Spring 2018 C-Day Winners

Category: Graduate Capstone Project

1st place GC-55  House Prices- Regression Techniques by Aakanksha Gupta, Aditi Kasat
   Major: MSCS
   Advisor: Dr. Mingon Kang

2nd place GC-19  Ethical hacking with Raspberry Pi by Don Privitera
   Major: MSIT
   Advisor: Dr. Hossain Shahriar

3rd place GC-02  Medical Image Classification by Jessica Rudd
   Major: MSCS
   Advisor: Dr. Mingon Kang

Category: Graduate Research Project

1st place GR-20  Algorithms to Improve MRI Scanning by Srivarna Settisara Janney, Dr. Sumit Chakravarty
   Major: MSCS
   Advisor: Dr. Chih-Cheng Hung

2nd place GR-16  Training a Neural Network to Walk by Oscar Garcia
   Major: MSCS
   Advisor: Dr. Selena He

3rd place GR-12  Predicting Amazon Best-Sellers by Michael Kranzlein
   Major: MSCS
   Advisor: Dr. Dan Lo

Category: Undergraduate Capstone Project

1st place UC-19  KSU Go by Albert Lim, Anthony Schell, Chase Godwin, Dayton Chamberlin, Nick Wilson, Patrick Hilerio
   Major: BSCS
   Advisor: Dr. Selena He

2nd place UC-61  High Performance Caching of Data by Robert Montgomery, Dickson Diku, Macaulay Odinaka, Jared Wilson, Malcolm Frank, Abebe Adamu
   Major: BSSWE
   Advisor: Dr. Reza Parizi
3d place UC-54  IT Alumni Database ETL System by Ricky Parks, Vy Duong, Zack Downing, Desiree Smokes, Hang Yu  
Major: BSIT  
Advisor: Dr. Ming Yang

**Category: Undergraduate Research Project**

1st place UR-13  User Traffic Patterns Models by Nick Murphy, Devan Patel, Drew Savas, Derek Martin  
Advisor: Dr. Rongkai Guo

2nd place UR-04  Peak Shaving: Optimizing HVAC Cost by Derek Martin  
Major: BSCGDD  
Advisor: Dr. Michael Franklin

3d place UR-07  MS Office Macro Malware Detection by Ruth Bearden  
Major: BSCS  
Advisor: Dr. Dan Lo
# Spring 2018 C-Day Program

**April 26, 2018**

**Location:** Marietta Campus - J (Atrium) and I2 (Design 2) buildings

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT</th>
</tr>
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<tbody>
<tr>
<td>4:00 pm - 4:30 pm</td>
<td>Student check-in: J (Atrium) building 1st floor lobby followed by set-up: J (Atrium) building 3d floor (presenters only)</td>
</tr>
<tr>
<td>4:30 pm - 5:00 pm</td>
<td>Check-in judges, industry partners, Networking. Students, <strong>bring your resume.</strong></td>
</tr>
<tr>
<td>5:00 pm - 5:35 pm</td>
<td>Welcome from Dean Preston followed by Flash Session</td>
</tr>
<tr>
<td>5:35 pm - 6:20 pm</td>
<td>Judging of Student Projects Browsing</td>
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Return to the C-Day home page.

View the Spring 2018 C-Day winners.

Download the C-Day Flash Session Presentation.
6:20 pm - 6:50 pm  L2 (Design 2) Auditorium  
Pizza and Networking. Students, **bring your resume.**

6:50 pm - 7:00 pm  L2 (Design 2) Auditorium  
Recognition of Judges

7:00 pm - 7:30 pm  L2 (Design 2) Auditorium  
Presentation of Awards  
- Best Undergraduate Project  
- Best Graduate Project  
- Best Undergraduate Research Project  
- Best Graduate Research Project

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**Mark Your Calendar For Fall 2018 C-Day: Thursday, November 29 5-8pm**

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**Sponsor**  
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**Judges**

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**Academic courses undergraduate**

- Lynn Biester - Technology Innovation Sr. Manager, Georgia-Pacific Consumer Products, LLC
- Joe Cassavaugh - CEO/Designer/Engineer, Puzzles By Joe
- Bob Cole - Managing Director, Accenture
- Ryan Gibson - Associate Director - College Recruiting , AT&T
- Dana Graham - Director, IT, Georgia-Pacific
- Andrew Greenberg - Executive Director, GGDA/HDI
- Suneel Mendiratta - VP - Product Development, HRO, ADP
- D. Nguyen - Quality Assurance , Tripwire Interactive
- Evanda Remington - Director - R&D, Manhattan Associates
- Rushabh Shah - Principal System Architect, Pegasystems
- Bruce Skillin - Technology Innovator, Georgia-Pacific

