

Fall 2016 C-Day Program

Thursday, December 1, 2016

Location: S2 Gymnasium



C-Day Home Page

Return to the C-Day home page.



Fall 2016 Press Story

Read the KSU News story about C-Day.



Flash Session Presentation

Download the C-Day Flash Session Presentation.

4:00 pm - 5:00 pm

Set-up (presenters only)

5:00 pm - 5:05 pm

Welcome from Dean Preston and Introduction of Keynote Speaker

5:05 pm - 5:20 pm

Keynote Speaker - [Frank Ziller, CIO Intellitech](#)



5:20 pm - 5:30 pm

Introduction of [Judges](#) by Dean Preston

5:30 pm - 6:00 pm

Flash Session for Posters (30 seconds per poster)

6:00 pm - 6:45 pm

[Judging of Student Posters and Games](#)

6:45 pm - 7:30 pm

Refreshments and Browsing

7:30 pm - 8:00 pm

Presentation of Awards:

- Best Game
- Best Capstone Project
- Best Undergraduate Research Project
- Best Graduate Research Project
- Award of Excellence in Sensor Technology by Shaw Industries Group, Inc
- Kindle Fire Raffle by HPCC Systems

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Judges

1. Ray Albert - *Consulting Systems Eng/Mgr*, LexisNexis

2. Paul Bartlett - *GGDA Atlanta Chapter Co-President*, Georgia Game Developer's Association
3. Donny Bridgemohan - *Senior Talent Acquisition Consultant*, Fiserv
4. Frank Cardillo - *Application Lead*, Georgia-Pacific
5. Steve Cavanaugh - *Director*, Information Technology, Printpack, Inc.
6. Keith Deininger - *Sr Security Analyst*, Independent contractor
7. Sheryl Duggins - *Professor*, KSU, Department of Software Engineering and Game Design
8. Chase Elliott - *UIITS - Infrastructure Support Services Engineer*, Kennesaw State University
9. Andrew Greenberg - *Executive Director*, GGDA/HDI
10. Nathan Haas - *Business Support Services Manager*, Shaw Industries Group, Inc
11. Sheila Haugen - *IT Manager*, Georgia-Pacific, LLC
12. Wes Hogarth - *Research Technologist & IT Manager*, Georgia Tech Research Institute
13. Michael Hug - *Linux Systems Administrator, Staff*, Fiserv.
14. John Johnston - *Senior Solutions Architect*, ProArch - Microsoft
15. Daniel Jones - *Sr Systems Analyst*, Georgia-Pacific LLC
16. Zachary Kennel - *Software Engineer*, LexisNexis
17. Dean Matthews - *Director, Learning & Development*, InComm
18. Suneel Mendiratta - *Vice President - Product Development*, ADP
19. Matt North - *Security Engineer*, FORTINET
20. Michael Phillips - *Director of Talent Acquisition*, InComm
21. Trevor Sands - *Data Scientist*
22. Foster A. Scotland - *IT Systems Support Professional V*, Kennesaw State University
23. Bruce Skillin - *Mobile Lead - Consumer Products IT Innovation Team*, Georgia-Pacific Consumer Products
24. David Van Brackle - *Senior Software Engineer*
25. Matthew Williams - *Business Intelligence Developer*, Georgia-Pacific
26. Frank Ziller - *CIO*, Intelliteach

Rubrics

Capstone/ Undergraduate/Graduate Research scale 1 - 5 with 1 representing "Poor" and 5 representation "exceeds expectations"

- o Presentation: visual and verbal (1-5)
- o Methodology/Approach: All required elements are clearly visible, organized, and articulated (1-5)
- o Significance of Contribution: This project adds to the field of study (1-5)

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

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

Games (8)

- **GM-01** Apotheosis
by Joseph DuBois, Mike Grimshaw, Jake Howard
Department: SWECGDD Advisor: Allan Fowler
Game
- **GM-02** Horizon
by Jason Bourn , Jaylin Ferguson-Gillam
Department: SWECGDD Advisor: Allan Fowler
Game
- **GM-03** Lights Out
by Anthony Barrett , Brandon Seals
Department: SWECGDD Advisor: Allan Fowler
Game
- **GM-04** Open the gates
by Preston Waters
Department: SWECGDD Advisor: Allan Fowler
Game
- **GM-05** Patrons
by Anthony Barrett
Department: SWECGDD Advisor: Allan Fowler
Game
- **GM-06** Potion Panic
by Trevor Love
Department: SWECGDD Advisor: Allan Fowler
Game
- **GM-07** Slow Poke
by Michael Isaza
Department: SWECGDD Advisor: Allan Fowler
Game
- **GM-08** Playstation VR Project
by Jason Bourn , Robert Kowalchuk, Robert Jimenez, Kevin Friddle
Department: SWECGDD Advisor: Chao Mei

PSVR - PlayStation Virtual Reality is the latest VR device recently released by Sony. We built interactive games on PSVR, which will provide the players with fully immersive game experiences. The players will make real time strategies and use their body motions to play the game, which is pretty engaging. Please come and be the first group of players on the earth to experience a virtual environment built by CCSE students and generated with the top tier game console - PlayStation 4.

