College of Computing and Software Engineering / Computing Showcase /
Spring 2023 C-Day Winners

Spring 2023 C-Day Winners

GPC/Napa Graduate Award

GC-382 Artificial Intelligence(AI) for Quantitative Trading (Graduate Capstone) by Akpan, Winifred; Ayo, Emmanuel; Kennedy, Jason; Browning, Malek;

The GPC/NAPA C-Day Award 1

Abstract: This project involves the use of Artificial Intelligence (AI) and Machine Learning (ML) techniques in quantitative trading and stock market analysis for educational purposes. The goal of this project is to predict stock market movement to help investors mitigate risks associated with trading and to provide higher returns. It involves the use, implementation, and refinement of basic python framework codes, sklearn library (pandas and numpy), in addition to the development and application of a Linear Regression labeling strategy to predict future daily stock trends, and the utilization of a Supervised Learning AI model. The techniques developed and utilized during this project will be used to analyze market trends, predict market movements, and optimize investment strategies. This project will provide knowledge and practical skills in AI, ML, and quantitative trading.
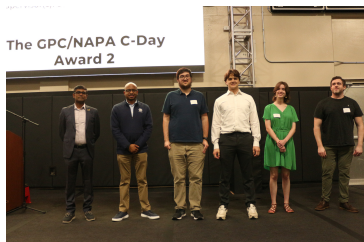
Department: Information Technology
Supervisor(s): Dr. Ying Xie
Topic: Data/Data Analytics
Presentation | Poster | Website

GPC/NAPA Undergraduate Award

UC-338 Chiba (Undergraduate Capstone) by Fushimi, Aidan; Autry, Johnathon R; Miller, Mikail S; Buell, Katelyn;

The GPC/NAPA C-Day Award 2

Abstract: The core mechanic present in Chiba is pushing around food items to plate tiles. Each time the player pushes a food item it incurs a cut. With enough cuts the food item will be cut into pieces, progressing to the next cut "stage" - with a max stage of cuts available for the different pieces of food. This is fundamentally built upon the core gameplay mechanic in Sokoban. Additionally, extending upon this further by incorporating new mechanics such as grilling food items and utilizing slick and sticky tiles.

Together, these mechanics allow for a unique series of puzzles to test the players' spatial reasoning. Furthermore, players are disallowed from pushing any one piece of food too many times because the food crumbles and breaks after a certain point. This causes them to be forced to restart the level. Players need to balance both navigation and finding the shortest possible paths in order to push the food to the plates to complete the level. If players complete a level in under a certain number of moves, they can earn a star for that level. Players can earn up to three stars per level if they make the minimum number of pushes possible. As the levels progress, more mechanics are added to give players more ways to solve levels. For example, meatballs were added that rolled until they hit something instead of moving a single tile. With additional mechanics like rolling, players are introduced to more complicated levels that allow them to consider more solutions, while also restricting other solutions.

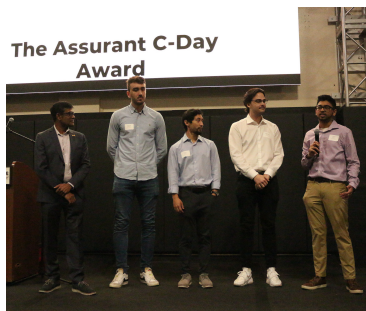Department: Software Engineering and Game Design and Development

Supervisor(s): Dr. Henrik Warpefelt

Topic: Games

Presentation | Poster | Website

Assurant

UC-344 WiseWallet (Undergraduate Capstone) by Patel, Sagar; Berdyna, Shpetim; Nuqui, Ethan R; Curca, Sebastian;

The Assurant C-Day Award

Abstract: WiseWallet is designed to help users manage their finances in a simple and intuitive way. The app provides an easy-to-use interface for tracking income, expenses, and savings, allowing users to set goals and monitor their progress towards achieving them. The app also features customizable categories and budgets, enabling users to tailor their budgeting approach to their individual needs and preferences. In addition, the app provides visual aids such as charts and graphs to help users better understand their spending patterns and make informed financial decisions. With its user-friendly interface and powerful features, the Flutter mobile app for budgeting is an ideal tool for anyone looking to take control of their finances and achieve their financial goals. WiseWallet is a mobile application designed for both iOS and Android platforms, utilizing Flutter and Dart technologies for its development. The app integrates Firebase as a back-end service to manage the flow of data to and from the app. Additionally, Plaid, a third-party financial technology provider, is incorporated into the app to enable users to connect their bank accounts with WiseWallet.

Department: Computer Science

Supervisor(s): Prof. Sharon Perry

Topic: Mobile Application

Presentation | Poster | Website

1st place Undergraduate Research

UR-390 BactiFind: A Novel CNN-based Framework to Classify Bacterial Species (Undergraduate Research) by Lowhorn, Ryan; Cardwell, Zac;

Abstract: Abstract—Bacterial species identification is an essential step in diagnosing diseases caused by bacterial attacks. Effective prescription to cure these diseases depends on accurate bacterial species identification. Faster identification along with accuracy is essential because some bacteria grow fast in the human body. However, bacterial species classification using a laboratory environment through traditional approaches is time-consuming, and it depends on human expertise, which is not immune to human error. Well-trained and experienced microbiologists demonstrate the probability of preparing bacterial species identification reports with lower error rates. However, hiring experienced microbiologists is expensive. Convolutional Neural Network (CNN)-based automatic bacterial species classification system is a potential innovative alternative to traditional laboratory methods, which is faster and cheaper. However, there are multiple challenges associated with developing a CNN-based bacterial species classifier. This paper proposes an innovative CNN-based framework, BactiFind, to overcome the obstacles and automatically identify 33 different bacterial species and generate reports for physicians. It classifies bacterial species with 96.42% accuracy, 97.13% precision, 97.25% recall, and 3.58% error rate. The well-optimized network architecture, innovative bypass layer, and effective image augmentation method have facilitated this outstanding performance which has been further validated using state-of-the-art CNN evaluation methods. Index Terms— Bacterial species classification, Convolutional Neural Network, image augmentation, network optimization, bacterial image transformation.
Department: Computer Science
Supervisor(s): Dr. Md Abdullah Al Hafiz Khan, Dr. Yong Shi
Topic: Artificial Intelligence
Presentation | Poster | Website

1st place Graduate Research

GR-358 Impact of Avatar's Behavioral Change with Quantity on Human Perception in Immersive Experiences (Graduate Research) by Wile, Nicholas L;

Abstract: As virtual reality technology evolves, researchers have found that the characteristics of virtual avatars including appearance, representation, and proximity, can

significantly influence the immersive experience of the user. This project investigates the impact of the number of avatars and their behavioral influence on the user in a simulated learning environment. We developed a virtual reality classroom system with Unity designed to elicit, track, and record the user's behavioral changes including eye gaze, head, and hand movement using HTC VIVE Pro Eye and physiological signals including Heart Rate (HR) and Galvanic Skin Response (GSR), while the user delivers presentations to classrooms full of varying numbers of avatars. During the presentation, a fixed percentage of randomly chosen avatars perform an abnormal behavior, either a change in eye gaze or head movement. We hypothesized that the influence of this abnormal behavior on the user will be exponentially greater when the total number of avatars is larger, even though the percentage of avatars performing the abnormal behavior relative to the total number of avatars is held constant. In our research, we explore this phenomenon and use the results to design guidelines for the social VR experience.

