

# Fall 2017 C-day Winners

## Category: Capstone

1st place: CPSWE-30 Microservice Architecture & DevOps

by Erik Knudsen, Laura Johnson, Nate Pattharakositkul, Rony Campos, Shahnawaz Bhimani  
Major: MSSWE Advisor: Dr. Hassan Pournaghshband

2nd place: CPCS-15 AI and Chess Variant

by Mitchell Weiss, Josh Cooper, Tony Khounxay, Theossie Mundy, Sean Kennedy, Tyler  
Crawley  
Major: BSCS Advisor: Dr. Kenneth Hoganson

3rd place: CPCS-11 Fortran/Java Cross-Compiler

by Wes Groover, Elizabeth McDonald, John Monson, Nelson Tskau, Heath Worrell  
Major: BSCS Advisor: Dr. Kenneth Hoganson

## Category: Games

1st place: GM-07 Cop E. Wright: A Capstone Game

by Henrique Lima, Marcus Ford  
Major: BSCGDD Advisor: Dr. Allan Fowler

2nd place: GM-06 Cyber

by Garrett Eddy  
Major: BSCGDD Advisor: Dr. Allan Fowler

3rd place: GM-04 Little Wars

by Brandon Macauley, Brennan Sanford, Aarth Thakore, John Ellis  
Major: BSCGDD Advisor: Dr. Allan Fowler

## Category: Graduate Research

1st place: GRCS-23 Creating Artificial Cognition

by Oscar Garcia  
Major: MSCS Advisor: Dr. Selena He

2nd place: GRCS-27 Secure protocol in Power Grids

by Uday Bhaskar Boyanapalli  
Major: MSCS Advisor: Dr. Donghyun Kim

3rd place: GRCS-30 Predict and Prevent College Dropout

by Nelson Zange TSAKU

Major: MSCS Advisor: Dr. Mingon Kang

### **Category: Faculty Award Undergraduate Research and High School Internships**

1st place: URIT-15 Performance Analysis of Brain Control Interface in Drone Applications  
by Adnan Rashied, Jason Walters, Cheyenne Sancho, Josh Cooper, Ahmad Alissa, Eric Rawls,  
Kade Randall, Heather Rego

Major: BSCS Advisor: Dr. Sarah North

2nd place: URSWE-17 Guidelines to avoid analyst mistakes  
by Ruth Petit - Bois

Major: BSSWE Advisor: Dr. Paola Spoletini

3rd place: URCS-10 Alternative Weighted Fuzzy C Means  
by Michael Wong, Eric Tran

Major: BSCS Advisor: Dr. Chih-Cheng Hung

### **Category: Industry Award Undergraduate Research and High School Internships**

1st place: URIT-16 Food For Thought  
by Mizzani Walker-Holmes, Jihwan Oh, Miriam Chapellka, Dorris Scott  
Major: BSIT Advisor: Dr. Carl DiSalvo

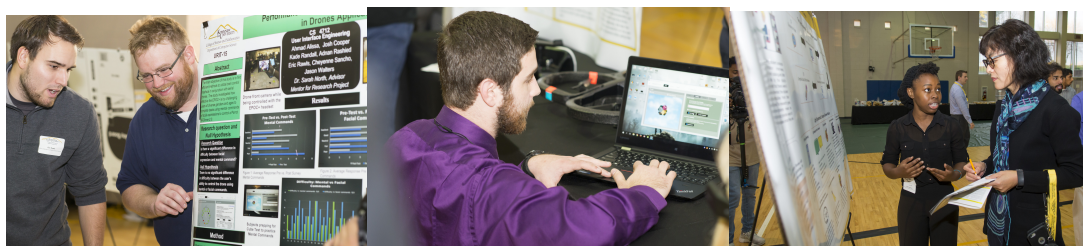
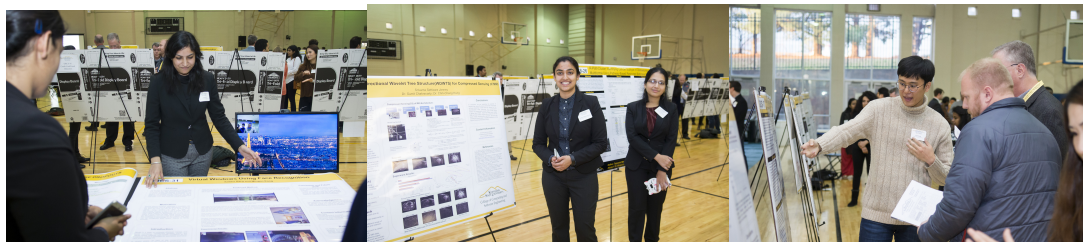
2nd place: URCS-11 Automated Macro Malware Detection  
by Ruth Bearden

Major: BSCS Advisor: Dr. Dan Lo

3rd place: URCS-13 VR Locomotion and its Effects

by Mark Chamberlain, Alex Kimbell, William Dingler, Vojtech Martinek, Ryan Drumm, Troy Wu

Major: BSCS Advisor: Dr. Sarah North





## Contact Info

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**kennesaw.edu/info**

**Media Resources**

**Marietta Campus**  
 1100 South Marietta Pkwy  
 Marietta, GA 30060

**Campus Maps**

## Resources For

Current Students

Online Only Students

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## Related Links

Libraries

Housing

Financial Aid

Degrees, Majors & Programs

Registrar

Job Opportunities

Campus Security

Global Education

Diverse & Inclusive Excellence

Sustainability

Accessibility



# Fall 2017 C-Day Program

## Thursday, November 30, 2017

**Location:** Marietta Campus - Recreation Center S1 (not Gym)



**C-Day Home Page**

**Return to the C-Day home page.**



**Fall 2017 Winners**

**View the Fall 2017 C-Day winners.**



**Flash Session Presentation**

**Download the C-Day Flash Session Presentation.**

TIME	EVENT
4:00 pm - 4:30 pm	Student check-in time followed by set-up (presenters only)
4:30 pm - 5:00 pm	Check-in judges, industry partners, Networking
5:00 pm - 5:35 pm	Welcome from Dean Preston followed by Flash Session
5:35 pm - 6:20 pm	Judging of Student Posters and Games Browsing
6:20 pm - 6:40 pm	Refreshments and Networking
6:40 pm - 6:45 pm	Introduction of Keynote Speaker (Dean Preston)

6:45 pm - 7:00 pm

Keynote Speaker: Wade Smith,  
Technology Manager, State Farm

7:00 pm - 7:10 pm

Recognition of Judges

7:10 pm - 7:40 pm

Presentation of Awards

- Best Game
- Best Capstone Project
- Best Undergraduate Research Project
- Best Graduate Research Project

**Gigabyte Sponsor**  **State Farm®**

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## Judges

### Games

- Joe Cassavaugh - Puzzles By Joe
- Andrew Greenberg - Executive Director, GGDA/HDI [www.ggda.org](http://www.ggda.org)
- Whitney Weaver - CTO, mLevel
- Diz / Disney Nguyen - Game Developer, Tripwire Interactive KSU/SPSU CGDD Alumni
- Mike Stone - Producer, Tripwire Interactive
- Shaun Sheppard - Lead Game/Software Developer, Motion Reality, Inc.