**Academic courses graduate**

- Vladimir Rusanov - Development Manager, Stanley Black & Decker
- Peter Vennel - Director - Data Management, Safe-Guard Products Intl.
Undergraduate Research Projects

- Charles Igwilo - Partner, upSTART Venture Partners
- Dr. Hossain Shahriar - Assistant Professor of Information Technology, KSU
- Dr. Ming Yang - Professor of Information Technology, KSU

Graduate Research Projects

- Andrew Hamilton - CTO, Cybriant
- Frank L Ziller - CIO, Intelliteach

Guests

- Colin Malone - Senior Principal Business Analyst, Manhattan Associates
- Nancy McCrory - Software Development Manager, Automated Logic
- Laura Moore - Sr. Developer, UTC - CCS
- Jaspal Sagoo - CTO, CDC

Rubric and acceptance rate

137 project reviewed, 66 project accepted for presentation (48%).

Undergraduate and graduate projects: 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)
- Evidence of Rigor (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)
- Evidence of Rigor (10)

* Candidates for the best graduate research project award
* Project will be featured during the Flash Session

* UC-03 Ascension
  
  by Zachary Baker, Anthony Onukwuli, Nikki Ashaka
  
  Major: BAACS Advisor: Dr. Michael Franklin
  
  An archaeologist seeking ancient secrets plunges down an underground passage. As he attempts to find his way out, he stumbles upon a darkness that can be contained. In the inky depths of the cavern, he comes upon relics that contain the spirits of the Fallen Ones. Each of them, lamenting and contrite,
were helpless victims of the ruthless power they attempted to oppose. With the power of the relics, the lost excavator must free these tortured spirits from their bondage and redeem the sins of ancient evils.

- **+UC-05** Autonomous Robot Sim Using Unity
  by Christian Cho, Derek Martin, Jesse Manders, Christian Cho
  Major: BSCGDD Advisor: Dr. Michael Franklin
  Simulation of an autonomous mobile robot in a closed office environment using Unity. The simulation is realized as an actual autonomous real world robot. The project will utilize real world imaging from the robot integrated inside of the Unity environment. The simulation will also include modeling of sensors and the implementation of an artificial intelligence.

- **+UC-09** Hidden Opus
  by Jacob Jennings, Chris Regan, LaDarius DeShield, Richard Lago, Jacob Jennings
  Major: BSCGDD Advisor: Dr. Michael Franklin
  First person horror experience. Explore the ruins of a derelict town to unravel its mystery. Use only your camera in order to survive the night and discover the truth!

- **+UC-10** Neon Skyline
  by Erik Sheffer, Jacob Holloway, Jarrod Ariola, Hunter Jones
  Major: BSCGDD Advisor: Dr. Michael Franklin
  Neon Skyline is a fast paced, futuristic, and gritty racing game. In the year 2095, Adam Reeds is an ex-racer, who recently retired and escaped from the underground. He arrives home on New years to find his daughter kidnapped, with nothing left behind but a note, and a suspicious set of keys. With the help of his mechanic, Sam Rodgers, Adam Reeds will have to re-enter the racing scene, to find his daughter, and take her back. Neon Skyline features local multiplayer, procedural generated race courses, and crazy ramps and tracks to keep your heart racing as fast as the hover cars flying by you.

- **+UC-11** VR Bloodstream
  by Robert Forbes, Kalib Crone, Joshua Skelton
  Major: BSCGDD Advisor: Dr. Michael Franklin
  A Virtual Reality Experience that sends players into a virtual lab and bloodstream environment. The goal of the project is to teach students how to read and examine the bloodstream of different animals in order to determine when they are sick or irregularities are happening based on their bloodstream cell counts.

- **+UC-12** The Darkness Within
  by Nadia Khan, Haley Gagg
  Major: BSCGDD Advisor: Dr. Michael Franklin
  “The Darkness Within is the story of a young fox spirit who is attacked by darkness and falls from grace, waking up on Earth with no memory of its past. The Darkness now hunts the young sprite hoping to corrupt the spirit’s light and send the world into chaos. The light sprite must learn its purpose and purge the world of darkness.” The Darkness Within is a 3D platformer adventure game intended for children. The game is fantasy-based, but also teaches children simple physics as the game progresses.