Capstone Projects (29)

- **CP-01** (λ)Machine
by Weston Ford, Derek Maier, David Nelson
Department: CS Advisor: Amber Wagner

The Lambda-Machine platform is a distributed computing framework that is both easy to use and easy to deploy. The mission of this project is to create a tool that computer savvy individuals, such as systems administrators, would find effective, yet intuitive enough that researchers from other fields could harness its distributed computing capability. These are

the driving principles behind the Lambda-Machine project. The Lambda-Machine describes a software mechanism for distributing scripts across nodes in a local area network or virtual private network. The script algorithm will be parallelized and concurrently computed by the nodes on the subnet. The platform features a web-based interface that will allow users to drag and drop scripts to be distributed across nodes within a subnet. The nodes that receive the script will begin executing the script as a local Linux process, all while sending their process information back to the user. This methodology will allow a user to control multiple computers from a central control point that is accessible from a web browser.

- o **CP-02 AccessibilityRF**

by Mayima Clark, Jacob Ertell, John Ellison

Department: CS Advisor: Amber Wagner

Many activation switches for accessible doors may be concealed, hard to reach, or found a far distance from the door. This is a complication that needs to be addressed, and we propose AccessibilityRF: a piece of hardware that allows users to operate accessibility doors remotely. Remote accessible door openers can be developed by reverse engineering radio frequencies activation switches use to open the door when pressed. Signals emitted from the activation switch will be recorded, demodulated, and stored to transmit whenever the developed device is used in front of the door in question. The device will increase accessibility for everyone with mobility impairments and provide a solution to a need that was not addressed previously. In addition to a remote door opener, a companion mobile application was developed to assist Kennesaw State University students in locating accessible doors to educational buildings efficiently on campus.

- o **CP-03 Atlanta Toolbank Tool Reservation**

by Alleyne, Kerwin Shaun, Barahona, Christian Alejandro, Seymour, Alan Garrett, Abdulhadi, Mulk, Guarnieri, Kyla Marie

Department: IT Advisor: Jack Zheng, Mickey Desai

The Atlanta Community ToolBank, a nonprofit organization, stewards an inventory of tools for lending to charitable organizations to increase the impact of their mission-related efforts in the community. Atlanta ToolBank is in need of a member-facing app (or mobile friendly web pages) to automate the tool-lending reservation and confirmation process.

- o **CP-04 AutoMD**

by Jacob Davidson, Christopher Rene, Michael Vanderbilt

Department: CS Advisor: Amber Wagner

AutoMD is an application, which is aimed at helping people determine what caused their car trouble. The application features a system, much like WebMD, which will use feedback from the user to diagnose potential solution to automotive breakdowns and general problems. Many times people have no idea what caused the vehicle breakdown and may or may not know what to do in these times. Our application provides a way for even the most inexperienced person to figure out what is wrong and what to do next when their car breaks down.

- o **CP-05 Chocolate Soup: Quest for the Compiler**

by Jonathan Gascoigne, Nathaniel Jean, Shelby Silcox

Department: CS Advisor: Amber Wagner

We present "Chocolate Soup: Quest for the Compiler," an educational video game geared toward middle school students to adult learners to teach basic programming skills.

"Chocolate Soup: Quest for the Compiler" is an interactive, third person adventure game

that is able to meet the educational needs of the student by providing multiple levels that reinforce the lessons taught from previous levels.

- o **CP-06** Course Substitution Management System

by Bilal Abdullah, Eric Brovont, Samir Dave, Andrew Walker

Department: CS Advisor: Amber Wagner

We have created an automated course substitution management system to be used in higher education. Our system was designed to render course substitution paper forms obsolete. The current system in place at many universities, including Kennesaw State University, is one that requires a form to be filled out by hand and then submitted to a Program Coordinator and Department Chair for approval. There are some issues that can arise from this procedure. Many times forms get lost or are ineligible for submission. Our system is digitally accessible through an OWL Express type system. This makes it easier and more efficient as a process. The system automatically checks to see if the class the student wants to substitute is a valid substitution. A valid substitution entails that the student has taken the prerequisites and fulfills the requirements. If the student does not meet the requirements, our system will raise a red flag and display the reason(s). After the student fulfills the requirements, the student will submit the form, which then automatically goes to the advisor. After an advisor approves, it will then be sent to the Program Coordinator and Department Chair for the last approval.

- o **CP-07** Curriculum Analysis

by Nedko Nedev, Danette Sweat, Maria Vassileva, Mitchell Vega

Department: CS Advisor: Amber Wagner

The Department of Instructional Technology at Kennesaw State University is conducting research, which requires analyzing curriculum standards from all over the world based on several criteria to determine a reliability score which can be used to assess one's own curriculum for improvements, or to compare with other curricula. To resolve this issue, we have created a web application with a SQL Server database that allows users to store curriculum information in a centralized location. The system allows multiple researchers to enter curriculum standards and evaluate them at the same time.