Department: Software Engineering and Game Design and Development

Supervisor(s): Dr. Sungchul Jung

Topic: Games

Presentation | Poster | Website

1st place Undergraduate Capstone

UC-315 Cybersecurity Analysis of Password Managers (Undergraduate Capstone) by Harris, Marshall; Dees, Tyler; Eckelberry, Justin; Sprague, Thomas; Gutierrez, Jared;

Abstract: As the ubiquity of password managers has increased so too has the incentive for malicious actors to compromise them. This project's purpose is to investigate password manager software for potential security vulnerabilities. The team chose, researched, and probed a popular password manager for weaknesses. Multiple attack vectors for cracking the security of the software were discovered. The most promising of these vectors were, one, the usage of malicious extensions for Internet browsers to circumvent the security of the password manager software which often interfaces with said browsers for user convenience, and two, the deployment of a malware disguised as an update for the password manager.

Department: Information Technology

Supervisor(s): Prof. Donald Privitera

Topic: Security

Presentation | Poster | Website

1st place Graduate Capstone

GC-345 BrainNet: Using Deep Learning to Classify Brain Tumors (Graduate Capstone) by Deem, Ryan;

Abstract: Brain tumors are a common type of cancer, and they do not discriminate based on gender, age, or ethnicity. That said, the severity and type of tumor vary among the diagnosed individual, cancerous or benign. The three most common types for diagnosed individuals are glioma, meningioma, and pituitary. Even so, identifying the type of tumor can be an arduous process for both the doctor and the patient, but one technique known as Convolutional Neural Network (CNN) has been particularly effective in expediently and reliably determining the type of brain tumor. A CNN is a type of neural network that can independently extract imaging features (e.g., face shape, eye color of images of faces), one of these models is known as ResNet101, which contains several residual layers. Through these layers, data can be spread forward, and retain information about the findings of the patient's images. The ResNet model layers were frozen in this case for the first 10 epochs, then when the model had 50 of the layers of the base unfrozen which resulted in the training accuracy being 98% after 10 more epochs and the test accuracy being 96% after it finished. The conclusion drawn is that the results mean that they have shown that they have better than most existing models for this application, due to that a majority of models can only achieve the low 90%.
Department: Computer Science
Supervisor(s): Dr. Md Abdullah Al Hafiz Khan
Topic: Artificial Intelligence

Presentation | Poster | Website

2nd place Undergraduate Research

UR-369 Classifying Chest X-Rays of Pneumonia Using Transfer Learning (Undergraduate Research) by Swann, Michael B; Clark, Noah;

Abstract: Convolutional neural networks are a powerful tool in machine vision when it comes to identifying patterns. Considering the importance of identifying patterns in medical imaging, there is a great opportunity to develop effective CNN models to analyze medical imagery. Furthermore, the introduction of transfer learning has introduced the opportunity to develop models which are more accurate and better generalize to other datasets.

Therefore, we explore the efficacy of different CNN models with respect to a dataset regarding X-ray imaging for pneumonia. We do this through using transfer learning models and demonstrate that pretrained models outperform models which are trained only on the dataset available. We also highlight additional methods which could be expanded upon in future research and hope to develop a state-of-the-art model for this particular dataset in the final version of this paper.

<u>Department</u>: Computer Science

<u>Supervisor(s)</u>: Dr. Md Abdullah Al Hafiz Khan

Topic: Artificial Intelligence

[Presentation](#) | [Poster](#) | [Website](#)

2nd place Graduate Research

GR-343 An Experimental Study: Performance of Load Balancing Algorithms in SDN-Enabled Cloud Computing Networks (Graduate Research) by [Challagundla, Samhitha](#);

<u>Abstract:</u> To meet the requirements of modern IT, it is crucial to address the numerous limitations of current cloud computing networking infrastructures. One promising solution to overcome these constraints is Software Defined Networking (SDN). SDN is an innovative networking approach that utilizes software-based controllers or APIs to manage and direct network traffic on top of underlying hardware infrastructure. SDN plays a major role in Cloud Computing in that it allows users to address different changes quickly as they come. One of its major advantages is that it streamlines the network configuration procedure and boosts network monitoring and performance. This study aims to implement various load-balancing algorithms for SDN to analyze the network performance. The implementation uses the POX controller as an SDN controller and Mininet software to emulate the network. The load-balancing algorithms are programmed using Python, which is also employed to create the network topology. The findings demonstrate that the Weighted Round Robin algorithm outperforms all the other algorithms that were evaluated.

<u>Department</u>: Computer Science

<u>Supervisor(s)</u>: Dr. Ahyoung Lee

Topic: IoT/Cloud/Networking

[Presentation](#) | [Poster](#) | [Website](#)

2nd place Undergraduate Capstone

UC-318 Capstone Cybersecurity Website Hardening Group 2-01 (Undergraduate Capstone) by [Lewis, Sean A](#); [Greco, Blair C](#); [Heard, Rontavious A](#); [Moser, AJ](#);

Abstract: The project we were given by Professor Privitera is to secure a web server that is a simulation of a genuine business with our case being a restaurant known as Akwaaba. The business website is hosted on Apache, MariaDB, Red Hat Linux, and PHP. We will first need to explore the network we were given to determine the system's weaknesses to evaluate the risks and create a proper security policies plan with the help of the National Institute of Standards and Technology (NIST) standards. Following the security plan we created, our group will implement these changes into the network, hardening them to these standards. Finally, we will participate in a red/blue team cybersecurity ethical hacking procedure with our network and the two other teams. We will use white hat hacker skills to gain access to other groups' networks while protecting our own network by patching up weaknesses if they have been breached.
Department: Information Technology
Supervisor(s): Prof. Donald Privitera
Topic: Security
Presentation | Poster | Website