- **+UC-14** EDP (Enterprise Delivery Planning)
  by Alexander Plattel, William Parish, David McFall, Clayton Hunsinger, Heather
Rego, Chasse Cossairt
Major: BSCS Advisor: Dr. Selena He
The purpose of EDP will be to offer a simple SAP interface for mobile devices which will allow users to update data in SAP in real time from their mobile device. We will be building the initial instance of this tool for an auto parts supply company called IMC and it will be a resource for truck drivers to register the items they deliver and the selected payment method and amount paid (although we will currently not be taking payments through the application).

*+UC-15 MenYou
by Austin Ford, Jackson Wessels, Miguel Toledo, Nathan Foshee
Major: BSCS Advisor: Dr. Yong Shi
Our project is an android application built on the Verifone Carbon 10 device. Our application is a menu management system that allows both customers and businesses to have the information of their menu at their fingertips. Our application allows businesses to create and manage their menu down to the details of the ingredients. Employees can search and filter the menu by specific ingredients and by name. This is useful for people with food sensitivities and food allergies.

*UC-16 Virtual Reality Locomotion
by Adam Hayes, Vojtech Martinek, Anderson McGee, Alex Kimbell
Major: BSCS Advisor: Dr. Yong Shi
Our project is a research project focusing on Virtual Reality (VR) Locomotion. We want to answer several questions regarding VR Locomotion, such as “Which locomotion do users find easiest to use”, and “With which locomotion do users maintain better spatial awareness”. We built a simulation using the Unity Engine to give users simple tests that will help answer those questions. We designed both an obstacle course for them to navigate and a simple room to test their spatial awareness.

UC-17 Wellstar IT Optimization
by Andrew Hubeli, Sarah Hansberry, Dante Taylor, Austin Barnett, Michael Little
Major: BSCS Advisor: Dr. Yong Shi
The Wellstar IT department receives upwards of 20000 tickets per month. The demand for IT services must be met while managing costs and resources. Many of the tickets could be resolved through automation or self-service.

*+UC-18 IoT Occupancy Tracking
by Alex Googe, Joshua Sanyika, Marc Wise
Major: BSCS Advisor: Dr. Selena He
The project uses two to four PIR motion sensors connected to a Raspberry Pi to detect motion going inside or outside of a doorway, hallway, etc. It then keeps a count of the number of occupants inside of the given room or area. The project also includes a web application that shows data in an easy to use manner for end users.

*+UC-19 KSU Go
by Albert Lim, Anthony Schell, Chase Godwin, Dayton Chamberlin, Nick Wilson, Patrick Hilerio
Major: BSCS Advisor: Dr. Selena He
The driving objective behind this project is to improve the student experience through a user friendly mobile app. Part of the problem with student involvement is poor communication of relevant information, and this app will be focused at presenting this in a visually pleasing, easy to access manner. We are going to create an app called KSU Go. It will be initially available to Android users and feature information about the campus, such as a campus directory, emergency services, D2L, Owl Life (clubs and organizations), Handshake (career planning), social feeds, campus map, and BOB (KSU bus) route tracking.

- **UC-22** IoT Smart Coffee Pot
  *by Brent Robinson, Justin Voorhees, Chip Gardner*
  Major: BSCS Advisor: Dr. Selena He
  Implementation of a smart coffee pot utilizing a raspberry pi, temperature sensor and load cell to display relevant data and notify others when a new pot of coffee is ready.

- **UC-23** NVidia CUDA in Bioinformatics
  *by Brent Robinson, Justin Voorhees, Chip Gardner, Victor Sahin*
  Major: BSCS Advisor: Dr. Yong Shi
  Analysis of a pairwise protein distance algorithm on an NVidia GPU using the CUDA API versus a serial implementation of the same algorithm.

- **UC-24** Pibble
  *by Nick Main, Charles Bryant, Sean Hale, Haley Bear, Mark Petell*
  Major: BSCS Advisor: Dr Selena He
  “Pibble” (the common nickname for pitbulls) is a chrome extension with the ability to scrape data websites to assist our sponsor, Labrador, it will also implement machine learning for the application to work on other sites. Labrador has sponsored this team to create an alternative to the manual method of data collection and entry currently used by their employees. The plugin solution includes the collection of data from two main sites: Edward's and Fortune's.

- **UC-26** Smart Pill Bottle
  *by Dylan Clark, Ben Davenport-Ray*
  Major: BSCS Advisor: Dr Selena He
  Creating a smart pill bottle that will allow a user to input his/her medication schedule and dosage then remind the user to take his/her medication at the correct time. It will also notify the user via push notification if he/she misses a dose.

- **UC-27** IoT Voice & Gesture Control System
  *by Deja Tyla Jackson, Zoe Cesar, Richmond Mensah, Nathaniel Klein, Amanda Norris, Khadijah Mahley*
  Major: BSCS Advisor: Dr. Selena He
  A gesture and voice recognition system that connects to AWS IoT core to publish a command. A robotic car is subscribed to the cloud and it receives the command and performs an associated action.