- o **CP-08** DLC training system

by Daniel, Timothy Scott, Griffin, Andrew John, Green, Caleb Reid, Kramer, Kristien T, Huff, Timothy David

Department: IT Advisor: Zhigang Li, Jack Zheng

The Distance Learning Center provides faculty training programs for online faculty at KSU. One of the programs targets new hires. Often times, faculty members, especially part-time faculty members are hired right before the semester starts. While they are going through the HR process, they will need to access the training program to get familiarized with the learning environment and be ready to teach when the HR process is done. However, they will not be assigned with a KSU NetID and have access to various campus resources until the HR process is complete. Currently, the DLC uses D2L Brightspace to deliver its training programs. Due to limited access, the D2L system cannot be used in the situation stated above. Therefore, the DLC is looking for an alternative in addition to D2L to deliver its training programs. Being one of the most popular open-source learning management systems, Moodle is considered as the primary alternative. However, the DLC is open to other recommendations upon the research findings.

- o **CP-09** Domo Arigato, Mr. POSTbotto

by Thompson Wiley, Noor Masood, Ethan Mitchell, Alvaro Ruiz, John Tyburski

Department: SWE Advisor: Hassan Pournaghshband

DAMP is a reddit bot designed to perform moderator tasks and automatically respond to posts and comments based on user specified keywords or phrases.

- o **CP-10** FrigID

by Daniel Heimann, Dylan Vollrath

Department: CS Advisor: Amber Wagner

FrigID is an ingredient tracking and management tool that can be used to make informed decisions. FrigID will use your current inventory and ingredients that are no longer available to create shopping lists. Many people live busy lives and this can make it difficult for shoppers to keep track of which ingredients they currently have or what they need for the meal for which they are shopping. FrigID's implementation aims to solve both of these problems with one solution. By using an Android application with NFC enabled and a Raspberry Pi, we will be able to allow users to keep track of all of the ingredients in their refrigerator or pantry. FrigID will also be able to create personalized shopping lists based on the ingredients that are currently missing. Users will have to scan the ingredient's barcode as they add and remove items from their refrigerator or pantry. When the user wants to update their shopping list all they need to do is tap their NFC enabled Android device to their fridge or pantry. As an added enhancement, we will also enable our users to add all of their ingredients by taking a picture of their grocery receipt, this way shoppers will not have to worry about scanning individual items. Not only will FrigID include a grocery list, but a running list of what is still in stock in your refrigerator will also be available. Our goal is to be able to also have the ability to give users recommendations on recipes to cook using their current inventory.

- o **CP-11** You Pick!

by Enrique Penaloza

Department: CS Advisor: Amber Wagner

While there are other apps that focus on what and where a person should go to eat, those apps still leave the user with the frustration of trying to make a decision that they eventually decide on the closest restaurant to avoid wasting more time. "You Pick" benefits the user by helping him or her speed up the decision-making process and shortening the "Pou pick! No, you pick" conversation.

- o **CP-12** Heat Beep

by In Cho, Michael Clapper, Payne Patzke, James Pyle, Drake Rucker, Josh Saxton

Department: CS Advisor: Amber Wagner

Since 1998, 690 children have died of heatstroke as a result of being left in a hot car, and many more children were injured. These deaths and injuries are completely preventable. There are many situations that may lead to a child being stuck in a hot car, and we are looking to combat those various situations. In order to accomplish this, we have designed a prototype of an inexpensively produced device in hopes of preventing future tragedies from occurring.

- o **CP-13** K.R.A.B. (Keyword-Response Auto-Bot)

by Musab Ahmed, Misti Watkins, Niles O'Keeffe, Jordan Woodman, Shravani Yelakanti

Department: SWE Advisor: Hassan Pournaghshband

A system that automatically detects and responds to Reddit comments based on phrases defined and configured by the client.

