



27th Annual UVI Undergraduate Research Symposium Program Booklet



September 27, 2026
Emerging Caribbean Scientists
College of Science and Mathematics
University of the Virgin Islands



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Emerging Caribbean Scientists

We invite you to UVI's

ANNUAL FALL UNDERGRADUATE RESEARCH SYMPOSIUM

**JOIN US ON SEPT 27TH
2026**

LOCATIONS:

St. Thomas

**CLASSROOM
ADMINISTRATION
BUILDING**

St. Croix

**SAINT CROIX:
RESEARCH
TECHNOLOGY
PARK**

TIME: 1PM - 3PM

FEATURING:

**Oral presentations, of research projects in
BIOLOGY, HEALTH, CHEMISTRY, COMPUTER
SCIENCE, ENGINEERING, MATH, ENVIRONMENTAL
SCIENCES, PHYSICS, PSYCHOLOGY AND MORE**



**University
of the Virgin Islands**

Table of Contents

Schedule	5
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Abstracts.....	8
Lomar Yearwood.....	8
<i>Tracking Reef Pathways Using Lagrangian Simulation and Connectivity Graphs</i>	
Mirza Baig & Kali Mills	9
<i>Ready but Unprepared: USVI Healthcare Professionals Support AI Adoption</i>	
Darin Connor	10
<i>Pixels, Panic and Paranoia: Social Media use and Perceptions of Crime in the US Virgin Islands</i>	
J'shaun Charles	11
<i>Evaluating the Effects of Stress Coat Application on Coral Health and Resilience</i>	
Lilian Alexander	12
<i>Random Walk Modeling of Coral Larvae Dispersal</i>	
Ford George	13
<i>Understanding the Virgin Islands Robotic Telescope(VIRT)'s Limiting Magnitude</i>	
Olivia Maldonado.....	14
<i>Synthesis of Novel 5-Bromo-Substituted 3-Amino-2-Substituted Isoquinolinones via an Optimized EDCI-Mediated Protocol</i>	
Yasmin Abdelghani	15
<i>Seasonal Particulate Matter Exposure in the Caribbean: Lessons from a Community-Led Monitoring Initiative in St. Croix, US Virgin Islands</i>	
Jekylah Richardson	16
<i>Design and Evaluation of an IoT-Based Irrigation Salinity Hardening System for Mangrove Nurseries</i>	
Kalani Simon	17
<i>Architecture and Development of a Multi-Agent System for Advising First Year Students</i>	
Ayaela-Elaine Louis-Riley and Jadine Davis	18
<i>Brief Stroke Education Improves Stroke Awareness and Healthy Behaviors Among Adults in the U.S. Virgin Islands</i>	
Christina Creque	19
<i>How does AI detect AI? The Anatomy of an AI detector</i>	
Emmanuel T. Roy	20
<i>The Evolution of Commercial Airlines</i>	
José Henry	21
<i>Determining Heartworm Prevalence in Shelter Intakes and Assessing Public Knowledge as a Driving Factor in St. Thomas</i>	

Jermaine Jones.....	22
<i>An Evaluation of Classification Algorithms for Diabetes Prediction</i>	
Lilian Alexander	23
<i>Mangrove Seedling Survival in GRROE USVI Mangroves Land-Based Nursery</i>	
Helen Ratchford	24
<i>Trematode Communities in Wetlands at Two Restored Sites in Central Illinois during Fall</i>	
Cameron Brookes	25
<i>An Artificial Intelligence (AI) Computing Research Assistant</i>	
Heba Jehad Ahmad	26
<i>Managing Medication Inventory and Supporting Patient Access: My Pharmacy Internship</i>	
Sumyah Mark	27
<i>Not All Disruptions Are Equal: The Impact of Hurricanes and the COVID-19 Pandemic on General Chemistry I Performance at UVI</i>	
Student Biographies.....	28
Acknowledgements.....	30

Schedule of Events

1:00 PM – Welcome (CAB302 & RTP 226)

1:05 PM – Keynote Speaker: Dr. Jendai Richards (CAB302 & RTP 226)