### Capstone Projects

- Jim Keener - CTO , Ingenious Med
- Mike Phillips - Director, Global Talent Acquisition , InComm
- Scott Bradshaw - Application Lead, Georgia Pacific

### Undergraduate Research Projects

- Andrew Hamilton - Chief Technology Officer, Cybriant
- Tommie Mack - Director IS Services, Shaw Industries
- Evanda Remington - Director of R&D, Manhattan Associates

### Graduate Research Projects

- Tim Alman - Manager of IT Service Management, Aaron's, Inc
- Bruce Skillin - Technology Innovator, Georgia-Pacific
- Roger N. Mahler - AT&T Public Sector/AT&T IoT Solutions, AT&T
- Trevor Sands - Sr. Systems Developer, Shaw Industries

- Jose Garrido, Ph.D. - Professor of Computer Science & Information Systems, KSU
- Chao Mei, Ph.D. - Assistant Professor of Software Engineering and Game Design and Development, KSU

## Rubrics

Capstone/ Undergraduate/Graduate Research scale 0 - 10 with 0 representing "Poor" and 10 representation "Exceeds Expectations"

- Successfully completed stated project goals and reported deliverables (0-10)
- Methodology/Approach: All required elements are clearly visible, organized, and articulated (0-10)
- Effective verbal presentation (0-10)

Games scale 0 - 10 with 0 representing "Poor" and 10 representation "Awesome"

- TECHNICAL: Technically sound with appropriate visual & audio fidelity(0-10)
- GAMEPLAY: Engaging & Fun, with an intuitive UI. Rules of play are clear. Includes a win/lose state(0-10)
- ORIGINALITY: Sound, Art, Design, or Code(0-10)

## Capstone Projects (30)

### \* Candidates for the best capstone project award

- **CPCS-01 Railspect**  
by Cody Paul, Khoa Pham, Zenga Siwingwa, Jimmy Nguyen, Justin Rose  
Major: BSCS Advisor: Dr. Edward Jung  
Our project is a mobile-based application designed to replace Railserve Inc.'s current track inspection process. will allow Railserve track inspectors to easily document defects, capture images and accurately record the location of defects during their inspection, and then generate a final report summarizing all of the defects found upon the completion of the inspection. The benefits include a faster and standardized workflow for track inspectors and improved communication between the inspectors and management.
- **CPCS-02 DocAudit**  
by Robert Whitaker, Roshain Campbell, Chen Chen, Suraj Patel, Matt Simon  
Major: BSCS Advisor: Dr. Edward Jung  
Document Auditing solution for sponsor The Home Depot. THD will input form data as PDFs and the system will match new documents with the existing forms, and provide feedback into the integrity and completeness of the forms.
- **CPCS-03 BASICally Java**  
by Rushabh Shah, Zane Womack, John Lotspeich  
Major: BSCS Advisor: Dr Kenneth Hoganson  
Take in and compile a BASIC source code file into the equivalent structured Java source code. The two programs are equivalent from the user's



perspective at runtime.

- **CPCS-04 Home Depot Capstone Project**  
by Cori Beemish, Justin Faulkner, Tim Alcorn, Eric Roberson, Nick Perez  
Major: BSCS Advisor: Dr Kenneth Hoganson  
An application for Home Depot Audit Department that identifies several key features about each file in a database.
- **CPCS-05 RailServe Inspection**  
by Vodrie Cohen, Cameron White, Olyn Dabbs, Warren McClure, Kyle Mazlik, Christopher Owens  
Major: BSCS Advisor: Dr. Edward Jung  
Our solution allows inspectors to input inspection data, identify defects on a map, take pictures of the defects, then subsequently review them in an online portal. The solution consists of a tablet application, web service, cloud hosting, website, and data analytics.
- **\* CPCS-06 LexisNexis KSU**  
by Zach Gastley, Kierra Hicks, R.A. Keeling, Umar Rabanni, Kristina Larichev  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
An eLearning site that is dedicated the the teaching and thorough understanding of the LexisNexis core technologies, tools, and product offerings.
- **CPCS-07 Noonday Creek Trail App**  
by Kathelyn Zelaya, Mohammed Alkhurbush, Derek McCollum, Kyle Walker, Zach Pate  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
The intent of the app is to connect users to points of interest along the Noonday Creek Trail in the Kennesaw area and businesses in the Town Center area.
- **CPCS-08 TripTop Itinerary Management**  
by Michael Bourgault, Teddy Mopewou, Karl Kevin Tiba  
Major: BSCS Advisor: Dr.. Edward Jung  
It's a travel itinerary management website that has a social media touch to it with a forum where users can share their travel experiences. Creating and sharing itineraries has never been easier.
- **CPCS-09 FuzeThru Security and Automation**  
by Andrew Luebke, Jason Ricker, Travis Copeland, Wes Morton, Chris Lee  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
Modular and customizable home or office security and automation using Microsoft Azure cloud services and raspberry pi
- **CPCS-10 Rent 2 Go Apartment Management**  
by Andrew Owen, Nick Pound, Ross Taylor, Fabrice Bokanya, Guillermo Quintero, William Todd  
Major: BSCS Advisor: Dr. Edward Jung  
Rent 2 Go is an apartment management solution for small landlords. It is an all in one location for payment, messaging, managing tenants, work orders, and messages.