- **CP-14** KSU Course Substitution Web System
by Yeojin Kim, Jean-Jeacques Mutekeke, Nidhi Shah, Shiva Voruganti, Junan Zhao
Department: CS Advisor: Amber Wagner
The KSU Course Substitution Web System (CSWS) is a tool that streamlines the process of course substitution requests. The main goal of CSWS is to reduce the amount of paperwork required to approve a course substitution and generate output electronically. Our solution resolves the issues of the current system (i.e., performance, time, and flexibility) in an efficient way using web technologies incorporated with OWL Express.
- **CP-15** KSU File Transfer System
by Quyunh Dao Do, Josh Darby, Barry Oliver, Olutoni Oluyide
Department: CS Advisor: Amber Wagner
In today's day and age it can be difficult for professors to keep their work secure from students, while being able to share them with other professors in their department. Not only that, but it can be difficult for some of them to get accustomed to new systems, even to the extent that it isn't unheard of for professors to refuse making a Google account in order to access Google drive. While there are many file sharing software applications, there isn't utilized by Kennesaw State University for the purpose of sharing course materials. We plan to change this by introducing a system that can share documents from the department head to all the employees of the department, can allow professors teaching the same classes to compare lecture notes and other documents, as well as allows professors to leave notes or comments about certain documents in a type of discussion board area. All of this will only be
- **CP-16** Live Interactive Technology (L.I.T.)
by Stephen Ajetomobi, David Guidry, Farid Khan, Daniel Louis, Rachael Okogie
Department: CS Advisor: Amber Wagner
Over the course of a college student's academic career, there are a myriad of extracurricular activities and events available for them to attend. These activities vary in nature and range from small-scale events such as a bible study attendance to large-scale events such as a college music festival. There is, however, an issue with choosing an event to attend if a student has multiple or no interests. Students that have no set event to attend become curious about how fun a particular event might be and this causes them to resort to the host's text description of the event, which provides little help. Other students are simply indecisive, and this indecisiveness varies depending on the student; however, from experience, we can infer that environmental and personal factors (e.g., increase in the volume of the student's academic work, an acquisition of a job to aid with school expenses, distance away from campus) play a significant role in their choice to stay in or go out. With an understanding of the factors that guide a student's decision to attend an event, we have come to the basic conclusion that their time is of value and their interest in attending a given event can be influenced if there were some way to relay the state of the event before the student steps foot at the event's location. This is the problem that our application attempts to solve, and our approach to addressing it revolves around providing a feed of videos that are pseudo real-time and that correspond to the events in which the student has a vested interest. The goal of this Android application is to increase the

- participation of students at an event by providing videos posted by other users at the event to those on the edge of attending.
- o **CP-17** Melody Bank
by Marc Ducharme, Justin Fortin, Lawson Welborn
 Department: CS Advisor: Amber Wagner

Melody Bank is an independent, downloadable application for Windows OS, which allows users to collaboratively identify and document recurring musical patterns found in songs. Our application provides an easy and fun way to track down frequently used patterns across unrelated pieces of music as well as to document known leitmotif (recurring musical themes intentionally used by a composer over the course of a sound track or album). As any user is able to report information (e.g., the song name, author, pattern time, and pattern relationship), our application can be considered a sort of Wikipedia for the niche purpose of recording these relationships.
 - o **CP-18** MongoDB Security
by Patel, Anish , Spradlin, Jeffrey Allen , Garcia, Mytee , Davis, Jared S , Goulart, Anne Elizabeth
 Department: IT Advisor: Lei Li, Jack Zheng

New data management systems beyond SQL (NoSQL, or Not Only SQL) have been developed to handle semi-structure and unstructured data. They also pose new security challenges that may be different from RDBMS. In this project, a team of students will investigate the security issues of MongoDB, and implement the security settings on an existing MongoDB database.
 - o **CP-19** Network Traffic Pattern Analysis Based on Armitage Exploits
by Dan Bellamy, Ryan Coughlan, Scott Lewis, Steven Mints, Sara Rico-Larmer
 Department: IT Advisor: Hossain Shahriar, Jack Zheng

We set up a virtual machine with two different operating systems, such as Windows XP and Windows 7, and attacked the two systems using Metasploitable and Kali Linux. Additionally, we capture and log the files during the attacks using Wireshark and other log file processing tools.
 - o **CP-20** Owlendar
by Zachery Cox, Kyle McLendon, Farah Obaidullah, Mohini Patel
 Department: CS Advisor: Amber Wagner

Currently, the way Student Engagement events are presented make it difficult for students and faculty to effectively attend and/or volunteer at the many events presented from the Department of Student Engagement at Kennesaw State University. To better organize the myriad of events, something similar to a Google Calendar app specifically tailored to Student Engagement events was created: Owlendar. All of the events can be seen in a way similar to a physical calendar that you would have on your wall. This calendar is accessible via an application for mobile devices. Using this application will allow students and faculty to see the current and future events, register for volunteer opportunities like blood drives, and a myriad of other events.
 - o **CP-21** ProfShare
by Chris Deakin, Charles Driver
 Department: CS Advisor: Amber Wagner

Currently, the professors at Kennesaw State University do not have a centralized location where they can share and collaborate on course work. Our project is a secure system that allows professors to share their course materials with one another. This system will eliminate the need for professors to email their course materials or use portable storage in

- order to share them with other professors. Instead, this system will give professors a centralized location to keep any lecture materials that on which they wish to collaborate. Also, the system will provide version control to the documents, which will make it easier for course materials to be improved upon. Other features our system will offer include: browser interface, security, and a document viewer.
- o **CP-22** Project Tallulah
by Dan Aviles, Clinton Flowers, Justin Jennings, Jun Nguyen
 Department: CS Advisor: Amber Wagner