1:30 PM – Concurrent Sessions Begin

Session 1 (CAB303). Moderator: Destiny Coleman

Time	Student Name	Title	Subject	Institution	Mentor
1:30	Ayaela-Elaine Louis-Riley and Jadine Davis	Brief Stroke Education Improves Stroke Awareness and Healthy Behaviors Among Adults in the U.S. Virgin Islands	Biology, Genetics & Other Life Sciences	University of Miami	Deborah Jones and Sonjia Kenya
1:45	Heba Jehad Ahmad	Managing Medication Inventory and Supporting Patient Access: My Pharmacy Internship	Biomedicine & Other Health Sciences	Walgreens Pharmacy	Alice Stanford, Jonathan Marcellin
2:00	José Henry	Determining Heartworm Prevalence in Shelter Intakes and Assessing Public Knowledge as a Driving Factor in St. Thomas	Biomedicine & Other Health Sciences	The Humane Society of St. Thomas	Tracy Williams
2:15	Olivia Maldonado	Synthesis of Novel 5-Bromo-Substituted 3-Amino-2-Substituted Isoquinolinones via an Optimized EDCI-Mediated Protocol	Chemistry & Molecular Science	University of the Virgin Islands	Sarita Sitaula
2:30	Mirza Baig & Kali Mills	Ready but Unprepared: USVI Healthcare Professionals Support AI Adoption	Public Health	University of Miami Miller School of Medicine & UVI	Olveen Carrasquillo

Session 2 (CAB305 & RTP 129). Moderators: Mazharul Islam & Branalysa Varela

Time	Student Name	Title	Subject	Institution	Mentor
1:30	Kalani Simon (CAB 305)	Architecture and Development of a Multi-Agent System for Advising First Year Students	Computer Science & Technology	University of the Virgin Islands	Marc Boumedine
1:45	Jermaine Jones (CAB 305)	An Evaluation of Classification Algorithms for Diabetes Prediction	Computer Science & Technology	University of the Virgin Islands	Marc Boumedine
2:00	Christina Creque (CAB 305)	How does AI detect AI? The Anatomy of an AI detector	Computer Science & Technology	University of the Virgin Islands	Marc Boumedine
2:15	Cameron Brookes (RTP 129)	An Artificial Intelligence (AI) Computing Research Assistant	Computer Science & Technology	University of the Virgin Islands	Shamar Ward
2:30	Lilian Alexander (CAB 305)	Random Walk Modeling of Coral Larvae Dispersal	Data Science	University of the Virgin Islands	Robert Stolz

Session 3 (CAB306). Moderator: Emma Nani

Time	Student Name	Title	Subject	Institution	Mentor
1:30	Lomar Yearwood	Tracking Reef Pathways Using Lagrangian Simulation and Connectivity Graphs	Mathematics & Engineering	University of the Virgin Islands	Robert Stolz
1:45	Emmanuel T. Roy	The Evolution of Commercial Airlines	Aeronautics	Etelman Observatory	Bruce Gendre
2:00	Sumyah Mark	Not All Disruptions Are Equal: The Impact of Hurricanes and the COVID-19 Pandemic on General Chemistry I Performance at UVI	Mathematics & Engineering	University of the Virgin Islands	Bernard Castillo
2:15	Ford George	Understanding the Virgin Islands Robotic Telescope (VIRT)'s Limiting Magnitude	Physics & Astronomy	University of the Virgin Islands	B. Gendre; B. Orange; P. Gokul Dass
2:30	Jekylah Richardson	Design and Evaluation of an IoT-Based Irrigation Salinity Hardening System for Mangrove Nurseries	Mathematics & Engineering	GRROE USVI Mangroves Lab	Shamar Ward

Session 4 (CAB307 & RTP 226). Moderators: Marie Martin & Helen Ratchford

Time	Student Name	Title	Subject	Institution	Mentor
1:30	Lilian Alexander (CAB 307)	Mangrove Seedling Survival in GRROE USVI Mangroves Land-Based Nursery	Marine Biology & Environmental Sciences	University of the Virgin Islands	K. Wilson Grimes; A. Durdall; Z. Roper; K. Rommelfanger
1:45	J'shaun Charles (RTP 226)	Evaluating the Effects of Stress Coat Application on Coral Health and Resilience	Marine Biology & Environmental Sciences	The Nature Conservancy – Coral Innovation Hub	Yodi Philipos & Javier Soler
2:00	Darin Connor (CAB 307)	Pixels, Panic and Paranoia: Social Media Use and Perceptions of Crime in the US Virgin Islands	Psychology, Social Science & Humanities	University of the Virgin Islands	Angelina Prince
2:15	Yasmin Abdelghani (RTP 226)	Seasonal Particulate Matter Exposure in the Caribbean: Lessons from a Community-Led Monitoring Initiative in St. Croix, US Virgin Islands	Marine Biology & Environmental Sciences	Research and Technology Park	Bernard Castillo
2:30	Helen Ratchford (CAB 307)	Trematode Communities in Wetlands at Two Restored Sites in Central Illinois during Fall	Biology, Genetics & Other Life Sciences	Bradley University	John Marino