- **UC-28** “What's Next?!” Travel App
  *by Delia Sanders, Shivani Patel, Kevin Benitez Santos, Aniruddh Kathiriya, Dhruv Patel*
Major: BSCS Advisor: Dr. Yong Shi
Create a travel App that allows users to create a custom list with their desired locations of the chosen activities, based on the selected timeline. The app also provides a custom map for the user to reach the locations of their activities in the least amount of time.

- **+UC-30** Carbon Chain
  
  *by John Price, Nick Miller, Connor Armstrong, Alex Turner, Brandon Gonzalez*
  
  Major: BSCS Advisor: Dr. Yong Shi
  
  We have developed a loyalty point program that interfaces with the Verifone Carbon platform. This system was built using blockchain technology in order to create a reward system for their network of customers. We built the system as an API to be plugged into any existing application on the point of sale device. The demonstration application was built using android studio and the proprietary sdk for the device, and the backend was developed in NodeJS with Express.js, which was hosted on AWS’ cloud platform.

- **+UC-31** Smart Alarm Clock
  
  *by Jacob Stewart, Kurt Floyd*
  
  Major: BSCS Advisor: Dr. Selena He
  
  An alarm clock that dynamically alters wake up times based on current weather and traffic conditions, controls room lighting, tracks user sleep patterns, and suggests that an alarm be set if a user fails to set one during a normal time.

- **UC-34** FMSnote
  
  *by Mohamed Kabad, Shainu Vazhathil, Faisal Abdulkadir*
  
  Major: BSCS Advisor: Dr. Yong Shi
  
  Android application that merges three of the most utilized apps by students. The application, “FMSnote”, will merge Reminders, Notes and To-Do applications. The application helps the users track all the important dates and events in their every day lives.

- **UC-38** Rare Event Detection
  
  *by Rakeem Durand, Karim Rattani, Ihsan Hashem, Roberta Beaulieu, Thomas Fuller*
  
  Major: BSCS Advisor: Dr. Yong Shi
  
  Surveillance cameras have become a part of our life. We see them in almost every corner of the street and outside restaurants. However, hiring people to monitor all the surveillance video is expensive. The purpose of our project is to implement an algorithm that will detect abnormal activity such as robbery, accident, etc. and alert the corresponding authorities.

- **+UC-39** Virtual Education
  
  *by Sourav Debnath, Adi Vrskic, Andrea Pinardi, Jeffrey Dennis, Marc Wise*
  
  Major: BSCS Advisor: Dr. Selena He
  
  Our project aims to add the level of immersion in an online class, by developing a suite of virtual reality scenes simulating a real physical classroom environment, for the betterment and enrichment of a student’s education.

- **+UC-40** Verifone Support WebApp
  
  *by Srijan Kukkadapu, Ahmad Alissa, Dylan Clark, Kevin Burke, Josh Sisson*
Major: BSCS Advisor: Dr. Yong Shi
A WebApp for Verifone with an easy-to-use interface that answers questions that exist within the customer base of the company

- **UC-41** Visualization of Big Data with AR
  *by* Sean Saffan, Ronald Brooks, Victor Orellana, Matt Alyward (HS Intern)
  Major: BSCS Advisor: Dr. Sarah North
  Project Title: Visualization of Streamed Big Data Through Augmented Reality;
The purpose of this project is to design, develop and measure the effectiveness of an augmented reality (AR) application for the visualization of streamed data of network traffic. This application will be developed for the Microsoft HoloLens, with several AR models of data visualization to select from. The effectiveness of this application will be measured in an experiment.

- **UC-43** Bibliography Management Tool
  *by* William Patrick, Randolph Wilson, Michael Lin, Avery Snyder, Roberto Recinos
  Major: BSCS Advisor: Dr. Selena He
  A tool that will allow users to easily manage their cited sources when writing a paper, and generate a work cited page in MLA/APA format when they have finished writing their paper.

- **UC-44** Smart Baby Monitor
  *by* Taylor Bounds, Jayce Chen, Jordan Mateen, William Simmons, Bo Wang, Michael Wong
  Major: BSCS Advisor: Dr. Selena He
  A baby monitor connected to an android application that utilizes facial recognition to determine when the baby is waking up and alert the parents.