- **\* CPCS-11 Fortran/Java Cross-Compiler**  
by Wes Groover, Elizabeth McDonald, John Monson, Nelson Tskau, Heath Worrell  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
This project takes an error-free Fortran 90/95 source code file, and generates a functionally identical Java source code file that can be compiled and run.
- **CPCS-12 Rainway**  
by Evan Banyash, Rogelio Pineda, Ben Jibilian, Juan Roach  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
A video game streaming application. Allows users to play PC games remotely from any device with a web browser.
- **CPCS-13 Xanthan Smart Mirrors**  
by Josh Sexton, Juan Tenorio, Andrew Shatz, Craig Denney, Daniel Park, Deadric Sundby  
Major: BSCS Advisor: Dr. Jose Garrido  
A smart mirror utilizing facial authentication technology intended to simplify the user's every day routine.
- **\* CPCS-14 RailServe Track Inspection**  
by Mitchel Weaver, Ben Fitzgerald, Weyman Hall, William Eggers, Chris Hamlet, Gaelen Compton  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
An application for generating inspection reports for railroad inspections. This application will use Google Maps to specify location of inspections and defects. User will enter description and other information regarding defects and the app will then generate a corresponding form. This app is for RailServe, Ameritrack.
- **\* CPCS-15 AI and Chess Variant**  
by Mitchell Weiss, Josh Cooper, Tony Khounxay, Theossie Mundy, Sean Kennedy, Tyler Crawley  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
We are creating an alternative chess game that involves two actions per turn where you face off against an AI run by a greedy-minMax algorithm.
- **\* CPCS-16 Smart Parking**  
by Shahbaz Surani, Nilam Patel, Beenish Zafar, Michelle Becerra, Avani Shah  
Major: BSCS Advisor: Dr. Kenneth Hoganson  
Smart Parking, A project that aims to improve the parking efficiency of parking lots and parking decks. Smart Parking will have the capability of a better user engagement by allowing admins to manage their parking lots and parking spot for multiple locations. Admins will be able to create map of their parking lots. Using sensors throughout the parking facilities on parking spots the system will be able to track unused spots and display their location onto the web application to users. The goal is to improve the parking system efficiency and assists parking agents manage their workload better while improving the user experience of the customer. Smart Parking will serve the general public in parking facilities, both users and parking agents. Smart Parking operates in the following manner: Admins will create Parking Lot map. Users will see empty spot and its location in parking lot, on their smart phone. Users will



park on their parking spot.

- **CPIT-17 KSU MSIT Website enhancement**

by Priya Rathnam, Nacoda Stegall, Tamara Mayfield, Mihai Slujitoru

Major: BSIT Advisor: Dr Ming Yang

The project is about revamping the KSU MSIT website. The Project Owner has a specific requirement and vision for the new improved MSIT Website. The team is working towards achieving this goal through this project.

- **CPIT-18 ELSYS GTRI STEM AHEAD**

by Andrew Chew, Justin Borsh, Billy Cabrera, Jazz Davis Cooper, Belsay Diaz-Valera, Dexter Underwood

Major: BSIT Advisor: Dr. Ming Yang

Our task is to provide Georgia Tech Research Institute Electronic Systems Laboratory (ELSYS, for short) a thin client solution to help support various STEM promotion programs and training hosted by ELSYS. This program is used to allow High School students the ability to work with engineers from ELSYS on small scenarios type projects. The thin client must be able to host up to at least 30 students working on various things, some being solid works, AutoCAD, PCB Design work, and Arduino coding.

- **CPIT-19 Waterbird Application Design**

by Carl Peterson, Mikiba McCoy, Akirah Harika, Bailee Koury, Rachel Saylor

Major: BSIT Advisor: Dr. Ming Yang

Waterbird Application Design and Consulting Project for Plusoptix. Our goal is to provide our technical expertise in aiding in the design of the application and helping them create a software development structure they can effectively utilize to oversee that this project gets completed based on their needs when they go to an application development company.

- **CPIT-20 Plusoptix Capstone Project**

by Denzel Maxey, Jordan Hendrix, Endia Holmes, Morgan Draine, DeAngelous Brown

Major: BSIT Advisor: Dr. Ming Yang

End product needs the user to be able to access the screening data after we combine the data from the device spreadsheet and the newly created database. Even if simplistic, will likely need to be in an access (or similar) format.

- **\* CPIT-21 Security Solution for Healthcare**

by Polo Ortiz, Binta Dibba, Siobhan Smyth, Vriel Essome, Diamonte Thomas

Major: BSIT Advisor: Dr. Ming Yang

Security Solution Set for Healthcare Organizations. This project will explore security frameworks, standard healthcare architectures, risks, requirements & controls and develop a comprehensive solution set that could be used as a foundation to execute a plan for prevention, detection, and remediation.

- **CPIT-22 Hashtag Crafts**

by Annabelle Kelley

Major: BSIT Advisor: Dr. Ming Yang

E-commerce website for a small business, Hashtag Crafts. We built this website using wordpress.org as per the project owner's request.

- **CPIT-23 GTRI-CIPHER Citrix VDI Capstone**  
by Jake Kelley, Kaiten Kala  
Major: BSIT Advisor: Dr. Ming Yang  
GTRI-CIPHER is planning to modernize its aging Citrix Virtual Desktop Infrastructure (VDI). There are several new features and capabilities in Citrix XenApp and XenDesktop that our organization is interested in taking advantage of. This VDI infrastructure will allow us to virtualize our applications, linux, and windows desktops in our on-premise data center. Our users will ultimately have the ability to securely access GTRI-CIPHER IT resources from any network connected device; i.e. from their Macs, Linux or Windows workstations, cell phones, and/or their iPads and tablets.
- **CPIT-24 MSIT Data Warehouse**  
by Grant Nelson, Steve Dieuyou, Darnel Kamgain, Jack Savage  
Major: BSIT Advisor: Dr. Ming Yang  
An update, combine and ETL of three separate databases used by the MSIT program instructors to one database that is searchable across multiple entities for the purpose of data mining
- **\* CPIT-25 Deep Learning with the Jetson X2**  
by Steven Beyer, Arash Arzi, Chris Drayton, Peter Miles, Bradley Phillips, Ming Yang  
Major: BSIT Advisor: Dr. Ming Yang  
Deep Learning with the the Nvidia Jetson X2 for person and car recognition at significant distances from camera input with user detection.
- **CPIT-26 CCSE Openstack Data Center Upgrade**  
by Stephen Winn, Craig Wilson, Chris Davis, Katuel Clery, Michael Self, Michelle Mahan  
Major: BSIT Advisor: Dr. Ming Yang  
Upgrade of the current CCSE Openstack Installation to new hardware and migration of current projects to their new home.
- **CPSWE-27 HR Management Web App**  
by Zach Comstock, Lisian Ajroni, Benjamin Kaguwo, Ruth Petit - Bois, Eduardo Jean  
Major: BSSWE Advisor: Dr. Hassan Pournaghshband  
Web Application to manage common HR tasks, keep track of employee details, and manage employees' schedules.
- **\* CPSWE-28 HR Management System**  
by Denzel Harris, John Green, Brittany Meadows, Ronald Osei  
Major: BSSWE Advisor: Dr. Hassan Pournaghshband  
The project focuses on creating a way to track edit and view information regarding employees and their standing with the company. Most of the features are centered around keeping track of employees and the things that they are doing while also making the information readily available for managers and HR representatives to view and edit.
- **CPSWE-29 Employee Management System**  
by Horacio Garcia, Kristin Hegna, Elijah Connor, Miguel Betancourt Jr  
Major: BSSWE Advisor: Dr. Hassan Pournaghshband