2:45 PM – Closing Remarks (CAB302 & RTP 226)

Abstracts

Tracking Reef Pathways Using Lagrangian Simulation and Connectivity Graphs **Lomar Yearwood**

Mentor: Dr. Robert Stolz

Mathematics & Engineering, University of the Virgin Islands

Coral reefs are vital marine ecosystems that protect our coastlines, support marine life, and sustain local fisheries and tourism across the U.S. Virgin Islands. However, accelerating climate change and disruptive human activities threaten these critical environments with severe degradation. To support local reef recovery and ecological resilience, this study examines the mechanisms of coral reef connectivity and larval dispersal across our local waters. By integrating real-world reef locations and ocean current data into a specialized simulation model combining advection-diffusion dynamics, stochastic particle tracking, and graph theory, this research maps larval transit corridors and identifies high-traffic ecological hubs across the reef network. The model successfully pinpoints key source reefs responsible for seeding neighboring areas as well as critical sink reefs, establishing a data-driven framework to guide targeted marine conservation and protection efforts in the USVI. Future work aims to build on these findings by incorporating real-time oceanographic data, seasonal climate variability, vulnerable reef identification, and larval mortality parameters.

Acknowledgments: Title III

Ready but Unprepared: USVI Healthcare Professionals Support AI Adoption

Mirza Baig & Kali Mills

Co-author: Terri Pietka, John Orr, Yue Pan PhD, Sonjia Kenya PhD, Olveen Carrasquillo MD MPH, Lashonette Schjang

Mentor: Dr. Olveen Carrasquillo

Public Health, University of Miami Miller School of Medicine, University of the Virgin Islands

Nationally, 87% of U.S. providers view artificial intelligence (AI) as useful Spatient care, yet less than half are trained in its use, and no data exist for the U.S. Virgin Islands (USVI). We assessed USVI healthcare professionals' perspectives on AI, including perceived usefulness, anxiety, and fear of replacement, and willingness to adopt it, predicting that usefulness would relate to greater willingness and fear of replacement to lower willingness. We administered a survey adapted from the Shinnars Artificial Intelligence Perception tool to 80 USVI healthcare professionals. It assessed demographics, AI use, familiarity, preparedness, and perceptions on a five-point Likert scale. Data were collected via Google Forms in June and July 2026 and analyzed with descriptive statistics and chi square tests. Respondents (76% female, 89% from St. Thomas) included nurses, physicians, and pharmacy and public health staff. Overall, 73% were willing to adopt AI, but only 43% had used it, 28% were familiar with it, and 41% felt prepared.

Perceived usefulness (60% vs. 85%) and anxiety about AI (52% vs. 82%) each related to willingness to adopt ($p < .05$); fear of replacement did not (68% vs. 75%). Overall, 76% cited lack of technological infrastructure and training as barriers. USVI professionals view AI positively and are willing to adopt it, but use, familiarity, and preparedness remain low. Expanding training and infrastructure, addressing anxiety, and demonstrating usefulness may facilitate adoption in geographically isolated regions. Funded by the CREW 2026 program and the USVI Department of Health.

Acknowledgments: NIH, USVI Department of Health, University of Miami Miller School of Medicine, University of the Virgin Islands

Pixels, Panic and Paranoia: Social Media Use and Perceptions of Crime in the US Virgin Islands

Darin Connor

Co-author: Angelina Prince

Psychology, Social Science & Humanities, University of the Virgin Islands

Despite declining official crime rates, fear of crime remains high and social media has become a primary source of crime-related information. Guided by Cultivation and Desensitization Theories, this study examined the relationship between social media use and perceptions of crime among adults residing in the United States Virgin Islands (USVI). It was hypothesized that greater social media use is associated with higher levels of fear of crime.