- **UC-45** KSU Capstone 15: SCADA Networks
  *by* Allen McCrory, Zivalus Nixon, Andrew Connelly, Chad Womble, Ashad Mahmood
  Major: BSIT Advisor: Dr. Ming Yang
  An analysis of the network architecture and vulnerabilities of supervisory control and data acquisition (SCADA) systems governing the daily operation of five sectors of critical infrastructure: water, energy, communications, transportation, and emergency management. Graphical models are used to demonstrate the network layouts of autonomous control systems and how they may be attacked.

- **UC-47** Moodle
  *by* Courtney Walker, Jessica Herr, Brian Luong, Adam Lee, Doutimi Azu
  Major: BSIT Advisor: Dr. Ming Yang
  The Distance Learning Center at Kennesaw State University is looking for an alternative to D2L in order to deliver its training programs to newly hired faculty. A previous Capstone group had already setup the Moodle server for testing. So, our goal for this semester has been to research and implement the various Reporting and Badge tools available in Moodle.

- **UC-50** CCSE Internship video blog
  *by* Juan Castro, Isaura Romero, Joe Black, Alexander Lam, Evgeniya Koganitskaya
  Major: BSIT Advisor: Prof. Dawn Tatum
  We are exploring the possibility of creating a website for internship students to
post video blogs/presentation about their internship experiences.

- **UC-53** How Immigration Affects Economics  
  *by Jack Matthews, Codi Sordelet, Jinhee Kim, Ebele Orakpo, Mahad Ahmed*  
  Major: BSIT Advisor: Dr. Ming Yang  
  A look at how immigration affects economics, examined through data visualizations of H1B visa statistics and economic indicators.

- **UC-54** IT Alumni Database ETL System  
  *by Ricky Parks, Vy Duong, Zack Downing, Desiree Smokes, Hang Yu*  
  Major: BSIT Advisor: Dr. Ming Yang  
  The IT department at KSU maintains an alumni database which stores graduates’ career information. In the past, alumni’s career information was manually extracted from LinkedIn.com and then loaded into a relational database which is a very labor-intensive process. In this project, we aim to create an automated extract, transform and load (ETL) system for the IT alumni database.

- **UC-55** Cyber Actor Profiles  
  *by Ramiz Ramic, Sabrina Buckholdt, Kevin Tillack, Hao Pham, Nick Kennelly*  
  Major: BSIT Advisor: Dr. Ming Yang  
  Research of cyber actor groups from: Eastern Europe, Asia, and Middle East. Develop profiles of each group’s activity to include motivations, techniques, tools, and procedures and favorite targets of attack. Video demonstration of a group’s typical attack against a favorite target.

- **UC-56** Cybriant SOC Portal  
  *by Ali Abdulelah, Cameron Fite, Zachary Auzenne, Brett Warner, Francisco Escalante, Arjumand Fatima*  
  Major: BSSWE Advisor: Dr. Reza Parizi  
  In a Security Operations Center there is a need to certify that a task has been performed for future auditing. Unfortunately, there are many different tools on the market and only moderate integration into ticketing or task management platforms. This means that it is difficult to quantify the time it takes for Security Analysts to perform tasks. The ability to certify (or at least recognize) that a task has been completed and the time it takes enables an organization help identify efficiencies as well as opportunities for further employee training.

- **M.A.I.D.A.S**  
  *by Andre Maxwell, Robert Torres, Gavin Smith, Adam Britton, Alex Creilson, Mariel McNeil*  
  Major: BSSWE Advisor: Dr. Reza Parizi  
  The purpose of our project is to use a drone in order to perform trailer yard auditing for our client, Manhattan Associates. We are to use to drone to capture the locations of trailers and their spots on a “yard” using a camera, and report the locations of those trailers to provide auditing of which trailers are on the yard and which parking spots or “docks” they reside in. This solution was asked to be deployed so that the manual labor that is required with performing manual yard audits would not longer be necessary, and the process of documenting the trailers and their locations on the yard would be streamlined.
*UC-58* Windows Forensics Suite  
*by Jessica Camilien, Joseph Blanco, David Klein, Justice Collier*  
**Major:** BSSWE Advisor: Dr. Reza Parizi  
A collection of tools that pull metadata from various locations in a Windows NTFS system and aggregate and display the data in a readable format. This allows the user to conduct a forensic investigation on a computer running Windows 8 or Windows 10.

*+UC-59* Roommates40Plus.com  
*by John Landsman, Ferit Akaybicen, Daniel Hanley, Daryan Sankar, Andres Rodriguez, Forrest Cain*  
**Major:** BSSWE Advisor: Dr. Reza Parizi  
Roommates40Plus.com is a dedicated website for older US citizens to find potential roommates. Generic forum websites such as Craigslist are looked down on by older citizens as a dangerous place for criminals and con artists. Roommates40Plus.com offers a safe and simple place for older generations to find like minded individuals to meet and potentially live with. This project was presented to us by Ms. Susan Asher, a Marietta local and owner of Roommates40Plus.com.