This is an employee management system that tracks employee performance, vacation days and sick days. The system allows human resources and managers to access employee data, and allows employees to file complaints regarding incorrect personal information.

- o **\* CPSWE-30 Microservice Architecture & DevOps**

by Erik Knudsen, Laura Johnson, Nate Pattharakositkul, Rony Campos, Shahnawaz Bhimani

Major: MSSWE Advisor: Dr. Hassan Pournaghshband

Software teams have traditionally developed large, monolithic applications. These applications end up difficult to maintain as their codebases grow and technology platforms become outdated. Organizations may release new versions of such software on a quarterly or monthly basis. The application of DevOps principles and microservices architecture offers an alternative to developing monolithic applications, resulting in better scalability, better maintainability, better re-use of code, and better deployability. For example, instead of one deployment every quarter, a DevOps organization can deploy multiple times per day, if needed. Microservice architecture is the concept of building an application as a suite of small services, where each service does one and only one business function. Each microservice is run by its own team of developers and operations staff with a focus on build, test, and deployment automation. Service-to-service communication occurs over a lightweight protocol such as HTTP. Containerization is used for extremely fast and efficient scalability. Our project focuses on applying microservices architecture and DevOps principles to the design of a typical enterprise-like Human Resources (HR) web application. Our model allows specific parts of the application to change independently, allows for near-instant deployment of code from GitLab to Amazon Web Services (AWS) production after a code commit, has theoretically infinite scalability via AWS Elastic Compute Cloud (EC2), and almost near-instant scalability by running each microservice in a Docker container in AWS's EC2 Container Service (ECS). Our application can dynamically respond to increased demand faster and at a lower cost versus competitors using monolithic designs running on traditional virtual machines. We can also add functionality at any time to meet emerging market trends, beating those same competitors to the market by weeks or perhaps even months. Changes to one business function are isolated to just that microservice, reducing each team's testing burden. Because new applications can use our microservices by making simple HTTP calls, new development projects that need to access HR services can get to production quicker. Finally, each microservice can be developed using its own programming language, allowing the best language to be chosen for a specific business problem. We believe the microservice model we have applied can be extended to the concept of foundation services. Foundation services would encompass low-level application functionality that could theoretically span multiple application domains across an enterprise, allowing new development projects a high rate of code re-use. For instance, a CRUD microservice has the potential to be used by most web applications, freeing each enterprise development team from writing the same CRUD logic and thereby avoiding duplicating that code across the enterprise many times over. Foundation services could also be applied to other areas, such as asynchronous message queuing, validation, machine learning services, cryptographic services, and others.

## \* Candidates for the best game award

- **GM-01 Aegri Somnia: A 3D Puzzle Game**  
by Chelsea Engert, Blake Barfield, Cassidy Caruso, Robert Nibbs, Daniel Valenzuela  
Major: BAACS & BSCS Advisor: Dr. Edward Jung  
Aegri Somnia is three-dimensional puzzle game designed in Unity Engine. The goals of the game are to test user memory and puzzle-solving skills through an entertaining medium.
- **GM-02 The Secrets of the Alluvium**  
by Alexander Dishinger, Brandon Seals  
Major: BSCGDD Advisor: Dr. Allan Fowler  
The Secrets of the Alluvium is a single player RPG. The protagonist is the ruler of a mythical race known as the Alluvium. The Alluvium are creatures that were made by combining magic and the earth. The Alluvium were created as slaves, but learned the secrets of magic and broke free from the humans. Unfortunately the Alluvium are naive and their ruler, the main character, hides some dark secrets from his/her people. The target audience are RPG players that are familiar with world of warcraft and Skyrim.
- **\* GM-04 Little Wars**  
by Brandon Macauley, Brennan Sanford, Aarth Thakore, John Ellis  
Major: BSCGDD Advisor: Dr. Allan Fowler  
A turn-based war game with physics elements made with the Unity engine. Makes uses of a single player AI and local multiplayer with plans for further online options and a map making toolset.
- **\* GM-05 Blinding Steel**  
by Eric Dillon  
Major: BSCGDD Advisor: Dr. Allan Fowler  
Blinding Steel is an endless running action game where you control an unnamed ninja fighting off enemies while jumping across tree branches. Use money collected from enemy ninjas to buy skills and armor to customize your own play experience.
- **\* GM-06 Cyber**  
by Garrett Eddy  
Major: BSCGDD Advisor: Dr. Allan Fowler  
Cyber is a fast-paced 3D platforming game with a focus on movement. The player uses parkour-styled abilities to traverse levels while dodging lasers and turrets.
- **\* GM-07 Cop E. Wright: A Capstone Game**  
by Henrique Lima, Marcus Ford  
Major: BSCGDD Advisor: Dr. Allan Fowler  
2D Action Platformer/Shoot'em Up: This game includes exploration and physical challenges such as strategic movements (dodging oncoming obstacles); it also includes physical conflict challenges like boss battles.

- **GM-08 Bloodstream VR**  
by Kalib Crone  
Major: BSCGDD Advisor: Dr. Allan Fowler  
Virtual Reality project being built for students of The University of Georgia's School of Veterinary Medicine as a lab to help students visualize and learn about different types of blood cells and how they act in different species.
- **GM-09 My Kingdom for a Sword**  
by Seba Hirmanpour, Gavin Barnes  
Major: BSCGDD Advisor: Dr. Allan Fowler  
An digital based card game that includes the awesome most amount of awesomeness possible. It's better than Magic
- **GM-10 Hunt and Dine**  
by Xavier Standley  
Major: BSCGDD Advisor: Dr. Allan Fowler  
Hunt and Dine is a side-scrolling, action, platformer where the player engages in hunting animals, using their parts to make food and delivering that food to different people.