2nd place Graduate Capstone

GC-337 Analysis of Alternatives for Workstation Deployment for GTRI (Graduate Capstone) by Freeman, Josh; Glaze, Kevin; Curtis, Doug; Dougal, Kayla; Allam, Rakesh;

Abstract: Georgia Tech Research Institute is requesting an analysis of alternatives of workstation deployment solution that can deploy an operating system to a workstation. This deployment solution must at least be able to deploy Windows 10, Windows 11, Red Hat Enterprise Linux 8 and 9; support multiple users simultaneously, support various models, and run custom scripts. The objective of the analysis of alternatives is to provide Georgia Tech Research Institute with one deployment solution that can replace their current software that facilitates this process. There are inefficiencies to resolve in their current environment such as deploying various operating systems and applying packages, updates, and applicable security policies. This multi-step process takes time to attain the desired outcome. By providing an alternate solution, it is foreseeable to provide cost savings along with overall efficiency to Georgia Tech Research Institute.
Department: Information Technology
Supervisor(s): Dr. Zhigang Li
Topic: Enterprise Systems
Presentation | Poster | Website

Third Place Winners

3d place Undergraduate Research

UR-379 Combatting Data Heterogeneity in Federated Learning (Undergraduate Research)
by Hutchison, Andrew J; Bull, Justin C; Cummings, Aaron;
Abstract: The growing concern in data privacy has led to new paradigms in Machine
Learning primarily focused around keep data safe and secure. In our research project, we
studied Federated Learning, specifically utilizing knowledge distillation and an autoencoder
in an attempt to create a sustainable model that could be used in a field such as Heathcare.
We propose a Federated Model using the Flower framework, trained on the MedMNIST2D
dataset (Organ(A/C/S)MNIST), using Knowledge Distillation as a method of sharing the
global model, and a Variational Autoencoder to deal with the problem of Data Heterogeneity
that can arise on a distributed network. Our results on a cumulative model are tentative but
hope to prove that the idea can be utilized in networks with varying sizes of edge device,
usage, and types.
Department: Computer Science
Supervisor(s): Prof. Sharon Perry, Dr. Xinyue Zhang
Topic: Artificial Intelligence
Presentation | Poster | Website

3d place Graduate Research

**GR-389 Molecular Dynamics and Protein-Protein Interactions (PPIs) on SARS-CoV-2
coronavirus** (Graduate Research) by Addepalli, Durga Narayana Varma;
Abstract: The objective of this comparative analysis is to study the behavior of the Original,

alpha, beta, gamma, delta, and omicron variants of SARS-CoV-2 coronavirus under conditions that resemble the human body. To achieve this, we conducted Molecular Dynamics simulations for all variants in the same environment. Additionally, we conducted salt bridge and hydrogen bond analyses to further investigate the behavior of the SARS-CoV-2 variants. These analyses allowed us to examine the interactions between amino acid residues and to determine the stability of the protein structures. By integrating these analyses with our Molecular Dynamics simulations, we were able to gain a comprehensive understanding of the behavior of each variant in a human-like environment. This information could be crucial in developing effective treatments and vaccines against COVID-19. Overall, our study provides valuable insights into the molecular dynamics and protein-protein interactions of the SARS-CoV-2 variants and highlights the importance of further research in this area to combat the ongoing pandemic.
Department: Information Technology
Supervisor(s): Dr. Chole Yixin Xie
Topic: Data/Data Analytics
Presentation | Poster | Website

3d place Undergraduate Capstone

UC-364 Step Up (Undergraduate Capstone) by Hardage, Liam K; Iqbal, Sami; Guerrero Bengoa , Emely P; Okwuosa, zachary; Hemphill, Kennedy;
Abstract: Step Up is a website designed to let users enter their information and calculate a step count to aid them in losing weight. Each user creates an account to store their data. This information will include necessary variables to calculate their step count using their target weight loss. The step count provided by Step Up considers the number of steps a user between the ages of 19 to 40 must make over three months to reach their goal. Step Up allows users to receive email reminders to keep their information up to date. Administrators of Step Up have the option to download anonymous user data for further research into the method behind Step Up's calculations.
Department: Software Engineering and Game Design and Development
Supervisor(s): Dr. Yan Huang
Topic: Software Engineering
Presentation | Poster | Website

3d place Graduate Capstone

GC-340 AI for Quantitative Trading (Graduate Capstone) by Ponakaladinne, Kiran; Binigari, Sai Charan; Jawale, Mayuri; Petakamsetti, Gowthami; Agarwal, Nihal Kumar;
Abstract: AI for quantitative trading involves using machine learning and other AI techniques to analyze financial data and make informed trading decisions. By automating

the trading process and leveraging the power of AI, traders can potentially improve their performance and generate better returns. The goal is to identify and capitalize on available trading opportunities by using computer algorithms and programs based on simple or complex mathematical models. Stock market indicators are statistical measures that provide insights into the behavior of the stock market as a whole or of individual stocks. These indicators are used by investors, traders, and analysts to evaluate market trends and conditions, predict future price movements, and make informed investment decisions. After establishing an understanding of these indicators and performance metrics, one can understand the process of developing a trading simulator, strategy optimizer, and financial machine-learning pipeline. Multiple trading strategies are implemented systematically and adapted to real-time market conditions using machine learning. Stock movement is predicted by supervised models to demonstrate how machine learning can be applied to quantitative trading. In addition, multiple optimization techniques are used in trading to maximize returns and minimize risk. Several machine learning techniques and methodologies like feature selection are used to find accurate prediction.

<u>Department</u>: Information Technology

<u>Supervisor(s)</u>: Dr. Ying Xie

Topic: Artificial Intelligence

[Presentation](#) | [Poster](#) | [Website](#)

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College of Computing and Software Engineering / Computing Showcase /
Spring 2023 C-Day Program

Spring 2023 C-Day Program

Thursday, April 27th, 2023

Location: Marietta Campus - Gymnasium

C-Day Home Page

Return to the C-Day home page.

Spring 2023 Winners

View the Spring 2023 C-Day winners.

Flash Session Presentation

Download the C-Day Flash Session Presentation.