*UC-61* High Performance Caching of Data  
*by Robert Montgomery, Dickson Diku, Macauley Odinaka, Jared Wilson, Malcolm Frank, Abebe Adamu*  
**Major:** BSSWE Advisor: Dr. Reza Parizi  
Travelport is undertaking an effort to improve the way they cache inventory data using an in memory database during their search process. This project objectives are listed below: 1. Research technologies in the in-memory database space, and select a technology in which to build a proof of concept. (Technology chose: Pivotal GemFire) 2. Develop behavioral and non-behavioral requirements for a cache application that can scale to 100 billion requests per month at associated peak usage. 3. Design and develop a proof of concept application with the selected in-memory database technology, and demonstrate its ability to scale.

*UC-62* HealthQ  
*by Benny Villegas, Eddie Matos, Austin Harris, Zikomo Bullock, Stuart Tresslar, Brian Deguzis*  
**Major:** BSSWE Advisor: Dr. Reza Parizi  
The U.S. Centers for Disease Control and Prevention (CDC) has recognized that a need exists for a free, fast-to-learn, easy-to-use software solution that is designed around epidemiologists and their public health initiatives. HealthQ rises to the challenge with an application using Google's SDK and it's virtual voice intelligence, Google Assistant. The purpose of this project is to improve the quality of research the CDC is conducting while alleviating the hardships of researchers on the field. HealthQ's goal for their product is to help the CDC in their efforts to prevent disease, injury, and disability, promote health and well-being, and prepare for and respond to disasters. HealthQ believes they can aid in this efforts by analyzing data and drawing conclusions based on user prompted questions. HealthQ believes anyone should be able to conversant with their data.
* Candidates for the best graduate research project award
+ Project will be featured during the Flash Session

- **GC-02** Medical Image Classification
  * by Jessica Rudd
  Major: MSCS Advisor: Dr. Mingon Kang
  This project will compare traditional convolutional neural network (CNN) with the latest improvements to CNN technology known as CapsNet for improved medical image classification.

- **GC-05** 2018 Machine Learning Madness
  * by Beau Schmookler
  Major: MSCS Advisor: Dr. Mingon Kang
  Predict the 2018 March Madness Bracket using the annual Kaggle March Machine Learning Mania's combination of rich historical data and a variety of Machine Learning algorithms.

- **GC-06** Pedestrian detection by a robot
  * by Dane Hylton
  Major: MSCS Advisor: Dr. Mingon Kang
  Using the Raspberry Pi Smart Video Car Kit our aim is to detect pedestrians and classify them as either being stationary or moving.

- **GC-17** Statistical Analysis of NYC data
  * by Archana Joshi
  Major: MSIT Advisor: Dr. Meng Han
  Statistical Analysis of NYC taxi and Uber data to determine the popularity of the services and propose solutions to overcome the hurdles in service usage.

- **GC-19** Ethical hacking with Raspberry Pi
  * by Don Privitera
  Major: MSIT Advisor: Dr. Hossain Shahriar
  A Raspberry Pi is a tiny and inexpensive Internet of Things computer device that can be used as an ethical hacking tool. This project details proposed coursework as a basis for an advanced Ethical Hacking class at KSU as a follow-on the existing Ethical Hacking class. This work details procedures to stage KALI Linux on a Raspberry Pi device. In addition, this project details lab exercises to utilize the device for key ethical hacking lab exercises.

- **GC-21** Data Analytics with Python
  * by Abraham Kim
  Major: MSIT Advisor: Dr. Meng Han
  Data analysis using Python on massive data from https://world.openfoodfacts.org to compare the salt and sugar levels in organic foods and non-organic foods.

- **GC-22** PDF DExtractor
  * by Neal Hughart, Charlie So, Sarada Sundaresan
  Major: MSSWE Advisor: Dr. Reza Parizi
  PDF DExtractor is a web application that allows the end-user to upload a zip file to the website. The system then unzips the zip file and returns a random
Project will be featured during the Flash Session

*GC-55 House Prices- Regression Techniques
*+GR-09 Monitoring animals in wilderness
by Aakanksha Gupta, Aditi Kasat
Major: MSCS Advisor: Dr. Mingon Kang
A large data set with 79 different features (like living area, number of rooms, location, etc.) along with their prices are provided for residential homes in Ames, Iowa. The challenge is to learn a relationship between the important features and the price of the home and then use the above relationship to predict the prices of a new set of houses. The goal for the project is to predict the sales price for each house(1d).