## Graduate Research (32)

### \* Candidates for the best graduate research project award

- **GRDA-01 Threat Detection in TSA Wave Scans**  
by Lauren Staples  
Major: Analytics and Data Science Advisor: Dr. Mingon Kang  
This project uses machine learning to predict the presence of threats in airline passenger scans as they progress through security. This is a Kaggle Data Competition Submission to the contest "Passenger Screening Algorithm Challenge" sponsored by the U.S. Department of Homeland Security et al. This project also serves as the final project for Dr. Kang's Big Data Analytics course CS7265.
- **GRDA-02 Image Segmentation**  
by Mohammad Masum  
Major: Analytics and Data Science Advisor: Dr. Mingon Kang  
This project is about predicting an image whether it's an internet advertisement or not. There are more than 3000 observations of images are in the data set with label whether an image 'ad' or 'nonad'. Our goal is to train the data with different classifier algorithm and then test with new instances. Finally, our goal is to compare the performances of output of different algorithms.
- **GRDA-03 Image Approximation with GA**  
by Andrew Henshaw  
Major: Data Science and Analytics, Ph.D. Advisor: Dr. Mingon Kang  
This project demonstrates the use of a genetic algorithm to optimize the placement and color of a small number of triangles in order to reconstruct and approximate a reference image.
- **GRDA-04 Community Crime Prevention Strategy**  
by Sanjoosh Akkineni



Major: Ph.D. in Analytics and Data Science Advisor: Dr. Mingon Kang  
Communities within the United States. The data combines socio-economic data from the 1990 US Census, law enforcement data from the 1990 US LEMAS survey, and crime data from the 1995 FBI UCR. Many variables are included so that algorithms that select or learn weights for attributes could be tested. However, clearly unrelated attributes were not included; attributes were picked if there was any plausible connection to crime (N=122), plus the attribute to be predicted (Per Capita Violent Crimes). The variables included in the dataset involve the community, such as the percent of the population considered urban, and the median family income, and involving law enforcement, such as per capita number of police officers, and percent of officers assigned to drug units. The per capita violent crimes variable was calculated using population and the sum of crime variables considered violent crimes in the United States: murder, rape, robbery, and assault. There was apparently some controversy in some states concerning the counting of rapes. These resulted in missing values for rape, which resulted in incorrect values for per capita violent crime. These cities are not included in the dataset. Many of these omitted communities were from the midwestern USA. Data is described below based on original values. All numeric data was normalized into the decimal range 0.00-1.00 using an Unsupervised, equal-interval binning method. Attributes retain their distribution and skew (hence for example the population attribute has a mean value of 0.06 because most communities are small). E.g. An attribute described as 'mean people per household' is actually the normalized (0-1) version of that value. The normalization preserves rough ratios of values WITHIN an attribute (e.g. double the value for double the population within the available precision - except for extreme values (all values more than 3 SD above the mean are normalized to 1.00; all values more than 3 SD below the mean are normalized to 0.00)). However, the normalization does not preserve relationships between values BETWEEN attributes (e.g. it would not be meaningful to compare the value for whitePerCap with the value for blackPerCap for a community) A limitation was that the LEMAS survey was of the police departments with at least 100 officers, plus a random sample of smaller departments. For our purposes, communities not found in both census and crime datasets were omitted. Many communities are missing LEMAS data.

- o **\* GRDA-05 Dog breed identification**

by Liyuan Liu, Yiyun Zhou

Major: Ph.D. in Analytics and Data Science Advisor: Dr. Mingon Kang

Image classification is the most important part of digital image analysis. The dog breed identification should give a huge contribution to Animal Shelter, pet adoption center and pet store to classify the dogs. This technology will also widely used in E-commerce industry and retail industry.

- o **GRCS-06 Updating an IDS at Real Time**

by Alexander Federico

Major: MSCS Advisor: Dr. Dan Lo

Project that develops an Intrusion Detection System to update at a set time and prevent the system from being vulnerable while updating.

- o **GRCS-07 Machine Learning Movie Prediction**

by Andrew Granr



Major: MSCS Advisor: Dr. Mingon Kang

The purpose of the project is to use machine learning techniques to determine the success of a movie on the released date.

- **GRCS-08 Analysis of hotel reviews using ML**  
by Jiaxin Chen  
Major: MSCS Advisor: Dr. Mingon Kang  
This project applied Machine Learning technology on analyzing the customers' reviews of hotels in Las Vegas strip, and which features will play a key role in influencing the scores.
- **GRCS-09 SQL Injection with FindSecurityBugs**  
by Peter Ding  
Major: MSCS Advisor: Dr. Kai Qian  
An introduction to SQL injection attacks and how to prevent them with secure mobile software development by building a SQL injection detector with FindSecurityBugs
- **GRCS-10 Titanic Survival : Machine Learning**  
by Sweta Patil  
Major: MSCS Advisor: Dr. Mingon Kang  
Use machine learning techniques to do the 'Titanic Survival Analysis' using the data sets from Kaggle.com
- **GRCS-11 NLP for SMS SPAM Messages**  
by Uday Bhaskar Boyanapalli  
Major: MSCS Advisor: Dr. Mingon Kang  
To build a Spam detection filter using a Machine Learning Algorithm, such as Natural Language Processing for UCI real data for SMS Spam Messages.
- **GRCS-12 Video Compression Optimization**  
by Wenchan Jiang  
Major: MSCS Advisor: Dr. Ming Yang  
High efficiency Video Coding (HEVC) has been deemed as the newest video coding standard of the ITU-T Video Coding Experts Group and the ISO/IEC Moving Picture Experts Group []. HEVC has the potential to deliver better performance than earlier standards such as H.264/AVC. The reference software (i.e., HM) have included the implementations of the guidelines in appliance with the new standard. The software includes both encoder and decoder functionality. Machine learning (ML) works with data and processes it to discover patterns that can be later used to analyze new trends. ML can play a key role in a wide range of critical applications, such as data mining, natural language processing, image recognition, and expert systems. Deep learning refers to neural networks with multiple hidden layers that can learn increasingly abstract representations of the input data. In this research project, in compliance with H.265 standard, we are focused on improvement of the performance of encode/decode by optimizing the partition of prediction block in coding block with the help of supervised machine learning.
- **\* GRCS-13 Fog-Cloud Storage Audit Service**  
by Yeojin Kim, Donghyun Kim, Junggab Son, Wei Wang, YoungTae Noh  
Major: MSCS Advisor: Dr. Donghyun Kim  
The paper introduces a new fog-cloud storage architecture which will offer much higher throughput compared to the traditional central cloud storage

architecture. The proposed architecture provides transparency in a sense that an end user device does not know the existence of fog storage, and only needs to upload its request toward the central cloud. Also, it provides a stronger audit scheme which is naturally coupled with the initial data upload process and does not suffer from the replay attack using old proof of data soundness.