TIME	EVENT
3:30 - 4:00 pm	Student check-in
4:00 - 4:30 pm	Check-in judges, industry partners, Networking. Students, **bring your resume**.
4:30 - 5:00 pm	Welcome from the IT Department Chair Shaoen Wu followed by Flash Session
5:00 - 6:20 pm	Judging of Student Projects Browsing
6:20 - 6:40 pm	Pizza and Networking. Students, **bring your resume**.
6:40 - 6:50 pm	Dawn Tatum: Recognition of Judges

6:50 - 7:10 pm	GPC/NAPA Keynote Speaker
7:10 - 7:30 pm	Dean Yenduri: Presentation of Awards ○ GPC/NAPA Award ($1000 for winning team) ○ GPC/NAPA Award ($1000 for winning team) ○ Assurant Award ($600 for winning team) ○ CCSE Outstanding Student Awards ○ Best Undergraduate Project ($600 for winning team) ○ Best Graduate Project ($600 for winning team) ○ Best Undergraduate Research Project ($600 for winning team) ○ Best Graduate Research Project ($600 for winning team)

Sponsors

Spring 2023 Presentations

Judges —

Brian Woods – 402d Software Engineering Group
Daniel Omuto – Accenture
Keith Tatum – Allen Media Group
Alla Kemelmakher – Amdocs, Inc.
Amer Uttamchandani – Assurant
Darrell Washington – CGI
Ryan Moser – CGI
Shelby Silcox – Cox Automotive
Phoenix Sink – Cybriant
Issouf Kindo – DataSeers, Inc.
Soin Kassif Traore – DataSeers, Inc.

Abdoul Kassif Traore – DataSeers, Inc.
Juan Huaca – FIS
Keith F. Mosley Jr. - Genuine Parts Company
Kevin Osborn – Genuine Parts Company
Alycia McCarty – Genuine Parts Company
Andrew Greenberg – GGDA/GTH
Michael Parlotto – InComm Payments Go Studio
Scott Robinson - IngeniousMed
Tsai-Tien Tseng – KSU
Tyler Reinagel – KSU
William Forsyth – KSU
Julie Kimball – KSU Foundation
Len Greski – LeadingAgile LLC
Bill Lorton – Lighstorm Entertainment
Felipe Alequin – N-able
Raj Despande – Pulseworks
Taylor Meyers – Pulseworks
Valdimir Rusanov – Stanley Black & Decker, CribMaster
Dorren Schmitt – The Weather Channel
George McBroom – US Army Corps of Engineers
Md Arabin Islam Talukder – Walmart, Inc.
Jim Kimball

:

Best Project in Each Category Rubric

Undergraduate and graduate projects: scale 0- 10with 0representing "Poor" and 10representation "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 (0-10)
- Merit and Broader impact (0-10)

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

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

Alumni's Choice Award Rubric

Alumni Judges will judge the Undergraduate Capstone projects to determine the "best" from those presented.   Undergraduate Capstone Project titles start with the letters "UC –" on their poster.

1. Team Approach: 20 pts (did the team work together effectively to meet goals)
2. Presentation: 20 pts (did the team sell the idea)
3. Use of Technology: 40 pts (is technology being used an effective way)
4. Feasibility/Impact for Business/Industry: 20 pts (doable/valuable/effective)

Academic courses undergraduate (e.g. capstones, games, innovative special topics projects, other course projects) (18)   **+**

Academic courses graduate (e.g. capstones, games, innovative special topics projects, other course projects) (7)   **–**

* Project will be featured during the Flash Session

- **GC-332 Website SEO Analysis PFC NYC** (Graduate Capstone) by Phillips, Corey; Hutto, Travis; Saaka, Ashraf; Garuba, Tomisin; Olaosebiomo, Ayowole T
  Abstract: A website's rating and visibility in search engine results pages are improved through search engine optimization (SEO). Businesses benefit from SEO to increase website traffic, leads, and sales. This summary reviews SEO, its advantages, and the main tactics and strategies applied to Paddle for a Cure NYC. It also emphasizes the significance of technical optimization, link development, keyword research, and content for Paddle for a Cure NYC. This abstract underlines the need for constant optimization and monitoring to maintain Paddle for a Cure NYC's website visibility and competitiveness in search results.
  Department: Information Technology
  Supervisor(s): Dr. Jack Zheng
  Topic: Data/Data Analytics
  Presentation | Poster | Website

- *** GC-333 Analysis of Alternatives of Workstation Deployment Solutions** (Graduate Capstone) by Tilton, Tyler L; Moscosa, Jesus; Singleton, Kameron; Pitts, Kimberly; Parungao, Roland J
  Abstract: In searching for a new workstation deployment solution, GTRI identified 15 ranked characteristics which an acceptable solution should possess. These 15 characteristics were used as the basis for this Analysis of Alternatives. This process consisted of a research phase and testing phase. During the research phase, team members compiled a list of potential solutions and gathered basic information about each. This list was eventually pruned to ten products which were further researched and scored based on their reported ability to meet the supplied requirements. As a result of this research, Ivanti DSM and Theopenem were selected for testing in a lab environment. Despite KACE scoring higher than Ivanti and Theopenem, Theopenem was ultimately chosen due to the unavailability of a KACE demo installation. The testing phase consisted of building a test environment for each tool. These environments were relatively simple and consisted of one server, a small network, and a client. During this phase, the tools were evaluated using GTRI's requirements and any other features which may be

useful to GTRI. The process and experience were documented along the way. Based on the research and testing phases' results, it was concluded that Theopenem was the optimal deployment tool for GTRI, given its ease of use and performance over Ivanti DSM.
Department: Information Technology
Supervisor(s): Dr. Zhigang Li
Topic: Enterprise Systems
Presentation | Poster | Website

- **GC-337 Analysis of Alternatives for Workstation Deployment for GTRI** (Graduate Capstone) by Freeman, Josh; Glaze, Kevin; Curtis, Doug; Dougal, Kayla; Allam, Rakesh
Abstract: Georgia Tech Research Institute is requesting an analysis of alternatives of workstation deployment solution that can deploy an operating system to a workstation. This deployment solution must at least be able to deploy Windows 10, Windows 11, Red Hat Enterprise Linux 8 and 9; support multiple users simultaneously, support various models, and run custom scripts. The objective of the analysis of alternatives is to provide Georgia Tech Research Institute with one deployment solution that can replace their current software that facilitates this process. There are inefficiencies to resolve in their current environment such as deploying various operating systems and applying packages, updates, and applicable security policies. This multi-step process takes time to attain the desired outcome. By providing an alternate solution, it is foreseeable to provide cost savings along with overall efficiency to Georgia Tech Research Institute.
Department: Information Technology
Supervisor(s): Dr. Zhigang Li
Topic: Enterprise Systems
Presentation | Poster | Website

