Presenter Names: Christopher Gabriel Lopez
Program & Institution: CSTEP / NYC College of Technology
Presentation Title: Transit Comfort Through Passive Design Strategies at Union Square
Poster Category: Technology/Engineering - Architecture

Abstract:

As rising temperatures, poor air quality, and increasing energy demands continue to challenge New York City's transit infrastructure, there is a growing need to develop sustainable design strategies that improve environmental conditions and commuter comfort within MTA subway stations. This research project looks into potential architectural design solutions for performance of 14th Street Union Square station in Manhattan, one of the busiest and most complex transit hubs in New York City. In collaboration with ReSESS data research on heat, and air pollution, airflow, and PM2.5 concentrations throughout the station we document existing architectural and environmental conditions. We will be using passive design strategies, including cross ventilation, stack and piston effects, vegetation, and high-performance glazing, as potential interventions to improve air circulation and thermal comfort. Data will be collected using Temtop Air Quality monitor, thermal imaging cameras, and software photogrammetry for precise measurements and 3D scan of Union Square, to address environmental concern and inform design proposals. Because Union Square is a multi-level interchange station, it is anticipated that deeper underground platforms will exhibit higher concentrations of PM2.5, elevated temperatures, and reduced ventilation compared to platforms closer to the surface. The findings will provide valuable insights into improving design solutions, environmental quality, passenger health, and overall user experience while informing future sustainable design interventions for New York City's transit system.

Abstract Format

Presenter Names: Juliana Trujillo & Brisalis Fernandez
Program & Institution: CSTEP / NYC College of Technology
Presentation Title: Environmental Analysis of Heat Accumulation at Queensboro Plaza station
Poster Authors: (Include everyone who worked on the poster)
Poster Category: (Select one from the list below)

- **Biological/Life Sciences** – Biology, Botany, Ecology, Environment, Molecular & Cellular Biosciences, etc.
- **Human Services** – Studies on disease, families, children, wellness, aging, service agencies, and community impact
- **Physical Sciences** – Astronomy, Chemistry, Earth Science, Materials Science, Physics, Science policy/history
- **Social Sciences** – Anthropology, Sociology, Psychology, Political Science, History, Geography, etc.
- **Technology/Engineering** – Robotics, fiber optics, computer science, computer games, engineering, architecture, CAD, graphics, etc.

Type your abstract here:

Summer heat accumulation in MTA subway stations creates uncomfortable conditions for thousands of daily commuters and can negatively affect rider comfort, health, and the overall transit experience. According to the **Regional Plan Association** in its report *From Summer of Hell to Summer of Extreme Subway Heat* (2019), temperatures on New York City subway platforms have been measured as high as **101°F** during extreme summer heat, highlighting the urgent need to better understand heat accumulation and improve station design. This research investigates heat accumulation and temperature conditions at Queensboro Plaza station in New York City to identify the environmental factors contributing to excessive heat and evaluate opportunities for improving thermal comfort. The study combined on-site observations, temperature measurements, and analyses of wind patterns, shading conditions, urban heat effects, station geometry, and construction materials to better understand the station's environmental performance. The findings provide a foundation for developing architectural design strategies that can reduce heat buildup, improve passenger comfort, and contribute to more resilient, sustainable, and climate-responsive transit environments.

Presenter Names: Muhammad Abubakar, Amani Alkobadi and Jahaira Casicacana
Program & Institution: CSTEP / NYC College of Technology

Mentor: Professor Semmler and Professor Conzelmann

Presentation Title **Sustainable Design Strategies To Improve Environmental Conditions**

In 191st Subway station

Poster Authors: Muhammad Abubakar, Amani Alkobadi and Jahaira Casicacana

Poster Category: (Select one from the list below)

- **Biological/Life Sciences** – Biology, Botany, Ecology, Environment, Molecular & Cellular Biosciences, etc.
- **Human Services** – Studies on disease, families, children, wellness, aging, service agencies, and community impact
- **Physical Sciences** – Astronomy, Chemistry, Earth Science, Materials Science, Physics, Science policy/history
- **Social Sciences** – Anthropology, Sociology, Psychology, Political Science, History, Geography, etc.
- **Technology/Engineering** – Robotics, fiber optics, computer science, computer games, engineering, architecture, CAD, graphics, etc.

Type your abstract here:

Summer in New York City intensifies the already harsh environmental conditions inside deep-tunnel subway stations, where heat and pollution accumulate far beyond street-level levels. At the 191st Street station, these factors combine to create an underground environment that challenges both commuter comfort and respiratory health. This project examines environmental conditions at the 191st Street subway station and identifies sustainable design strategies to reduce air pollution and improve passenger well-being. The station's deep-tunnel layout, limited ventilation, and high train frequency contribute to elevated levels of particulate matter (PM2.5), heat buildup, and stagnant airflow. Using observational analysis and environmental research, this study evaluates how tunnel geometry, platform configuration, and material surfaces influence the movement and accumulation of pollutants. Findings show that poor airflow circulation allows ferrous PM2.5 from brake dust, rail friction, and tunnel debris to remain suspended, increasing commuter exposure. To address these issues, the project proposes sustainable interventions such as forced ventilation system (FVS), enhanced filtration, angled ceiling panels to guide airflow, platform screen doors, and the use of moisture absorbing

materials control humidity. These strategies demonstrate how targeted design improvements can create healthier, more resilient subway environments, particularly in deep stations like 191st Street.

