with lights on

We (Ebrima Jarjue, blind and DREU participant and DanYang, collaborator) collected data in the kitchen environment, in HCIL; in the conference room

the data collection:

1. Took all of the items and place them randomly in the HCIL kitchen
2. Place the items where we thought it would be appropriate; e.g., hand sanitizer and hand soap should be around the sink
3. Once done placing the items, Dan guided me to reach each item at a time In the training mode, the order of the objects to be train does not matter
4. Dan turned on the screen recording
5. Dan then, told me what the 19 objects were, and I took 30 photos for each of the 19 objects for training
6. Once I finished taking the photos, Dan turned off the screen recording and to reset the screen recorder

7. Go to a next item (again the order does not matter) – repeated the process for the 19 objects randomly throughout
8. Keep doing 1. ~ 7. steps until I took photos of all the items for training

Note that we keep the order of the camera setting like before: portrait + screen button -> portrait + volume button -> landscape + screen button -> landscape + volume button. When following the above instructions, please keep the camera setting; that is, I took photos of all the items using one camera setting. Switch to the next camera setting once I finished taking the photos of all the items.

During the training and testing, I either touch or hold the objects with my hand while taking a snapshot of the object with other hand.

Did this process for all the training and testing.

Friday August 24,