- **GC-340 AI for Quantitative Trading** (Graduate Capstone) by Ponakaladinne, Kiran; Binigari, Sai Charan; Jawale, Mayuri; Petakamsetti, Gowthami; Agarwal, Nihal Kumar
Abstract: AI for quantitative trading involves using machine learning and other AI techniques to analyze financial data and make informed trading decisions. By automating the trading process and leveraging the power of AI, traders can potentially improve their performance and generate better returns. The goal is to identify and capitalize on available trading opportunities by using computer algorithms and programs based on simple or complex mathematical models. Stock market indicators are statistical measures that provide insights into the behavior of the stock market as a whole or of individual stocks. These indicators are used by investors, traders, and analysts to evaluate market trends and conditions, predict future price movements, and make informed investment decisions. After establishing an understanding of these indicators and performance metrics, one can understand the process of developing a trading simulator, strategy optimizer, and financial machine-learning pipeline. Multiple trading strategies are implemented systematically and adapted to real-time market conditions using machine learning. Stock movement is predicted by supervised models to demonstrate how machine learning can be applied to quantitative trading. In addition, multiple optimization techniques are used in trading to maximize returns and minimize risk. Several machine learning techniques and methodologies like feature selection are used to find

accurate prediction.
<u>Department</u>: Information Technology
<u>Supervisor(s)</u>: Dr. Ying Xie
Topic: Artificial Intelligence
<u>Presentation</u> | <u>Poster</u>

- *** GC-345 BrainNet: Using Deep Learning to Classify Brain Tumors** (Graduate Capstone) by <u>Deem, Ryan</u>
  <u>Abstract:</u> Brain tumors are a common type of cancer, and they do not discriminate based on gender, age, or ethnicity. That said, the severity and type of tumor vary among the diagnosed individual, cancerous or benign. The three most common types for diagnosed individuals are glioma, meningioma, and pituitary. Even so, identifying the type of tumor can be an arduous process for both the doctor and the patient, but one technique known as Convolutional Neural Network (CNN) has been particularly effective in expediently and reliably determining the type of brain tumor. A CNN is a type of neural network that can independently extract imaging features (e.g., face shape, eye color of images of faces), one of these models is known as ResNet101, which contains several residual layers. Through these layers, data can be spread forward, and retain information about the findings of the patient's images. The ResNet model layers were frozen in this case for the first 10 epochs, then when the model had 50 of the layers of the base unfrozen which resulted in the training accuracy being 98% after 10 more epochs and the test accuracy being 96% after it finished. The conclusion drawn is that the results mean that they have shown that they have better than most existing models for this application, due to that a majority of models can only achieve the low 90%.
  <u>Department</u>: Computer Science
  <u>Supervisor(s)</u>: Dr. Md Abdullah Al Hafiz Khan
  Topic: Artificial Intelligence
  <u>Presentation</u> | <u>Poster</u>

- **GC-367 A Comparative Study of Virtual Network Architectures for Cloud Computing Environments** (Graduate Capstone) by <u>SREERAMOJU, SUVIDHA</u>; <u>Maddukuri, Susmitha</u>
  <u>Abstract:</u> Virtual networks have emerged as a promising solution for creating customized network topologies that can meet the specific needs of different cloud environments. In this project, we present a comparative study of three different virtual network architectures for cloud computing environments. We compare these architectures based on a set of criteria, including performance, scalability, flexibility, and security. Our evaluation shows that all three virtual network architectures have their advantages and disadvantages. The choice of virtual network architecture depends on the specific needs and requirements of the cloud environment. Our evaluation provides insights into the trade-offs between different virtual network architectures and can inform the design and implementation of virtual networks for cloud computing environments
  <u>Department</u>: Computer Science
  <u>Supervisor(s)</u>: Dr. Ahyoung Lee
  Topic: IoT/Cloud/Networking
  <u>Presentation</u> | <u>Poster</u>

- **GC-380 DineNGo Application** (Graduate Capstone) by <u>Jonnalagadda, Sai Sushanth Reddy</u>; <u>Vancha, Sahith Vardhan Reddy</u>; <u>Annavajhula, Subramanya Rahul</u>

Abstract: This project aims to upgrade the DineNGo application, a software tool for restaurant management, with new features specified by the client, The Driven Software Solutions. The upgraded version includes enhancements to users' roles, such as implementing Role-Based Access Control (RBAC), and adding a payment required feature before order placement. Additionally, the new features aim to improve payment processing, reduce trips back and forth to the POS terminal, and provide a secure payment experience for customers. This document provides an overview of the project's scope, objectives, and system overview, along with the operational policies and constraints.
Department: Software Engineering and Game Design and Development
Supervisor(s): Dr. Reza Parizi
Topic: Software Engineering
Presentation | Poster | Website

- *** GC-382 Artificial Intelligence(AI) for Quantitative Trading** (Graduate Capstone) by Akpan, Winifred; Ayo, Emmanuel; Kennedy, Jason; Browning, Malek
  Abstract: This project involves the use of Artificial Intelligence (AI) and Machine Learning (ML) techniques in quantitative trading and stock market analysis for educational purposes. The goal of this project is to predict stock market movement to help investors mitigate risks associated with trading and to provide higher returns. It involves the use, implementation, and refinement of basic python framework codes, sklearn library (pandas and numpy), in addition to the development and application of a Linear Regression labeling strategy to predict future daily stock trends, and the utilization of a Supervised Learning AI model. The techniques developed and utilized during this project will be used to analyze market trends, predict market movements, and optimize investment strategies. This project will provide knowledge and practical skills in AI, ML, and quantitative trading.
  Department: Information Technology
  Supervisor(s): Dr. Ying Xie
  Topic: Data/Data Analytics
  Presentation | Poster | Website

Graduate Research (9)   —

* Project will be featured during the Flash Session

- *** GR-314 Reinforcement Learning based Offloading Scheme Computation to Optimize Latency-Energy in Collaborative Cloud Networks** (Graduate Research) by Mhatre, Jui
  Abstract: Growing technologies like virtualization and artificial intelligence have become more popular on mobile devices. But lack of resources faced for processing these applications is still a major hurdle. Collaborative edge and cloud computing are one of the solutions to this problem. Remote servers have enough resources to support computation-heavy tasks and compute the results faster. But transmission time and energy are involved while offloading the computation to remote servers such as cloud and edge devices. There is a need to find an optimal offloading ratio for cloud as well as edge servers such that entire computation on remote as well as local can be achieved minimum

energy consumption as well as minimum delay. We have proposed a multi-period deep deterministic policy gradient (MP-DDPG) algorithm to find an optimal offloading policy by partitioning the task and offloading it to the collaborative cloud and edge network to reduce energy consumption. Our results show that MP-DDPG achieves the minimum latency and energy consumption in the collaborative cloud network. We have compared our results with the existing DDPG-based approach and achieved about 65% speedup in terms of latency. Also, we observed energy consumption reduces with an increase in the number of edge servers.
Department: Computer Science
Supervisor(s): Dr. Ahyoung Lee
Topic: IoT/Cloud/Networking
Presentation | Poster