Project Tallulah engineered and refined a prototype of a combined communications platform, leveraging the capabilities afforded on technologies like low-cost Android tables in order to provide dedicated information dashboards and software-defined home automation in every room. The project involves mostly browser-based software configured to continuously run on various off-the-shelf hardware devices, with additional platform-specific code for room automation as necessary.
 - o **CP-23** Project Yodel
by Benhamin Cubitt, Steven Jolly, Jonathan Reagan
 Department: CS Advisor: Amber Wagner

Major VOIP programs have sat on either side of a fence: they either over allocate network resources, or is not an ad-hoc network. Our goal was to create a VOIP program that can provide a better service that is both an ad-hoc network and does not over allocate network resources. We utilize users' own machines to store their profiles and settings, the rooms are hosted by an individual user with host swapping when necessary, and it is a lightweight program that does not hinder processing. In order to provide a clear signal at all times, we have the program dynamically swap hosts to the host with the best connection. To minimize the effect of packet loss during switching, switching will only occur once the original host's connection drops below a certain threshold where quality is already an issue and swapping to a new host is a clear improvement.
 - o **CP-24** Skype Bot application
by Ousmane Kore, Fekadu Abebe, Dal Raj, Anil Thakuri
 Department: SWE Advisor: Hassan Pournaghshband

The Skype Bot application is built to automatically respond to a user inquiry. The Skype bot application shall be able to detect user comments and to respond back with the appropriate answer. Moreover it shall allow the administrator to configure the responses.
 - o **CP-25** SSSAJ
by Alyssa Cohen, Stanislav Kolev, James Patterson, Sharmell Smith, Steven St. Amand
 Department: CS Advisor: Amber Wagner

Over the past years, technology users have constantly shared files and important data through the Internet with almost no acknowledgement of security of their information. This leaves their materials open to those who might use it incorrectly. With this in mind, team SSSAJ has developed an encrypted file sharing system. Our goal for this project was to closely look into methods for encryption along with analyzing algorithms that can help perform encryption and decryption in a reasonable set time.
 - o **CP-26** TAG Survey Report
by Perrin, Jonathan Luke, Scent, Bailey Aaron, Chaney, Matthew Ryan, Elder, Jacob Edward
 Department: IT Advisor: Jack Zheng

The Technology Association of Georgia is seeking proposals from qualified firms and/or Universities that are interested in preparing research data to be used to provide insight and trending information on Georgia's technology industry. The results should be accessible by TAG through some form of digital dashboard (example:

<http://tagstateoftheindustry.com/2016/key-findings/key-finding-1.html>). We (KSU researchers) is preparing a proposal and need to investigate and recommend a data visualization and dashboard solution to TAG. The team is charged with research and implementation sample solutions and recommend one.

- o **CP-27** Using Deep Learning to Monitor Parking Spaces

by Jeswin Abraham, Alex Bates, Phillip Bouie, Naga Gattupalli

Department: CS Advisor: Amber Wagner

Many current systems for monitoring parking space usage is very hardware heavy and often not worth the effort of setting up for smaller areas. Instead of tracking parking spaces with hardware in or around each lot, a camera can be used to track multiple spaces at once. This would allow for simpler setup and will assist in pointing out parking issues such as a full lot or long-term over/under use. To accomplish this, we used a deep learning framework to recognize the difference between a parked car and an empty parking space.

- o **CP-28** VRoooom!

by Amber Cunningham, Shannon Dye, Nick Fenton, Justen McLean, Charlotte Nadaud

Department: CS Advisor: Amber Wagner

"VRoooom!" is a virtual reality kart racing game. It is designed to be played using the HTC Vive. Some of the game's features include four karts to choose from, each having different attributes and at least four computer controlled karts for the player to race against. There will be at least one playable environment (racetrack), and we will also incorporate at least five "powerups," which the player will be able to use against his/her opponents.

"VRoooom!" was developed using the Unity Engine along with the Steam VR SDK for Unity.

- o **CP-29** GTRI ticket system

by Anderson, Philip Caleb , Brown, Ryan Daniel , McDonald, Logan M , Weinrich, Paul J

Department: IT Advisor: Jack Zheng, Wes Hogarth (GTRI)

The Georgia Tech Research Institute Electronic Systems Laboratory (GTRI-ELSYS) is an applied research organization that provides technical solutions to a variety of sponsors and supports about 450 researchers and staff. The computer support department develops, maintains, and supports the Information Technology (IT) systems used within GTRI-ELSYS, including servers, workstations, printers, networks, and storage devices. This department is largely responsible for ensuring researchers have the tools necessary to conduct their work. The computer support department currently uses Kayako's eSupport, version 3.70, a web application for submitting trouble tickets. The software uses PHP 5.2, MySQL 5.6, and IIS 7.5 to host the service. This version is rather outdated and Kayako has completely re-engineered their currently offered ticket software. GTRI-ELSYS would like to either get this system upgraded to the latest version Kayako provides or purchase a new system and migrate the tickets over. The tickets must be retained to meet purchasing and ISO 9001 requirements. The new system will need to support multiple departments for submitting both trouble tickets and purchasing requests.