Presenter names: Anthony Glenn, Gabriela Bernales, Brian Candela

Program and institution: CSTEP/NYC College of Technology

Presentation Title: USE OF UNIVERSAL ROBOTS UR3e FOR AUTOMATED MANUFACTURING ACTIVITIES.

Poster Authors: Anthony Glen, Gabriela Bernales, Brian Candela

Poster Category: Technology/ Engineering – Robotics

This research examines the growing role of collaborative robots in modern manufacturing and their ability to safely interact with human workers. Universal Robots equipped with advanced programming and vision technologies are used to explore manufacturing operations such as material handling and automated assembly. Students investigated how robot programming, motion planning, and safety features contribute to efficient industrial processes. This research also highlights the importance of integrating robotics into K-12 and higher education to build the next generation of engineers, technicians, and technology educators.

Abstract Format

Presenter Names: Suchi Chowdhury & Shiou Ching Chen
Program & Institution: CSTEP / NYC College of Technology
Presentation Title: Switch Interface Device for Assistive Technology Users
Poster Authors: Suchi Chowdhury & Shiou Ching Chen
Poster Category: (Select one from the list below)

- **Biological/Life Sciences** – Biology, Botany, Ecology, Environment, Molecular & Cellular Biosciences, etc.
- **Human Services** – Studies on disease, families, children, wellness, aging, service agencies, and community impact
- **Physical Sciences** – Astronomy, Chemistry, Earth Science, Materials Science, Physics, Science policy/history
- **Social Sciences** – Anthropology, Sociology, Psychology, Political Science, History, Geography, etc.
- **Technology/Engineering** – Robotics, fiber optics, computer science, computer games, engineering, architecture, CAD, graphics, etc.

Type your abstract here:

The Switch Interface Device for Assistive Technology Users is a non-invasive, AI-assisted assistive robotic arm designed to help individuals with severe motor impairments perform everyday tasks more independently. The system combines Electroencephalography (EEG) and Electrocardiography (ECG)/Photoplethysmography (PPG) to provide both intelligent robotic arm control and real-time health monitoring.

EEG serves as the primary control method by collecting brain signals and using artificial intelligence to interpret these biosignals into commands that control the movement of the robotic arm. The ECG/PPG system continuously monitors the user's heart activity by measuring heart rate, Heart Rate Variability (HRV), and heartbeat patterns. A Roboflow AI model analyzes the heartbeat waveform and classifies the user's condition into three categories: Calm, High Workload, and Abnormal Pulse Pattern. Based on the detected condition, the system provides real-time health feedback and recommendations to help users better understand and manage their physical well-being.

The assistive robotic arm was designed and developed using 3D modeling and 3D printing to create a lightweight, customizable, and cost-effective device. By combining AI-based brain signal interpretation with AI-assisted heart monitoring, the proposed system creates a more intelligent and adaptive assistive robotic arm that supports both user interaction and health awareness. This project demonstrates how Electrical Engineering and Computer Engineering Technology can be combined with biosignal processing, artificial intelligence, and 3D printing to develop an accessible, intelligent, and user-friendly assistive technology.

Presenter Names: India Barker, Tanzina Begum, Angelo Gomez, Travis Lake
Program & Institution: CTEP / NYC College of Technology
Presentation Title: Cloud Security Assessment: Progress Software Vulnerabilities and IAM Controls
Poster Authors: India Barker, Tanzina Begum, Angelo Gomez, Travis Lake, and Professor Ossama Elhadary (Faculty Mentor)
Poster Category: Technology/Engineering

Abstract

Enterprise cloud applications are targeted by cyberattacks that exploit errors in their software. The purpose of this project is to assess potential security risks associated with managing enterprise cloud platforms. In particular, we have identified two major vulnerabilities in Progress Software's MOVEit Automation and WhatsUp Gold. Both applications contain severe vulnerabilities, such as the CVE-2026-4670 authentication bypass flaw and SQL injection, which permit an attacker to log into a target application without entering any credentials, elevate themselves to a high level of privilege, and obtain complete administrative access over the server. It is essential to study how remote and unauthenticated attackers use application-layer exploits to identify and address these significant holes in the defenses of each application prior to widespread exploitation.

