College of Computing and Software Engineering / Computing Showcase /
Spring 2018 C-Day Winners

Spring 2018 C-Day Winners

Category: Graduate Capstone Project

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

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

<u>3d place</u> GC-02 Medical Image Classification by Jessica Rudd
Major: MSCS
Advisor: Dr. Mingon Kang

Category: Graduate Research Project

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

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

<u>3d place</u> GR-12 Predicting Amazon Best-Sellers by Michael Kranzlein
Major: MSCS
Advisor: Dr. Dan Lo

Category: Undergraduate Capstone Project

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

<u>2nd place</u> 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

<u>3d place</u> 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

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

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

<u>3d place</u> UR-07 MS Office Macro Malware Detection by Ruth Bearden
Major: BSCS
Advisor: Dr. Dan Lo

Contact Info

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Spring 2018 C-Day Program

April 26, 2018

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

C-Day Home Page

Return to the C-Day home page.

Spring 2018 Winners

View the Spring 2018 C-Day winners.

Flash Session Presentation

Download the C-Day Flash Session Presentation.

TIME	EVENT
4:00 pm - 4:30 pm J (Atrium) building 1st & 3d floors	Student check-in: J (Atrium) building 1st floor lobby followed by set-up :J (Atrium) building 3d floor (presenters only)
4:30 pm - 5:00 pm J (Atrium) building 1st floor lobby	Check-in judges, industry partners, Networking. Students, **bring your resume**.
5:00 pm - 5:35 pm I2 (Design 2) Auditorium	Welcome from Dean Preston followed by Flash Session
5:35 pm - 6:20 pm **J (Atrium) building 3d floor**	Judging of Student Projects Browsing

6:20 pm - 6:50 pm I2 (Design 2) Auditorium	Pizza and Networking. Students, **bring your resume**.
6:50 pm - 7:00 pm I2 (Design 2) Auditorium	Recognition of Judges
7:00 pm - 7:30 pm I2 (Design 2) Auditorium	Presentation of Awards - Best Undergraduate Project - Best Graduate Project - Best Undergraduate Research Project - Best Graduate Research Project

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

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Judges —

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)

Academic courses undergraduate (e.g. capstones, games, innovative special topics projects, other course projects) (39)   —

* 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 plummets 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 Gragg
  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 a 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 Srija 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.

- ***+UC-57** 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.

Academic courses graduate (e.g. capstones, games, innovative special topics projects, other course projects) (8)

* 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

PDF form from a stack of PDF forms within the zip file. The end-user selects the text and format of the destination file that they would like the system to extract for all of the PDF forms in the zip file. The end-user is then given the option to save the selection coordinates for future use if they have created an account on the PDF DExtractor web site.

- ***GC-55** House Prices- Regression Techniques
  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(Id).

Graduate Research (12)

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

- **GR-02** K-Nearest Neighbor on Hadoop
  by Arialdis Japa, 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, Arialdis Japa
  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 Jhu-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.

- ***+GR-09** Monitoring animals in wilderness
- *by Joel Kamdem Teto*
  Major: MSCS Advisor: Dr. Ying Xie

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

Undergraduate Research (7)   —

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

- ***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.

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