- **UR-01HS** Convolutional Neural Networks for Image Classification With the Nao Robot
by Virinchi Puligundla
Department: CS Advisor: Dr. Chih Cheng Hung
The objective of this work is to design a convolutional neural network that will provide the Nao robot with image classification capabilities.
- **UR-02HS** Picturade
by Armand Marino
Department: CS Advisor: Selena He
Game
- **UR-03HS** User Influence, Peak Activity Intervals, and Longevity as Characteristics of Twitter Hashtags
by Nishant Sethunath
Department: CS Advisor: Dan Lo
This project studies user influence, activity over time, and longevity of Twitter trends as characteristics of Twitter hashtags. The aim is to see if one or more of these variables is associated with Twitter hashtags.
- **UR-04** Defensive Programming
by Joel Kamdem Teto
Department: CS Advisor: Dan Lo
This study creates learning materials that allow students to avoid common security defects, to analyze the relationship between defensive programming and confidentiality, integrity and availability, and to write a secure program. Topics include defensive programming, Secure input validation and output handling, buffer overflow attack and prevention, vulnerabilities in mobile programming, access control and confidential information, mobile malware, restriction on access to components, and isolation of file system and database, injection and inclusion, accessibility and extensibility, mutability, and serialization and deserialization. Another focus in this study is to teach students to create a security-aware application, and tamper resistant software, in which obfuscation is commonly employed.
- **UR-06** Hopper's Fables: A Mathematical Storytelling Adventure
by Deja Jackson, Erica Pantoja, Cindi Simmons, Kate Zelaya
Department: CS Advisor: Amber Wagner
Block Programming languages (e.g., Alice, Scratch) are used heavily in teaching students in K-12 classrooms and in some universities in hopes of bridging programming with beginner students. This is in an effort to encourage students' interest in computer programming utilizing Papert's "low floor" and "high ceiling" metaphor. While the current block languages are helpful and engaging, there are not many offering an emphasis on advancing students' reading and mathematical skills. This presentation describes our creation of a block language using Blockly's API, HTML, JavaScript, and CSS. The language, entitled Hopper's Fables (named after Admiral Grace Hopper), is based on storytelling through completion of mathematical problems with the intention of being highly interactive to engage the students during the learning process. The ultimate goal of Hopper's Fables is to aid elementary students with learning disabilities in strengthening their math and literacy skills, while simultaneously developing the students' computational thinking skills, and building on their digital fluency. By combining Papert's

"low floor" and "high ceiling" philosophy, modeled by other block languages, with educational foundations, Hopper's Fables will provide students with a sound and engaging learning environment.

- **UR-07** One Size Doesn't Fit All

by Zane Johnston

Department: CS Advisor: Amber Wagner

Graphical user interfaces (GUIs) allow users to perform complex tasks through the manipulation of on screen graphical elements. However, the GUI's dependence on traditional inputs (e.g., mouse and keyboard) requiring a certain level of dexterity bars users with mobility impairments from using applications that make use of GUIs. One method for allowing users with mobility impairments to have access to more applications that utilize GUIs is to create a vocal user interface (VUI) mapped to the underlying GUI, allowing the user to perform actions normally achieved through physical input by using voice. Unfortunately, the process of mapping a VUI to a GUI is not always straightforward. In the case of the Myna VUI, which is mapped to the block-based language development environment Scratch, there are three problems in particular that have proven difficult: scaling up and down with different screen resolutions, handling scrollbars, and navigating through dialogs. My work presents general solutions to these three problems in addition to user study results.

Graduate Research (20)

- **GR-01** 3D User Interfaces for the Visually Impaired

by Darren O'Neale, Jerome Lester, Devan Patel

Department: CS Advisor: Rongkai Guo

Initial research plan describing the use of software to enable visually impaired persons to become independent in dynamic, unknown environments. A 3D audio-driven UI demo will be showcased.

- **GR-02** An Internet-of-Things based System to Measure Student Physiological Responses That Indicate Stress, Boredom, and Attention

by Sarah Tippens

Department: CS Advisor: Selena He

When a student comes to class, they sit for an hour and a half, sometimes more, to listen to a professor lecture to the class. With this model of teaching, it is hard to keep student attention and therefore a student may not learn the material as well. This project will focus on an Internet of Things system that will be used in a Smart Classroom environment to gauge a student's attentiveness, boredom, and stress in real-time. The system is a student desk that has built-in sensors to gather a student's physiological responses such as body language, eye-tracking, body temperature, etc. The goal is to create a way for teachers to easily determine how attentive their student's are in class whether it is one student or the entire class. Data will be sent to a mobile application where a teacher will be alerted when students are not attentive in class. This should hopefully help teachers understand the classroom dynamic at any given point during a class. The poster for this project will represent the beginning stages of this research project from background research to a proposed system architecture and plan.