A quantitative cross-sectional survey was employed using convenience snowball sampling. Adults (N= 177) aged 18 years and older from St. Thomas, St. John and St. Croix completed an anonymous questionnaire that included the Social Media Use Scale (SMUS; consumption-based subscale) and the Fear of Crime scale. Data was analyzed using reliability analyses, Pearson correlation, independent-samples t test and linear regression.

The SUMS demonstrated strong internal consistency ($\alpha = .82$), while Fear of Crime demonstrated excellent reliability ($\alpha = .95$). Results revealed a weak but statistically significant positive relationship between social media use and fear of crime. $r(175) = .21$, $p = .005$. Linear regression indicated that social media use predicted fear of crime. No significant differences in fear of crime were observed within gender.

These findings suggest that social media use contributes to fear of crime among adults in the USVI, supporting cultivation theory stronger than desensitization theory. This study provides one of the first empirical examinations of social media and crime perceptions within the Caribbean and offers implications for media literacy initiatives, public communication strategies and future research in small island communities.

Evaluating the Effects of Stress Coat Application on Coral Health and Resilience

J'shaun Charles

Mentor: Yodi Philipos & Javier Soler

Marine Biology & Environmental Sciences, The Nature Conservancy- Coral Innovation Hub

Products designed for fish husbandry, like Stress Coat, are occasionally used in coral care despite limited evidence regarding their effectiveness. This experiment evaluated the effects of Stress Coat on 84 fragments of *Orbicella faveolata* and *Orbicella annularis* assigned to one of three treatment groups: a control group receiving no treatment, a standard-dose group, and a high-dose group. Corals were monitored over a four-week period using health scores, number of active tissue recession, bleaching, coloration, and mortality to assess changes in overall coral condition. Distinct differences in coral health were observed among the treatment groups throughout the experiment. These findings provide preliminary evidence that Stress Coat may affect coral health differently depending on concentration. By the conclusion of the experiment, corals receiving the standard Stress Coat dosage maintained higher overall health scores than both the control and high-dose groups, suggesting that dosage may influence coral response.

Acknowledgments: University of the Virgin Islands

Random Walk Modeling of Coral Larvae Dispersal
Lilian Alexander

Mentor: Robert Stolz, PhD
Data Science, University of the Virgin Islands

Coral reef connectivity depends on the dispersal of larvae by ocean currents, yet calculating these pathways is challenging from a computational stance. We present a random-walk model derived from an advection-diffusion (Fokker-Planck) equation to simulate larval dispersal across a reef network in St. Thomas, U.S. Virgin Islands. Directional transition probabilities are computed from current velocity fields and a constant eddy diffusivity, with softmax normalization validating probability distributions at each grid cell. Larvae released from individual reef sites are tracked and recorded stochastically over time to construct connectivity matrices. Future work will incorporate higher quality ocean currents and expanded reef datasets to refine connectivity estimates.

Acknowledgments: Title III Data Science

Understanding the Virgin Islands Robotic Telescope(VIRT)'s Limiting Magnitude Ford George

Mentor: Dr. Bruce Gendre; Dr. Brice Orange; Priyadarshini Gokul Dass
Physics & Astronomy, University of the Virgin Islands

Determining the exact limits of the 0.5-meter Virgin Islands Robotic Telescope (VIRT) is crucial for optimizing rapid transient follow-ups, especially for Gamma-Ray Bursts (GRBs). This study conducts VIRT's first site calibration by analyzing archived images from 2021 and 2022 across four color filters (B, V, R, and I) to find its limiting magnitude, which is the faintest apparent brightness from an object it can detect. Initial aperture photometry using AudeLA software ran into major data errors because it couldn't properly handle hazy tropical skies, and revealed significant Signal-to-Noise Ratio (SNR) anomalies; longer camera exposures incorrectly resulted in worse visibility rather than better. To resolve this, the analysis was switched to Simple Transient Detection for the Web (STDPIPE). This software utilizes a continuous background mesh to identify and ignore spatial noise variations, such as moonlight, preventing uneven bright spots from skewing median upper limits. STDPIPE successfully modeled the local atmospheric conditions and generated realistic results. Data from the Fall 2021 M74 target demonstrates that limiting magnitude appropriately scales with exposure time; in the red filter at an SNR of 5, a 10-second image yielded a limiting magnitude of 17.09, while a 150-second image deepened the limit to 18.77. This functional pipeline established a reliable seasonal baseline, allowing for the completion of VIRT's annual performance map so that astronomers can use the observatory with complete confidence. We plan to look at 2023-2024 observational data and performance next.