- **GRCS-14 Sharing Lecture Contents via Cloud**

by Nidihi Patel, Jing (Selena) He  
Major: MSCS Advisor: Dr. Jing (Selena) He  
Sharing of Lecture Contents via Clouds

- **GRCS-15 Data Analysis Approaches**

by Arialdis Japa, Yong Shi  
Major: MSCS Advisor: Dr. Yong Shi  
This project analyzes various data sets with different approaches. It starts with literature survey, followed by proposed algorithm to analyze big data sets.

- **\* GRCS-16 Credit Card Fraud Detection**

by Amruta Mangaonkar, Mingon Kang  
Major: MSCS Advisor: Dr. Mingon Kang  
As part of project, we will build a machine learning model and train it to predict if a credit card transaction is fraud or not. The data-set used for training contains transactions made by credit cards in September 2013 by European card holders.

- **\* GRCS-17 Malware Detection**

by Euseong Ko  
Major: MSCS Advisor: Dr. Donghyun Kim  
The recent years have witnessed that significant damage has been made by critical malware such as ransomware. So far, many efforts have been made to detect malware and prevent it from damaging users by monitoring network packets. Unfortunately, such approach is hardly applicable to detect the advanced malware, which utilizes encryption to hide its presence and malicious intent. Cryptoanalysis of each packet flowing over a network might be one feasible solution for the problem. However, this approach is time-consuming and not accurate, and therefore not practical. In this paper, we first conduct a comprehensive analysis to discover unique signatures of RC4 that its ciphertexts exhibit unique statistical patterns when they are encrypted with a fixed known key. By utilizing this discovery as a cornerstone, this paper introduces a novel approach to detect malware packets encrypted by RC4 without decryption. To the best of our knowledge, such unique signatures have never been discussed in the literature. Our experimental results with actual malware packets show that the proposed scheme is extremely fast and highly accurate to detect malware which exploits RC4.

- **\* GRCS-18 Malware Image Classification by ML**

by Jhu-Sin(Samuel) Luo  
Major: MSCS Advisor: Dr. Dan Lo  
Malware classification is a critical part in the cybersecurity. Traditional methodologies for the malware classification typically use static analysis and dynamic analysis to identify malware. In this paper, a malware classification methodology based on visualizing the malware and extracting local binary

pattern (LBP) features is proposed. Firstly, malware images are reorganized into 3 by 3 grid which is mainly used to extract LBP feature. Secondly, LBP is implemented on the malware images to extract features in that it is useful in pattern or texture classification. Finally, Tensorflow, a library for machine learning, is applied to classify malware image with the LBP feature. Performance comparison results among different classifiers with different image descriptors demonstrate that our proposed approach outperforms others.

- **\* GRCS-19 MOEA in Image Segmentation**  
by Wajira Abeysinghe  
Major: MSCS Advisor: Dr Chih-Cheng Hung  
Multi Objective Evolutionary Algorithm(MOEA) is using for optimizing multiple objectives in Image Segmentation.
- **\* GRCS-20 Security Risks in EHR Applications**  
by Maryam Farhadi, Dr. Hisham Haddad, Dr. Hossain Shahriar  
Major: MSCS Advisor: Dr. Hisham Haddad  
The project is to study electronic medical record application (Known as OpenEMR) and assess security and privacy risks associated with OpenEMR. This work is part of a thesis project, during which we will examine a number of common open source OpenEMR applications for the presence of security and privacy vulnerabilities and their compliance with the Health Insurance Portability and Accountability Act (HIPAA) regulations.
- **GRCS-21 Training at the Poles**  
by Michael Kranzlein  
Major: MSCS Advisor: Dr. Dan Lo  
Analyses the effects of omitting non-polar training data for review sentiment polarity classification using SVMs
- **\* GRCS-22 Malware Detection Using Gspan**  
by Nusrat Asrafi  
Major: MSCS Advisor: Dr. Dan Lo  
The project is about malware detection using Frequency Based Graph Mining and Machine Learning Algorithm. We used Gspan algorithm to malware behavior data for finding the pattern and Applying machine learning for detecting malware.
- **\* GRCS-23 Creating Artificial Cognition**  
by Oscar Garcia, Jing (Selena) He  
Major: MSCS Advisor: Dr. Jing (Selena) He  
Creating Artificial Cognition: A Neural Network to Solve Synthesis Insight Problems
- **GRCS-24 Roof Image Classification**  
by Rehnuma Afrin, Mingon Kang, Chih-Cheng Hung  
Major: MSCS Advisor: Dr. Mingon Kang, Dr. Chih-Cheng Hung  
We are using two types of roof images. We will align the images before training them. Finally we will apply Convolutional Neural Network(CNN) based classification of the images in CAFFE.
- **GRCS-25 Compressed Sensing of MRI**  
by Srivarna Settisara Janney, Dr. Sumit Chakravarty

Major: MSCS Advisor: Dr Chih-Cheng Hung

Applying Compressed Sensing to Medical images(MRI) offers potentially significant scan time reductions, with benefits for patients and retain good quality images for accurate diagnoses by doctors. We are using weighted tree wavelet based sparsity matrix to reconstruct images with fewer errors in less time.

- o **\* GRCS-26 Identifying GBM Cancer Subtypes**

by Tejaswini Mallavarapu, Mingon Kang

Major: MSCS Advisor: Dr. Mingon Kang

Glioblastoma multiforme (GBM) is the most fatal malignant type of brain tumor with a very poor prognosis and with a median survival of around one year. Identifying tumor subtypes may play important roles in determining the survival rates in GBM. We developed pathway-based clustering method using Restricted Boltzmann Machine (RBM), called R-PathCluster, for identifying unknown subtypes with pathway markers of gene expressions and performance of R-PathCluster is assessed several clustering methods such as k-means, hierarchical clustering, and RBM models with different input data. R-PathCluster showed the best performance in clustering longterm and short-term survivals, although its clustering score was not the highest among them in experiments.