- **GR-03** An Internet-of-Things based System to share lecture notes via clouds
by Nidhi Patel

- Department: CS Advisor: Selena He
- An IoT-integrated system to convert the handwriting on the traditional blackboard to electronic texts, and make them sharable among students
- **GR-04** Authentication Using Iris Detection and Pupillary Response
by Mahbubul Islam
Department: IT Advisor: Hossain Shahriar, Hisham Haddad
- The objective of this work is to develop a biometric authentication system based on both iris detection and pupillary response (pupil light reflex).
- **GR-05** Automatic system for predicting severity of claims in an insurance company
by Lili Zhang
Department: Analytics and Data Science Advisor: Mingon Kang
- The project is to predict claims severity for the chance to be part of Allstate's efforts to ensure a worry-free customer experience.
- **GR-06** Data Preprocessing for Big Data Analysis
by Priyanga Chandrasekar
Department: CS Advisor: Kai Qian
- **GR-07** Feature Selection and Improving Classification Performance for Malware Detection
by Carlos Mora Cepeda
Department: CS Advisor: Dan Lo
- After analyzing the advance of technology, it is clear that use of the Internet, computers, smart phones and tablets has become ubiquitous and therefore, the creation and proliferation of cyber threats and attacks has grown exponentially. Consequently, Anti-Virus companies and researchers have developed new approaches for dealing with discovering and classifying malware. Among these, machine learning and Big Data technologies have been used for feature extraction, detection, and clustering of cyber threats. In this paper, we created and analyzed a dataset of malware and clean files (goodware) from the static and dynamic features provided by the online framework VirusTotal. The purpose is to select the smallest number of features that keep the classification accuracy as high as possible given that the training execution time increase in polynomial time with respect to the number of features. In this research, we found that "9" features are enough to distinguish malware from "goodware" files within an accuracy of 99.60%. Selecting the most representative features for malware detection relies on the possibility of creating an embedded program that monitors the processes executed by the OS looking for the characteristics that match malware behavior. Thus, feature selection was made taking the most important features that keep the accuracy high and allows the creation of monitoring malware detection programs with a low overhead cost. In addition, classification algorithms such as Random Forest (RF), Support Vector Machine (SVM) and Neural Networks (NN) were used in a novel combination that not only showed an increase in accuracy, but also in the training speed from hours to just minutes.
- **GR-08** Gender/Age classification from Facial Image using Deep Learning
by Dhiraj Gharana
Department: Analytics and Data Science Advisor: Mingon Kang
- To estimate gender/age from facial images by using deep learning
- **GR-09** Learning Abstract Mathematical Concepts/Standards on Technology with Interactive Learning Platforms that are Accessible to Students with Low

Social Economic Status Without the Use of Internet

by *Linda Vu*

Department: CS Advisor:

This poster reports initial research plan on Learning Abstract Mathematical Concepts/Standards on Technology with Interactive Learning Platforms that are Accessible to Students with Low Social Economic Status Without the Use of Internet

- o **GR-10** Monitoring and Assessing Traffic Safety Using Live Video Images
 by *Srivarna Settisara Janney, Ishraq Karim*
 Department: CS Advisor: Dr. Chih Cheng Hung

Highway Safety assessment has traditionally been relied on historical crash data and/or field conflict studies. The objective of this research study is to automatically extract conflict event data from the field cameras on the fly. Those conflict events data can be used to proactively diagnose safety issues, and formulate and implement proper countermeasures in a timely manner. It is expected to considerably reduce the number of crashes that could have occurred otherwise.
- o **GR-11** Next Generation of High Efficiency Video Coding Optimization with Deep Learning
 by *Wenchan Jiang*
 Department: CS Advisor: Ming Yang, Ying Xie

High Efficiency Video Coding (HEVC) is the latest video coding standard developed by Joint Collaborative Team on Video Coding (JCT-VC). HEVC can support up to 50% bit-rate reduction for equal perceptual video quality. Experiments will be carried out in order to determine coding performance with different size coding units. The initial results will be further optimized with neural network deep learning techniques.
- o **GR-12** NoSQL Injection Security Analysis and Defense Solution
 by *Boyu Hou*
 Department: CS Advisor: Yong Shi

We demonstrate a server-side JavaScript and HTTP injection attacks and provide defense measures to promote the security of MongoDB.
- o **GR-13** Optimisation of object searching techniques using visual C++
 by *Anil Kumar Sreedharala*
 Department: IT Advisor: Ming Yang

This project is focused on object recognition and tracking via template matching. We utilized the OpenCV library to implement template matching. We investigated various methods of object searching. Optimization has also been implemented to reduce searching time and improve the performance. This project is implemented with Visual C++.
- o **GR-14** Performance Analysis on Deep Machine Learning on CPUs and GPUs
 by *Jhu-Sin Luo, Michael Kranzlein*
 Department: CS Advisor: Dan Lo