Acknowledgments: University of the Virgin Islands, National Space Foundation, National Aeronautics and Space Administration, OrangeWave, LLC

Synthesis of Novel 5-Bromo-Substituted 3-Amino-2-Substituted Isoquinolinones via an Optimized EDCI-Mediated Protocol

Olivia Maldonado

Co-author: Dr. Sarita Sitaula

Mentor: Dr. Sarita Sitaula

Chemistry & Molecular Science, UVI

Breast cancer remains a leading cause of cancer-related mortality globally, necessitating continuous development of targeted antineoplastic agents. Recent literature establishes first-generation 3-amino-2-substituted isoquinolinones as potent mitotic inhibitors that significantly inhibit cell growth and induce lethality in several NCI-60 cell lines, including triple-negative breast cancer (TNBC). This study investigates the synthesis and structural expansion of 5-bromo-substituted derivatives. We hypothesized that incorporating a heavy-atom 5-bromo handle onto a rigid, planar isoquinolinone core would optimize binding within hydrophobic pockets of mitotic motor proteins. The synthetic methodology utilized 5-bromo-2-(cyanomethyl)benzoic acid precursors reacted with substituted acyl hydrazides through a modified two-stage cyclization protocol. Specifically, this approach employed 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDCI), 4-dimethylaminopyridine (DMAP), and imidazole·HCl as a catalytic promoter in acetonitrile solvent. Reaction products were isolated via selective precipitation and will be characterized using standard spectroscopic techniques, including nuclear magnetic resonance (NMR) spectroscopy. The optimized EDCI-mediated protocol successfully afforded novel 5-bromo-substituted isoquinolinone derivatives in moderate to high yields without requiring chromatography. Functioning as a versatile privileged scaffold, this flat cis-enamide architecture effectively mimics peptide sequences to disrupt protein-protein interactions during cell division. Given their potent growth inhibition against aggressive breast cancer lines, future biological evaluations will probe tubulin dynamics to clarify their precise intracellular mitotic mechanism. This research is supported in part by institutional and departmental funding sources.

Acknowledgments: Institutional and departmental funding sources, Dr. Jason Abrams

Seasonal Particulate Matter Exposure in the Caribbean: Lessons from a Community-Led Monitoring Initiative in St. Croix, US Virgin Islands

Yasmin Abdelghani

Co-author: Zoe Price

Mentor: Dr. Bernard Castillo

Marine Biology & Environmental Sciences, Research and Technology Park

Air quality is an important environmental and public health concern because airborne pollutants and particulate matter can negatively affect human health and surrounding ecosystems. In the U.S. Virgin Islands, air quality can be influenced by several sources, including smoke, vehicle emissions, and Saharan dust transported across the Atlantic Ocean, which commonly reaches the region during the summer months. The main objective of this study was to establish a community-led air-quality monitoring system through the Terra Ay Ay Environmental Action Group and examine particulate matter levels across St. Croix, U.S. Virgin Islands. PurpleAir monitors were installed at 12 locations throughout the island to continuously measure air quality and provide the community with access to real-time environmental data. This study focused on fine particulate matter (PM_{2.5}), which consists of airborne particles that can originate from sources such as smoke, vehicle emissions, and transported dust. Air-quality data were collected from February 2024 through April 2025 to evaluate changes in PM_{2.5} concentrations over time and identify seasonal patterns. Results showed that PM_{2.5} concentrations ranged from approximately 7–18 ppm with higher concentrations generally observed between May and August and lower concentrations between September and December. The installation of the PurpleAir monitors provided the community with accessible, real-time air-quality information and increased awareness of local environmental conditions. Overall, this study demonstrates the value of community-based air-quality monitoring for identifying seasonal particulate matter patterns and providing information that can support environmental awareness and public health in St. Croix.