* Candidates for the best graduate research project award
+ Project will be featured during the Flash Session

GR-02 K-Nearest Neighbor on Hadoop
by Arai Chapa, Daniel Brown
Major: MSCS Advisor: Dr. Yong Shi
For this research, we implemented the K-Nearest Neighbor algorithm in a MapReduce paradigm and tested it on a Hadoop cluster.

GR-03 Clustering Algorithms for MapReduce
by Daniel Brown, Arai Chapa
Major: MSCS Advisor: Dr. Yong Shi
An implementation of big data clustering algorithms for use with the MapReduce framework and Apache Hadoop.

GR-06 Malware Classification by ML & LBP
by Jiu-Sin 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 its binary image and extracting local binary pattern (LBP) features is proposed. First, hexadecimal malwares are converted into RGBA scale image and reorganized into 3 by 3 grids which is mainly used to extract LBP feature. Second, the 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 images with the LBP feature. Performance comparison results among different classifiers with different image descriptors such as GIST, a spatial envelop, and the LBP demonstrate that our proposed approach outperforms others.
The purpose of this research is first to be able to localize animals in wilderness using live camera feeds. Then, using the existing techniques (Convolutional Neural Network) detect each animal, count for each species and identify the behavior at the moment. The behavior here is considered as either standing, not standing, resting or not, eating, baby. Nonetheless, a recent paper from Geoffrey Hinton, have proven some shortcomings of the state-of-the-art convolutional neural network to detect objects. Indeed, he proposed a new model of network called the Capsule network that is supposed to overcome the shortcomings of the CNN. The main objective of this research is to be able to achieve this task using CNN and Capsule Network.

- **+GR-12** Predicting Amazon Best-Sellers  
  *by Michael Kranzlein*  
  Major: MSCS Advisor: Dr. Dan Lo  
  A multiple classifier system of neural networks built on Amazon product descriptions and images for predicting best sellers across a variety of product categories.

- **GR-16** Training a Neural Network to Walk  
  *by Oscar Garcia*  
  Major: MSCS Advisor: Dr Selena He  
  Using a novel neural network architecture navigate an arena to reach a target. This is an implementation step towards achieving an architecture capable of solving insight class problems (the ability to synthesize solutions to a novel problem without training those solutions).

- **GR-18** R-CNN for Gender Identification  
  *by Rehnuma Afrin*  
  Major: MSCS Advisor: Dr. Mingon Kang  
  R-CNN (Region based Convolutional Neural Network) is very effective for object detection and localization. It takes in an image, and correctly identify the objects in the image via a bounding box. In this project, R-CNN is used for Gender detection and classification.

- **GR-20** Algorithms to Improve MRI Scanning  
  *by Srivarna Settisara Janney, Dr. Sumit Chakravarty*  
  Major: MSCS Advisor: Dr. Chih-Cheng Hung  
  Applying three new algorithms in Compressed Sensing to Medical images (MRI) such as Brain, Chest, Shoulder, and Heart type of image data sets, offers significant scan time reductions, which benefits patients, at the same time retains quality images for accurate diagnoses by radiologist.

- **GR-24** Object Tracking with OpenCV  
  *by Tao Wu, Nisha Desai*  
  Major: MSIT Advisor: Dr. Ming Yang  
  In this project, we utilize template matching and OpenCV library to enable object tracking. We have applied different search window size and template dimension to achieve the best matching precision and performance.

- **GR-26** Deep Embedding Kernel  
  *by Linh Le, Linh Le*  
  Major: PHD Data Science Advisor: Dr. Ying Xie
In this poster, we propose a novel supervised learning method that is called Deep Embedding Kernel (DEK). DEK combines the advantages of deep learning and kernel methods in a unified framework. More specifically, DEK is a learnable kernel represented by a newly designed deep architecture. Compared with pre-defined kernels, this kernel can be explicitly trained to map data to an optimized high-level feature space where data may have favorable features toward the application. Compared with typical deep learning using SoftMax or logistic regression as the top layer, DEK is expected to be more generalizable to new data. Experimental results show that DEK has superior performance than typical machine learning methods in identity detection, classification, regression, dimension reduction, and transfer learning.