- o **\* GRCS-27 Secure protocol in Power Grids**

by Uday Bhaskar Boyanapalli

Major: MSCS Advisor: Dr. Donghyun Kim

Power Grids are using Open protocol, such as DNP3 which will is vulnerable to cyber attacks. This communication protocol is secured by Securing communication protocol in the Power grid network. For this project I have built a Power grid communication as Master and Outstation on DNP3 protocol on Raspberry Pi(RPi) and did a penetration testing. For securing the communication, I am building the Public key Infrastructure(PKI) on the DNP3 protocol.

- o **GRCS-28 MRF and BA in 3D Image segmentation**

by VAIBHAV PANDEY

Major: MSCS Advisor: Dr. Chih-Cheng Hung

This research project introduces a new 3D segmentation technique that utilizes bees algorithm as optimization tool in the Markov Random Field (MRF) model. For image segmentation, image labeling is performed, wherein each pixel is associated with a label pertaining to a class or region. The problem here is how to choose a label for a pixel. To overcome this problem, a probabilistic image model is built using MRF, wherein most likely labeling is selected for each pixel based on the neighborhood pixels.

- o **GRCS-29 Secure Mobile Software Development**

by Xianyong Meng, Kai Qian

Major: MSCS Advisor: Dr. Kai Qian

In this project we present a static security analysis approach with open source FindSecurityBugs plugin for Android Studio IDE. We categorized the common mobile vulnerability for developers based on OWASP mobile security recommendations and implemented and developed detectors with FindSecurityBugs to meet the Secure Mobile Software Development(SMSD)

needs in industry and education field.

- **\* GRCS-30 Predict and Prevent College Dropout**  
by Nelson Zange TSAKU  
Major: MSCS Advisor: Dr. Mingon Kang  
Predictive model to predict college dropout at Kennesaw State University, specifically in the College of Computing and software engineering
- **\* GRCS-31 Panorama image auto scroll**  
by Kritika Garg, Mingon Kang  
Major: MSCS Advisor: Dr. Mingon Kang  
Title: Android application: Panorama image auto scroll with face movement.  
Description: There will be two layouts, one for camera which will detect the face and second one for Panorama Image. Initially, Panorama Image will be on its center view. After that If the face will move to the left then image will scroll to the right and will show the left view of the image. Similarly, If the face will move to the right then image will scroll to the left and will show the right view of the image. It will also display the age and gender of the face while detecting.
- **GRIT-32 Object recognition using Visual C++**  
by Anil Kumar Sreedharala  
Major: MSIT Advisor: Dr. Ming Yang  
This project will utilize Neural Network (NN) and Deep Learning to improve the mortgage/loan application and approval processes

## Internships/Student Chapters (8)

- **OTHER-01 Travelport Internship Opportunity**  
by Victoria Williams  
Major: BSSWE Advisor: Professor Dawn Tatum  
This summer and fall I interned at Travelport as a Soft. Systems Engineer. So far, I have completed two main projects, a cloud data aggregation mechanism and an adapted Agile Scrum framework.
- **OTHER-02 ServiceNow Projects at Aaron's Inc.**  
by Benjamin Kaguwo  
Major: BSSWE Advisor: Professor Dawn Tatum
- **OTHER-03 Technical Support Engineer at ServIT**  
by Tommy Mallis  
Major: BSIT Advisor: Professor Dawn Tatum
- **OTHER-04 HP Internship**  
by Jere'l McElroy  
Major: BSIT Advisor: Professor Dawn Tatum
- **OTHER-05 Ventiv Technology Internship**  
by Michael Olivier  
Major: BASIT Advisor: Professor Dawn Tatum
- **OTHER-06 SVK Systems IT Admin and Data Analysis Internship**  
by Harika Parvathareddy  
Major: BSIT Advisor: Professor Dawn Tatum
- **OTHER-07 Keystone Games Internship**  
by Davison Schuitema  
Major: BSCCGD Advisor: Professor Dawn Tatum



- **OTHER-08 UPS Internship - Customer Engagement Platform**

by Kyle Mayes

Major: MSCS Advisor: Professor Dawn Tatum

## Undergraduate Research and HS (17)

### \* Candidates for the best undergraduate research project award

- **URHS-01 Smart Smoke Detector**

by Ashwin Kannan, Jing (Selena) He

Major: Kennesaw Mountain High School Advisor: Dr. Jing (Selena) He

Smart Smoke Detector

- **URHS-02 EEG Readings to Satisfaction**

by Aaron Smith

Major: High School Intern Advisor: Dr. Hossain Shahriar

My research investigates the potential link between Electroencephalography and general satisfaction of a consumer in a market scale. This is done using a EEG reader interface to quantify the satisfaction of the consumer, and in turn, develop an opinion of the quality of the product without asking the consumer a question (providing a more reliable source of consumer satisfaction).

- **URCS-03 VR Applications in Training**

by Anthony Schell

Major: BSCS Advisor: Dr. Sarah North

A research project for my User Interface Engineering course outlining the potential benefits and drawbacks of virtual technology in the workplace. Specifically, the experiment targets the training of employees compared to the experience done with another human being, and data collected on the efficiency of the training as well as the experience each employee had as a result of the training.

- **URCS-04 Analysis of Allstate Claims**

by Joshua Saxton

Major: BSCS Advisor: Dr. Mingon Kang

Big Data analysis using some machine learning algorithms to help Allstate manage different claim data and predict which factors influence a loss in their insurance business.

- **URCS-05 A Threat to Safety and Privacy**

by Mohamed Kabad, Shainu Vazhathil, Matt Hull, Aniruddh Kathiriya, Shivani Patel, Mark Hutto

Major: BSCS Advisor: Dr. Sarah North

Our research project is about the safety and security requirements of drone usage, specifically the DJI Phantom 4, while focusing on the main processes used to.

- **URCS-06 Research on DJI Phantom 4**

by Wei Chen

Major: BSCS Advisor: Dr. Sarah North



The main purpose of this study is to discover the new unmanned aerial vehicles called DJI Phantom 4 Advanced Quadcopter Drone by the means of studying the academic journals and real experience of using this device. DJI Phantom 4 Advanced Quadcopter Drone is one of the most popular unmanned aerial vehicles that provide people an amazing experience of enjoying the fantastic view brought by drones. Its powerful features allow people to explore more amazing things of this world. The future of DJI Phantom 4 Advanced Quadcopter Drone is very promising as this kind of technology will keep creating more good features beyond our imaginations; however, it also brings concerns to public that whether the use of drones will violate people's privacy.