- **GR-325 Early Heart Disease Detection Using Mel-Spectrograms and Deep Learning** (Graduate Research) by Donkada, Sricharan
  Abstract: Heart diseases are the leading cause of mortality worldwide, emphasizing the need for early detection and intervention. Traditional heart sound analysis using a stethoscope is subjective and prone to variability, necessitating a more objective and reliable approach. In this study, we present a deep learning model designed for heart sound analysis to enable the early detection of heart diseases. The model's architecture combines convolutional and fully connected layers with max-pooling and dropout operations, effectively capturing intricate patterns in heart sounds. We trained and validated our model on the Physionet 2016 challenge dataset, consisting of 3240 labeled heart sound recordings. Our deep learning model achieved an accuracy of 91.9%, surpassing the current state-of-the-art performance of 89.7%. This result demonstrates the model's potential to significantly reduce diagnostic errors and facilitate timely interventions, ultimately improving patient outcomes and reducing healthcare costs.
  Department: Information Technology
  Supervisor(s): Dr. Seyedamin Pouriyeh
  Topic: Artificial Intelligence
  Presentation | Poster

- **GR-334 Comparative Evaluation of EMBED Dataset for Mammogram Classification Using Deep Learning Techniques** (Graduate Research) by Nalla, Vineela
  Abstract: Breast cancer is a global health concern for women. The detection of breast cancer in its early stages is crucial, and screening mammography serves as a vital leading-edge tool for achieving this goal. In this study, we evaluated the performance of centralized versions of Resnet 50v2 and Resnet 152v2 models for classification of mammograms using different datasets, which were divided by location number extracted from the EMBED dataset. The datasets were preprocessed and used various techniques to improve the performance of the models. The models are trained and evaluated using metrics such as accuracy, area under the curve (AUC), F1 score, precision, and recall. The results indicate good performance for both models, with the Resnet 152v2 model slightly outperforming the Resnet 50v2 model in terms of AUC score. Our findings demonstrate the potential of machine learning algorithms in breast cancer screening, with our model achieving an AUC score of 0.83.
  Department: Information Technology
  Supervisor(s): Dr. Seyedamin Pouriyeh
  Topic: Data/Data Analytics

Presentation | Poster

- **GR-342 Integration of Blockchain in Computer Networking: Overview, Applications, and Future Perspectives for Software-defined Networking (SDN), Network Security and Protocols** (Graduate Research) by Hossain Faruk, Md Jobair*

  Abstract: The rapid advancement and increasing complexity of computer networks have created a need for robust, secure, and scalable solutions to manage and protect network resources. Blockchain, an emerging distributed ledger technology, offers enhanced security, transparency, and privacy preservation, making it a promising solution for addressing networking challenges. This paper presents a comprehensive survey of blockchain integration in computer networking, focusing on its potential applications, benefits, and future perspectives in Software-defined Networking (SDN), network security, and networking protocols. We identify that blockchain's tamper-proof nature could significantly improve network security by mitigating risks associated with centralized control and single points of failure. The integration of blockchain in computer networking has the potential to increase trust and transparency among network participants, as it allows for secure, verifiable, and auditable transactions and communication. Blockchain also can streamline the management of Software-defined Networking (SDN) by enabling decentralized and automated network control, resource allocation, and orchestration. We also find that utilizing blockchain can address network challenges, such as mitigating DDoS attacks, enhancing intrusion detection and prevention, and securing routing protocols. However, we identify potential limitations of blockchain integration in computer networking, such as scalability challenges arising from the growing size of the distributed ledger and increasing network traffic. We emphasize the need for further research in optimizing consensus mechanisms, enhancing scalability and privacy preservation techniques interoperability, and facilitating standardization of networking protocols and practices.
  Department: Computer Science
  Supervisor(s): Dr. Ahyoung Lee
  Topic: IoT/Cloud/Networking
  Presentation | Poster

- **GR-343 An Experimental Study: Performance of Load Balancing Algorithms in SDN-Enabled Cloud Computing Networks** (Graduate Research) by Challagundla, Samhitha

  Abstract: To meet the requirements of modern IT, it is crucial to address the numerous limitations of current cloud computing networking infrastructures. One promising solution to overcome these constraints is Software Defined Networking (SDN). SDN is an innovative networking approach that utilizes software-based controllers or APIs to manage and direct network traffic on top of underlying hardware infrastructure. SDN plays a major role in Cloud Computing in that it allows users to address different changes quickly as they come. One of its major advantages is that it streamlines the network configuration procedure and boosts network monitoring and performance. This study aims to implement various load-balancing algorithms for SDN to analyze the network performance. The implementation uses the POX controller as an SDN controller and Mininet software to emulate the network. The load-balancing algorithms are programmed using Python, which is also

employed to create the network topology. The findings demonstrate that the Weighted Round Robin algorithm outperforms all the other algorithms that were evaluated.
Department: Computer Science
Supervisor(s): Dr. Ahyoung Lee
Topic: IoT/Cloud/Networking
Presentation | Poster

○ *** GR-358 Impact of Avatar's Behavioral Change with Quantity on Human Perception in Immersive Experiences** (Graduate Research) by Wile, Nicholas L
Abstract: As virtual reality technology evolves, researchers have found that the characteristics of virtual avatars including appearance, representation, and proximity, can significantly influence the immersive experience of the user. This project investigates the impact of the number of avatars and their behavioral influence on the user in a simulated learning environment. We developed a virtual reality classroom system with Unity designed to elicit, track, and record the user's behavioral changes including eye gaze, head, and hand movement using HTC VIVE Pro Eye and physiological signals including Heart Rate (HR) and Galvanic Skin Response (GSR), while the user delivers presentations to classrooms full of varying numbers of avatars. During the presentation, a fixed percentage of randomly chosen avatars perform an abnormal behavior, either a change in eye gaze or head movement. We hypothesized that the influence of this abnormal behavior on the user will be exponentially greater when the total number of avatars is larger, even though the percentage of avatars performing the abnormal behavior relative to the total number of avatars is held constant. In our research, we explore this phenomenon and use the results to design guidelines for the social VR experience.
Department: Software Engineering and Game Design and Development
Supervisor(s): Dr. Sungchul Jung
Topic: Games
Presentation | Poster