We utilize a systematic threat-model-based evaluation process to determine effective defense-in-depth solutions. We develop a robust cloud security control framework based upon a detailed analysis of how an attacker uses unauthenticated web exploits to create unauthorized access, and we outline the implementation of controls within that framework. This framework includes a variety of stringent Identity and Access Management (IAM) constraints, multi-factor authentication (MFA), and data encryption implementations to enforce the principle of least privilege while pairing these architectural defenses with immediate vendor patching.

Our current findings primarily report on anticipated security results and proactive measures taken to contain the risk. Based on our hypothesis, if organizations deploy a combination of centralized IAM policies along with continuous monitoring of backend network activity, they will effectively block automated scanning campaigns. Validating this hypothesis implies that organizations can significantly limit their external exposure before completing the full patching cycle.

Presenter Names: Kazi Tamim Nomany, Wei Chong, Shayla Cuatianquiz

Program & Institution: CSTEP / New York City College of Technology

Presentation Title: Detecting Software Vulnerabilities with Large Language Models: A Systematic Literature Review

Poster Authors: Kazi Tamim Nomany, Wei Chong, Shayla Cuatianquiz

Poster Category: Technology/Engineering

Abstract:

Large language models (LLMs) have emerged as a promising approach to software vulnerability detection. Traditional static analysis tools rely on predefined syntactic patterns, limiting their ability to identify complex, logic-based vulnerabilities that require semantic understanding of source code. In contrast, LLMs can analyze code semantically, enabling them to reason about program behavior in ways that resemble human code review while operating at scale. This literature review surveys recent research on LLM-based software vulnerability detection, focusing on three key aspects: (1) the LLMs and model families evaluated, (2) the datasets employed, and (3) the vulnerability types targeted. The reviewed literature shows that current research is concentrated around a small number of model families, including GPT-3.5/4 and the CodeBERT family, and a limited set of predominantly C/C++ datasets, such as BigVul and Devign. More recent studies have increasingly explored hybrid and retrieval-augmented approaches that incorporate additional contextual information to reduce false positives.

Despite promising benchmark results, the same model families often perform substantially worse under more rigorous evaluation settings, revealing limitations in their ability to generalize across diverse software environments. Overall, this review concludes that LLMs are valuable assistants for software vulnerability detection and vulnerability triage; however, current research remains constrained by benchmark dependence, limited dataset diversity, and inconsistent performance. These findings highlight the need for human-in-the-loop validation and more diverse, standardized benchmarks before LLM-based vulnerability detection can be reliably deployed in real-world software security.

Abstract Format

Presenter Names: Basma Alhusaini, Daianara Ferreras, Anieya Plaines, and Saba Alkobadi
Program & Institution: CSTEP / NYC College of Technology
Presentation Title: The Impact of Campus Climate on LGBTQ+ Student Success and Well-being
Poster Authors: Basma Alhusaini, Daianara Ferreras, Anieya Plaines, and Saba Alkobadi
Poster Category: Social Sciences

Type your abstract here:

This literature review examines the relationship between campus climate and the academic experiences of LGBTQIA+ students in higher education. The findings indicate that campus climate plays a significant role in shaping students' sense of belonging, academic persistence, mental health, and overall well-being. While students who feel supported and included are more likely to succeed academically, many campuses continue to reflect heteronormative and cisnormative norms that contribute to discrimination, exclusion, and minority stress. The literature also highlights disparities in safety, institutional support, and access to LGBTQ resources, particularly for transgender students and students with intersecting marginalized identities, such as LGBTQ students of color.

To address these gaps, this project proposes a mixed-methods study at New York City College of Technology (City Tech) using student surveys and interviews to better understand campus-specific experiences and institutional needs. The findings will provide evidence-based recommendations for improving campus climate and fostering a more inclusive, supportive, and equitable learning environment where all students can thrive and successfully complete their education.

Presenter Names: Kimberly McLaurin, Jamie Labriel
Program & Institution: CSTEP / NYC College of Technology
Presentation Title: DriveReplyAI: An AI-Powered Voice Assistant for Safer Driving
Poster Authors: Kimberly McLaurin, Jamie Labriel, Prof. Dr. Xiaohai Li
Poster Category: Technology/Engineering

Abstract

Distracted driving caused by mobile phone use remains a major contributor to traffic accidents. **DriveReplyAI** is an AI-powered Android application designed to improve road safety and accessibility by enabling drivers to manage text messages without touching their phones. The application detects incoming messages, reads them aloud using text-to-speech technology, and allows users to navigate and respond through simple voice commands.

Using a large language model (LLM), DriveReplyAI generates context-aware reply suggestions based on the content and tone of each message, allowing drivers to respond safely while keeping their hands on the wheel and eyes on the road. The project integrates Android notification services, speech recognition, natural language processing, and mobile application development to create an intelligent hands-free communication system.

This research demonstrates how artificial intelligence can reduce distracted driving while expanding accessibility for users who benefit from voice-first interaction. Future development aims to support additional messaging platforms and further enhance safety through intelligent automation.