- **GR-27** Fault Detection in IoT using DL  
  *by Sergiu Buciumas*  
  Major: PHD Data Science Advisor: Dr. Dan Lo  
  With current increasing attacks for the industrial systems, traditional machine learning models are able to only find the malicious activity at the communication level and the binary level. With the increasing success of the Deep Neural Networks we present method from DL to solve the problem. This paper provides a comparative analysis of the current sequence-to-sequence based on an LSTM neural network to monitor and detect faults in industrial multivariate time series data. We know that the current area with high security concerns is the IoT, and in special the cyber-security for industrial processes. We provide in this paper results of the current state of the art models used for fault detection and also bring an improvement model from multivariate time series in order to solve current challenges. The data used into the research paper is a real gasoil plant.

- **GR-28** Comparison of forecasting methods  
  *by Shashank Hebbar*  
  Major: PHD Data Science Advisor: Dr. Mingon Kang  
  Will compare LSTM Neural networks with traditional time series methods in forecasting web traffic for wikipedia pages

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**Undergraduate Research (7)**

- **UR-02** Self-Schooling Tablet  
  *by Pauline Sawadogo*  
  Major: BSIT Advisor: Prof. Diana Rabah  
  The “Self-Schooling Tablet” is designed to be used as a learning support device for the millions of out of school children. The self-Schooling Tablet is connected to two trays. Starting from the bottom, the first tray contains sand. The second tray is of two folds, the first is a homework sheet with markers & pencils container and the second is a white board. Beginners, starts with watching video lessons on the tablet, follow instructions, and practice writing on the sand, the white board and then completing homework sheet for mentors to review. Advanced learners will watch videos or PowerPoint lessons, practice on white board if applicable and then complete homework for
mentors to review.

- **UR-04** Peak Shaving: Optimizing HVAC Cost  
  *by Derek Martin*  
  Major: BSCGDD Advisor: Dr. Michael Franklin  
  We developed a simulation, of a typical day at West Point Academy, and a predictive model to attempt to optimize the efficiency of their A/C system during peak hours of the day (when a large amount of students return to their dorm room after class or extracurricular activities). In other words, we attempted to develop a model that will preheat or pre-cool the rooms of the residents, to satisfy the residents, while also reducing the workload/cost of running the HVAC system.

- **UR-06** Animal Detection Using R-CNN  
  *by John Jajeh, Masood Abdul Salam*  
  Major: BSCS Advisor: Dr. Mingon Kang  
  By applying regions on CNN features, R-CNN provides computer vision solutions for multiple-object detection. In our research, we are utilizing AlexNet's pre-trained model in the Caffe framework to detect approximately 400 different animal species and are acclimating this work from KSU's GPU server to the Android environment. After an individual downloads the application and an animal is detected, he/she can click on the animal, which will prompt Google to search the animal label. Essentially, this app will allow users to photograph unfamiliar (or familiar) animals for identification and better personal understanding.

- **UR-07** MS Office Macro Malware Detection  
  *by Ruth Bearden*  
  Major: BSCS Advisor: Dr. Dan Lo  
  Macro malware hidden in Microsoft Office files still poses a threat to cyber security two decades after its emergence. This research seeks to increase macro malware detection accuracy by using machine learning techniques to improve common approaches to the problem.

- **UR-08** Interaction Humanoid Robots/Humans  
  *by Joel Tedo, Ben Tamo, Matt Alyward (High School Intern)*  
  Major: CS Advisor: Dr. Sarah North  
  Project Title: Interaction between Humanoid Robots and Humans in Collaborative Environments; One of the most challenging areas of robotics research is in the cooperation between humans and machines. The main objective of this research is to investigate the interaction between humanoid robots and humans in collaborative environments. Two UXA-90s, Multipurpose Humanoid Robots (MHRs) with Scratch Builder software (RQ Robot Coding software) are used in two distinct experiments. The first experiment measures unambiguous task completion and accurateness by two MHRs working together, while the second experiment measures unambiguous task completion and accurateness by an MHR and human working together. Preliminary pilot experimentation and observations are encouraging. A comprehensive interface and experimentation are under development, and collected data are subjected to a battery of statistical analysis procedures, including ANOVA and t-test. Conclusions are derived and reported accordingly.
- **UR-10** Cryptocurrency Sentiment Analysis  
  *by Nusrat Sultana*  
  Major: BSIT Advisor: Dr. Meng Han  
  Analyzing social media data (Twitter, Reddit) to predict the price rise/down for cryptocurrencies such as Bitcoin and Ethereum.

- **UR-13** User Traffic Patterns Models  
  *by Nick Murphy, Devan Patel, Drew Savas, Derek Martin*  
  Major: MSCS & BSCGDD Advisor: Dr. Rongkai Guo  
  In this phase of our research, we have developed a method for modeling the shape and size of “walkable” pathways of an environment based on traffic data collected from Bluetooth beacons in that area.