○ **GR-362 SCALE-Sim extension to support GNN inputs and CNN back propagation** (Graduate Research) by Desai, Rutul; Pasupuleti, Phani Akshaya Sri; Deng, Bobin; Liu, Guangchi
Abstract: In recent years, CNNs (Convolutional neural Network) and GNNs (Graph Neural Network) have gained a lot of attention and popularity in various fields such as computer vision, natural language processing, and social network analysis. Training large scale CNN and GNN models may take up to several months or sometimes years to complete. SCALE-Sim is a CNN accelerator with systolic array and SRAMs. However, SCALE-Sim only support CNN inference and not back propagation. To evaluate the CNN training, in this work we extend the SCALE-Sim to support CNN back propagation. Because the importance of the GNN applications and their training bottlenecks, we also explore how to integrate GNN training in SCALE-Sim via GraphSAGE to generate node embedding. The goal of this work is to extend SCALE-Sim to support CNN and GNN training, which enable us to evaluate the efficiency of machine training systems.
Department: Computer Science
Supervisor(s): Dr. Bobin Deng, Dr. Guangchi Liu
Topic: High Performance Computing

Presentation | Poster

- **GR-384 Benchmarking Network Service Performance Using the POWDER Wireless Testbed** (Graduate Research) by Horton, Dillon J; Nguyen, Manh V; Khandavilli, Sri Sesha Sailaja Lakshmi Tulasi; Le, Thinh Van
  Abstract: 5G RAN slicing provides a way to split network infrastructure into self-contained slices which can have various virtual network functions (VNFs) mapped onto them. Much work has gone into creating robust mapping and resource allocation algorithms in order to efficiently embed VNFs onto the available nodes in a slice. However, in order to most efficiently embed these VNFs we need to understand the resource and bandwidth needs of the services we are trying to embed. This project seeks to provide an accurate assessment of the needs of three commonly used network services. We do this by testing each network service using real world physical machines on the POWDER network testbed. We collect bandwidth and CPU usage data from each test and use it to analyze the needs of the network service when being embedded onto physical nodes during network slicing.
  Department: Computer Science
  Supervisor(s): Dr. Tu Nguyen
  Topic: IoT/Cloud/Networking
  Presentation | Poster

- **GR-389 Molecular Dynamics and Protein-Protein Interactions (PPIs) on SARS-CoV-2 coronavirus** (Graduate Research) by Addepalli, Durga Narayana Varma
  Abstract: The objective of this comparative analysis is to study the behavior of the Original, alpha, beta, gamma, delta, and omicron variants of SARS-CoV-2 coronavirus under conditions that resemble the human body. To achieve this, we conducted Molecular Dynamics simulations for all variants in the same environment. Additionally, we conducted salt bridge and hydrogen bond analyses to further investigate the behavior of the SARS-CoV-2 variants. These analyses allowed us to examine the interactions between amino acid residues and to determine the stability of the protein structures. By integrating these analyses with our Molecular Dynamics simulations, we were able to gain a comprehensive understanding of the behavior of each variant in a human-like environment. This information could be crucial in developing effective treatments and vaccines against COVID-19. Overall, our study provides valuable insights into the molecular dynamics and protein-protein interactions of the SARS-CoV-2 variants and highlights the importance of further research in this area to combat the ongoing pandemic.
  Department: Information Technology
  Supervisor(s): Dr. Chole Yixin Xie
  Topic: Data/Data Analytics
  Presentation | Poster

- *** GR-391 Insight into current COVID-19 variants and data Science Applications** (Graduate Research) by POTLAPALLI, RAVI; Ande, Thanusha Sai
  Abstract: COVID-19 has undergone several mutations resulting in the emergence of new variants such as Alpha, Beta, Gamma, Delta, and Omicron. Data science plays a vital role in understanding the spread of COVID-19 and its variants. The emergence of new COVID-19 variants has raised concerns about the effectiveness of existing vaccines and treatments. This poster provides

insights into the current COVID-19 variants and the data science applications used to monitor and understand their spread. We will showcase the use of SQL to manage and analyze genomic data of SARS-CoV-2 variants, Power BI for visualization and tracking of COVID-19 cases and deaths, and machine learning algorithms for variant classification and prediction of transmission. The poster highlights the importance of integrating data science tools in COVID-19 research for effective variant surveillance, risk assessment, and mitigation strategies.
<u>Department</u>: Computer Science
<u>Supervisor(s)</u>: Dr. Chole Yixin Xie
Topic: Data/Data Analytics
[Presentation](#) | [Poster](#)

Undergraduate Research (7)   —

* Project will be featured during the Flash Session

- *** UR-331 Read-Talkback Assisted Platform for Aphasia** (Undergraduate Research) by [Clayton, Michael j](#); [Dixon, Maxwell P](#); [Riggin, Navonte](#)
  <u>Abstract:</u> Every year, there are lots of people who are affected with brain or other traumatic injuries that lead to some form of speech impairment. One of these conditions is Aphasia, which can cause a loss of word-finding or word-substitution, agrammatism, and apraxia. The team will be developing a Flutter app with a focus on Android systems that will track the user's eye movements and read out the word that is being focused on. The goal of this app is to assist in improving the speech production and day-to-day activities of people with Aphasia or a similar disorder.
  <u>Department</u>: Computer Science
  <u>Supervisor(s)</u>: Dr. Patrick Bobbie, Prof. Sharon Perry
  Topic: Mobile Application
  [Presentation](#) | [Poster](#) | [Website](#)

- *** UR-347 Blockchain in Ethereum** (Undergraduate Research) by [Lovell, Savvy](#); [Priest, Joshua](#); [Cooper, Cameron D](#)
  <u>Abstract:</u> Earthereum is a cryptocurrency token built on the Ethereum blockchain utilizing an ERC-20 contract and implemented with Solidity in Remix and deploying using MetaMask. The mission of Earthereum is developing an ecologically-friendly utility for cryptocurrencies.
  <u>Department</u>: Computer Science
  <u>Supervisor(s)</u>: Dr. Yong Shi, Prof. Sharon Perry
  Topic: FinTech
  [Presentation](#) | [Poster](#) | [Website](#)

- *** UR-350 Quantum Game Theory** (Undergraduate Research) by [Thomassy, Christian](#); [Curtis, Sean J](#); [Lacey, Cody A](#)
  <u>Abstract:</u> Quantum computing is a computing paradigm that utilizes the properties of quantum mechanics such as superposition, interface and entanglement for data processing and other tasks. Quantum computing can be used to work on the same problems existing supercomputers do but in a much more efficient manner. Classical game theory is a process of modeling that is widely used in AI applications. The extension of this theory to the quantum field is known as quantum game theory. It can be a promising tool for overcoming critical problems in quantum communication and the

implementation of quantum artificial intelligence. Quantum game theory allows the player(s) to formulate strategies differing from the conventional way of playing a game. We review the performance of classical and quantum strategies on five classical games by analyzing the logic and outcomes of each approach.
Department: Computer Science
Supervisor(s): Dr. Yong Shi, Prof. Sharon Perry
Topic: Games
Presentation | Poster | Website