Recently, convolutional neural networks (CNNs) have been successfully applied to deep learning applications such as image and video processing and speech recognition due to the technology advancements in both hardware (e.g. more powerful GPUs) and software (e.g. deep learning models, open-source frameworks and supporting libraries). The short training time and high accuracy of CNNs come from the high cost of power consumption with energy lost in a data center, which has been largely ignored in previous CNN design. It is highly desirable to design deep learning frameworks and algorithms that are both accurate and energy efficient with optimal power consumption. In this study, we conduct a comprehensive study on the power consumption and energy efficiency of numerous well-known CNNs and training frameworks on CPUs and GPUs, and we provide a detailed

- dynamic management of CPU and GPU frequencies to facilitate the design of energy efficient deep learning solutions.
- **GR-15** Prediction of the median home values of owner-occupied homes in \$1000's
by *Elliott Billy Saintil*
Department: SWE Advisor: Mingon Kang
The project is to predict the median home values by using linear and ridge regression
 - **GR-16** Prediction of the seismic hazard
by *Yan Wang*
Department: Analytics and Data Science Advisor: Mingon Kang
Seismic hazard is the hardest detectable and predictable of natural hazards. I aim to identify the mechanism of seismic hazard and predict it.
 - **GR-17** The Paradox of Social Media Security: Users' Perceptions versus Behavior
by *Zahra Alqubaiti*
Department: IT Advisor: Lei Li
The thesis explore the relationship between users' security perceptions and their actual behavior on social networking sites. We propose that protection motivation theory (PMT) can be adapted to explain and predict social media users' behaviors that have security implications. A web-based survey will be used to measure users' security awareness on social networking sites and collect data on their actual behavior.
 - **GR-18** What contribute high school graduation rate in the United States?
by *Shashank Hebbar*
Department: Analytics and Data Science Advisor: Mingon Kang
The project is to identify the important factors that contribute to the high school graduation rate of students in the United States
 - **GR-19** Dimensionality Reduction Techniques for Hyperspectral Images
by *Tala Emami, Oscar Garcia*
Department: CS Advisor: Dr. Chih-Cheng Hung, Dr. Jidong Yang, Dr. Ying Wang
The main aim of dimensionality reduction technique is to find a minimal subset of the original hyperspectral image data without losing their physical meaning.
 - **GR-20** Sentiment Analysis and Text Mining of Twitter Data using R
by *Sparsha Pearl Eddu*
Department: IT Advisor: Ms. Jie Hao
Perform Sentiment Analysis and Text Mining on Twitter Data(using R programming language) especially to analyze the sentiments of Twitter users on the results of Election 2016.Sentiment analysis is widely used to track attitudes and feeling on web especially for measuring performance of products,services,brands etc.The purpose of Text mining is to handle unstructured information and perform various data mining algorithms.

Internships and Student Organizations (12)

- **OTHER-01** Graduate Internship Experience
by *Zahra Alqubaiti*
Department: MSIT Advisor: Dawn Tatum
Internship experience

- **OTHER-02** Graduate Internship Experience
by Armughan Qazi
Department: MSCS Advisor: Dawn Tatum
Internship experience
- **OTHER-03** Undergraduate Internship Experience
by Michael Yamashita
Department: CS Advisor: Dawn Tatum
Internship experience
- **OTHER-04** Undergraduate Internship Experience
by Isaac Efik
Department: CS Advisor: Dawn Tatum
Internship experience
- **OTHER-05** Undergraduate Internship Experience
by Srija Kukkadapu
Department: CS Advisor: Dawn Tatum
Internship experience
- **OTHER-06** Undergraduate Internship Experience
by Lisian Ajroni
Department: SWE Advisor: Dawn Tatum
Internship experience
- **OTHER-07** Graduate Internship Experience
by Ilyas Kure
Department: Engineering Advisor:
Internship experience
- **OTHER-08** ACM Student Organization Showcase
by Alex Veselinovic, Taylor Blasingame, Alex Federico, Chris Brutofsky, William Parish
Department: CS Advisor: Sarah North
Association for Computing Machinery Student Chapter Activities Presentation
- **OTHER-09** Club Activities
by AITP Board
Department: IT Advisor: Dawn Tatum
Presentation of Club
- **OTHER-10** Club Activities
by 3C Board
Department: CCSE Advisor: Dawn Tatum
Presentation of Club
- **OTHER-11** IEEE Computer Society Student Organization Showcase
by Victor Sahin, Justin Voorhees, Sanjoosh Akkineni, Nick Pierre, Carlos Mora
Department: CS Advisor: Sarah North
IEEE Computer Society Student Chapter Activities Presentation
- **OTHER-12** Object-Oriented Owls
by OOO
Department: CCSE Advisor: Amber Wagner
Women in computing student organizations

Contact Info

Kennesaw Phone

Campus 470-KSU-INFO
1000 (470-578-4636)

Chastain Road
kennesaw.edu/info
Kennesaw, GA 30144

Media Resources

Marietta

Campus
1100 South
Marietta
Pkwy
Marietta,
GA 30060

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