- o **URCS-07 Impact of Drone on Agriculture**

by John Lee, Abdullah Alamri, Caylor Sirk, Franceso Benjamin, Ashley Archibald, Daylon Janis & Yekta Yalcin

Major: BSCS Advisor: Dr. Sarah North

The goal of this paper is to explore the impact of unmanned aerial system drones in agriculture. This paper provides detailed understanding on agriculture drone under logical headings, which will help the reader in interpreting the future scope of using drones in the agriculture sector. We specifically zoom in on the aid that drones give other than just flying. Drones can survey large areas of land without the inherent safety risks and high costs involved with the use of much larger manned aircraft, and the use of these UAV Systems can provide real time imagery and sensor data from farm field areas, which cannot be quickly accessed on foot or by vehicle.

- o **URCS-08 IoT-based Motion Control System**

by Deja Tyla Jackson, Zoe Cesar, Jacob Martinez

Major: BSCS Advisor: Dr. Selena He

Our project involves an IoT based Motion Control System. This system is a Proof-of-Concept Implementation on Robotics using Internet-of-Things (IoT) Technologies. Technologies involved include an Arduino 101, Raspberry Pi 3 controlled robot and cloud server.

- o **\* URCS-09 Applications of AugmentReality in Education Using HoloLens**

by Quinten Whitaker, Trevor Bradford, Ronald Brooks, Tyler Crawley, David Howard

Major: BSCS Advisor: Dr. Sarah North

In this study we look at the history of augmented reality up until where it is today, and then we look into the potential future applications and implications primarily within the realm of education. We explore one particular medical study that surveyed the realism of holographic simulation to visualize internal body parts. We also explore an implementation, loading a hologram into a virtual environment to understand the technology better.

- o **\* URCS-10 Alternative Weighted Fuzzy C Means**

by Michael Wong, Eric Tran

Major: BSCS Advisor: Dr. Chih-Cheng Hung

With our project, we are performing image segmentation with our new algorithm AWFCM(alternative weighted fuzzy c means)

- o **\* URCS-11 Automated Macro Malware Detection**

by Ruth Bearden

Major: BSCS Advisor: Dr. Dan Lo

This project demonstrates the effectiveness of automating Microsoft Office macro malware using machine learning classifiers.

- o **URCS-12 Develop UI for Drone on the Apps**

by Kelly Duong, Solyana Ayele, Somone Letman, Justin Moon, Allan Gao, Zach Black & Erik Baker

Major: BSCS Advisor: Dr. Sarah North

Professional videotaping is a costly and time consuming process. With the availability of inexpensive and powerful drones, it is possible to let drones automatically follow a user for videotaping. The objective of this study is to describe the techniques used to create a drone application that can follow its subject without the use of GPS, but instead through the utilization of a mobile device such as a smartphone or tablet computer.

- o **\* URCS-13 VR Locomotion and its Effects**

by Mark Chamberlain, Alex Kimbell, William Dingler, Vojtech Martinek, Ryan Drumm, Troy Wu

Major: BSCS Advisor: Dr. Sarah North

With the recently growing phenomenon of Virtual Reality(VR) as a popular form of entertainment, researchers are now placing their efforts in developing ways to use Virtual Reality practically as well as for leisure. VR opens new means through which real activities can be simulated, opening opportunities not only for entertainment but for training and education. In recent years there has been an explosion in the production and design of Virtual Reality software and gaming apparatus, and with any development thorough examination is required.

- o **URCS-14 Unmanned Security Drones**

by Tyrone Marshall, Jayson Swartz, Justin Comer, Tong Chen, Janelle Bright, Micah Veale

Major: BSCS Advisor: Dr. Sarah North

The Primary objective of this research is to the use of small drones for personal security uses. We will create a prototype GUI that is connected to a Bebop 2 drone. Features will include are the ability to take a picture though the drone, see live feedback to the drone, and make the drone turn around. In addition to the app, we'll determine how effective a security drone will be, and we will send a survey to the public to see if the public will want to buy a security drone

- o **\* URIT-15 Analysis of Brain Control Drones**

by Adnan Rashied, Jason Walters, Cheyenne Sancho, Josh Cooper, Ahmad Alissa, Eric Rawls & Kade Randall

Major: BSIT Advisor: Dr. Sarah North

The main objective of this study is to find efficient ways to utilize brain control headsets in conjunction with unmanned aerial drones. This study will research how effective the EPOC+ is by challenging users of different genders and ages to complete tasks using mental commands or facial expressions to control a Parrot AR-Drone 2.0.

- o **\* URIT-16 Food For Thought**

by Mizzani Walker-Holmes, Jihwan Oh, Miriam Chapellka, Dorris Scott

Major: BSIT Advisor: Dr. Carl DiSalvo

This project explores public opinion on the Supplemental Nutrition Assistance Program (SNAP) in news and social media outlets, and tracks elected representatives' voting records on issues relating to SNAP and food insecurity. We used machine learning, sentiment analysis, and text mining to analyze national and state level coverage of SNAP in order to gauge perceptions of the program over time across these outlets. Preliminary results indicate that the majority of news coverage is negative, more partisan news outlets have more extreme sentiment, and that clustering of negative reporting on SNAP occurs the South. Our final results and tools will be displayed in an on-line application that the ACFB Advocacy team can use to inform their communication to relevant stakeholders.

o **\* URSWE-17 Guidelines to avoid analyst mistakes**

by Ruth Petit - Bois

Major: BSSWE Advisor: Dr. Paola Spoletini

In a previous study involving student analysts conducting requirements elicitation interviews, several common mistakes were identified and catalogued after a thorough analysis was made by the study's contributors. The analysis revealed that there were 9 major points of contention that prevented the student analysts from resolving all ambiguities from their requirements gathering interview. The issues are as follows: (1) Wrong Opening, (2) Ambiguity Not Leveraged, (3) Implicit Goals, (4) Implicit Stakeholders, (5) Limitation in Terms of Resources Not Considered, (6) Non-Functional Requirements Not Considered, (7) Interrogation-like Meetings, (8) Problems Phrasing Questions, & (9) Wrong Closing. This research goes into detail as to what these problems mean as defined in the referenced paper, and provide ways to prevent or recover from those mistakes once they are made in an interview. The guidelines were established after combing through several reliable resources using a systematic literature review on the guidelines.

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