- *** UR-363 Quantum Machine Learning Applied to Cybersecurity** (Undergraduate Research) by Waugh, Adam M; Destito, Anna; Ragsdale, Joseph D
  Abstract: We propose the development of a system that uses the TensorFlow Quantum and PennyLane packages and applies quantum machine learning (QML) algorithms to process various security and malicious data sets and compares the performance with classical machine learning (CML) algorithms. One of the most important applications of QML is for cybersecurity. This project will begin with research of quantum computing and machine learning, then followed by the development of a system that uses the TensorFlow Quantum and PennyLane packages and applies quantum machine learning (QML) algorithms to process various security and malicious data sets and compares the performance with classical machine learning (CML) algorithms.The data sets for our modules include DDoS prevention, malware detection, user behavior anomaly detection, and spam email filtering. We provide detailed instructions for program implementation on our project website in order to better proliferate quantum programming in order to encourage others to explore quantum algorithms.
  Department: Computer Science
  Supervisor(s): Dr. Yong Shi, Prof. Sharon Perry
  Topic: Artificial Intelligence
  Presentation | Poster | Website

- **UR-369 Classifying Chest X-Rays of Pneumonia Using Transfer Learning** (Undergraduate Research) by Swann, Michael B; Clark, Noah
  Abstract: Convolutional neural networks are a powerful tool in machine vision when it comes to identifying patterns. Considering the importance of identifying patterns in medical imaging, there is a great opportunity to develop effective CNN models to analyze medical imagery. Furthermore, the introduction of transfer learning has introduced the opportunity to develop models which are more accurate and better generalize to other datasets. Therefore, we explore the efficacy of different CNN models with respect to a dataset regarding X-ray imaging for pneumonia. We do this through using transfer learning models and demonstrate that pretrained models outperform models which are trained only on the dataset available. We also highlight additional methods which could be expanded upon in future research and hope to develop a state-of-the-art model for this particular dataset in the final version of this paper.
  Department: Computer Science
  Supervisor(s): Dr. Md Abdullah Al Hafiz Khan
  Topic: Artificial Intelligence

Presentation | Poster | Website

- ○ **UR-379 Combatting Data Heterogeneity in Federated Learning** (Undergraduate Research) by Hutchison, Andrew J; Bull, Justin C; Cummings, Aaron

  Abstract: The growing concern in data privacy has led to new paradigms in Machine Learning primarily focused around keep data safe and secure. In our research project, we studied Federated Learning, specifically utilizing knowledge distillation and an autoencoder in an attempt to create a sustainable model that could be used in a field such as Heathcare. We propose a Federated Model using the Flower framework, trained on the MedMNIST2D dataset (Organ(A/C/S)MNIST), using Knowledge Distillation as a method of sharing the global model, and a Variational Autoencoder to deal with the problem of Data Heterogeneity that can arise on a distributed network. Our results on a cumulative model are tentative but hope to prove that the idea can be utilized in networks with varying sizes of edge device, usage, and types.
  Department: Computer Science
  Supervisor(s): Prof. Sharon Perry, Dr. Xinyue Zhang
  Topic: Artificial Intelligence
  Presentation | Poster | Website

- ○ *** UR-390 BactiFind: A Novel CNN-based Framework to Classify Bacterial Species** (Undergraduate Research) by Lowhorn, Ryan; Cardwell, Zac

  Abstract: Abstract—Bacterial species identification is an essential step in diagnosing diseases caused by bacterial attacks. Effective prescription to cure these diseases depends on accurate bacterial species identification. Faster identification along with accuracy is essential because some bacteria grow fast in the human body. However, bacterial species classification using a laboratory environment through traditional approaches is time-consuming, and it depends on human expertise, which is not immune to human error. Well-trained and experienced microbiologists demonstrate the probability of preparing bacterial species identification reports with lower error rates. However, hiring experienced microbiologists is expensive. Convolutional Neural Network (CNN)-based automatic bacterial species classification system is a potential innovative alternative to traditional laboratory methods, which is faster and cheaper. However, there are multiple challenges associated with developing a CNN-based bacterial species classifier. This paper proposes an innovative CNN-based framework, BactiFind, to overcome the obstacles and automatically identify 33 different bacterial species and generate reports for physicians. It classifies bacterial species with 96.42% accuracy, 97.13% precision, 97.25% recall, and 3.58% error rate. The well-optimized network architecture, innovative bypass layer, and effective image augmentation method have facilitated this outstanding performance which has been further validated using state-of-the-art CNN evaluation methods. Index Terms—Bacterial species classification, Convolutional Neural Network, image augmentation, network optimization, bacterial image transformation.
  Department: Computer Science
  Supervisor(s): Dr. Md Abdullah Al Hafiz Khan, Dr. Yong Shi
  Topic: Artificial Intelligence
  Presentation | Poster

Exploratory Projects (1)   —

* Exploratory Projects for C-day are not judged. This category is reserved for students who are still taking foundation courses (e.g. CSE 1321, IT 5443), and for teams with more than 5 members.

- *** eC-371 PlanIt CRM - Refactoring for the Future** (Graduate Capstone)
  by Hall, Justin; Falaiye, Oluwaseyi; Anderson, Thomas; Bariki Vidura, Sai Krupa; Dogan, Ahmet Bugra; Guclu, Samet Yekta
  Abstract: Planit CRM is a Customer Relationship Management (CRM) software that helps in managing and tracking projects, tasks, invoices, quotes, leads, customers, transactions and much more. This software allows anyone to manage leads, create invoices, and start collecting payments seamlessly. The system was developed by Driven Software Solutions under the guidance of Shahzib Sarfraz in 2018. The software has since been used by business owners to allow for easier management of the income and expenses of their operation. It is supported by a team of around fifty developers who maintain the PlanIT CRM software off the site https://planitcrm.com, which can be reached through the domain https://drivensoftwaresolutions.com The primary objective of this project is to refactor the source code of the PlanIT CRM system to utilize Angular for the front-end and a combination of Laravel and NodeJS for the backend. The appropriate software documentation and user guides will be generated as well. Overall, the system will be refactored to allow for greater scalability and versatility of the software.
  Department: Software Engineering and Game Design and Development
  Supervisor(s): Dr. Reza Parizi, Shahzib Sarfraz
  Topic: Software Engineering
  Presentation | Poster | Website