Acknowledgments: This project has been funded by the United States Environmental Protection Agency under assistance agreement 96241922 to St Croix Foundation.

Design and Evaluation of an IoT-Based Irrigation Salinity Hardening System for Mangrove Nurseries
Jekylah Richardson

Co-author: GRROE USVI Mangroves Lab

Mentor: Dr. Shamar Ward

Mathematics & Engineering, GRROE USVI Mangroves Lab

Mangroves are a unique class of plants that are adapted to survive in highly saline conditions. These beautiful plants thrive in shallow water and sub-tropical coastal environments and serve as a protective coastal buffer against strong tidal activity formed from hurricanes. In the US Virgin Islands, there are three true mangrove species: the red mangrove (*Rhizophora mangle*), the black mangrove (*Avicennia germinans*), and the white mangrove (*Laguncularia racemosa*). At the GRROE USVI Mangroves lab, the mangrove seedlings undergo a process called hardening - the gradual transition from watering exclusively with freshwater to incrementally increasing salinity exposure to prepare for transplanting into natural mangrove environments. The process is done manually, making it difficult to keep the hardening water at a constant salinity percentage over time, which can cause immense stress on the seedlings and negatively impact the survival percentage of the hardening mangrove. In our work, we designed an IoT-Based Irrigation Salinity Hardening System to automate the hardening process for red mangrove seedlings. Our system can monitor and automatically adjust the salinity of the water being applied to plants over time. Our system comprises of a Raspberry Pi microcontroller, peristaltic pump, TDS sensor, pH sensor, turbidity sensor, and motor drivers to measure and set a specific salinity percentage for the water used to harden the red mangrove seedlings. This work is currently in progress yet aims to reduce manual human labor and to provide a constant, accurate salinity percentage at different levels throughout the mangrove hardening process.

Acknowledgments: GRROE USVI Mangrove Lab

Architecture and Development of a Multi-Agent System for Advising First Year Students

Kalani Simon

Mentor: Dr. Marc Boumedine

Computer Science & Technology, University of the Virgin Islands

Academic advising is crucial in undergraduate success; however, it is most crucial for first year students. However, traditional advising is met with several challenges such as low engagement, especially by first year students. My research aims to address the issue by designing and implementing a multi-agent system prototype to assist users during the advising process. The prototype has been developed on Google AI agentic development platform, and knowledge extracted from the current UVI undergraduate catalogue. This preliminary prototype focuses on first year students enrolled in the Computer Science program. The system is comprised of one conversational agent, and 3 functional agents. The system performed its duties by providing correct advisement without significant issues such as hallucination or inaccuracy. This system does not and should not aim to entirely replace traditional advising but support existing advisors and offer easy access advising assistance to students. The system can be improved to further expand its use.

Acknowledgments: U.S. Department of Education: Title III Parts B & F, Strengthening Historically Black Colleges and Universities Program

Brief Stroke Education Improves Stroke Awareness and Healthy Behaviors Among Adults in the U.S. Virgin Islands

Ayaela-Elaine Louis-Riley and Jadine Davis

Co-author: Co-Author- Nancy Phillistin

Mentor: Dr. Deborah Jones and Dr. Sonjia Kenya

Biology, Genetics & Other Life Sciences, University of Miami

Cardiovascular disease poses a serious health problem in the U.S. Virgin Islands, where the traditional diet is often high in starchy foods, which may increase cardiovascular risks. Strokes are a disease that can occur because of alterations in blood circulation to the brain. Modifiable risk factors of stroke include hypertension, unhealthy eating habits, and lack of exercise. Common autoimmune skin diseases such as psoriasis and vitiligo are also associated with cardiovascular health, meaning it is important to observe these connections. This study evaluated the effectiveness of a short educational video aimed at increasing awareness about stroke. A total of 26 participants were surveyed before and after the educational video module during a community screening on the island of St. Thomas. Participants had to fill out a pre-survey before the screening, watch the educational video, and complete a post-survey after the screening session. The educational video was centered on the risks associated with stroke, high sugar diets, and skin problems. The video also encouraged practicing stroke prevention behaviors as well as informing viewers of warning signs and what to do in the event of someone experiencing a stroke. After watching the video, scores among participants improved by 30% in important areas such as identifying stroke risk factors and by 27% in willingness to practice preventative behaviors. Participants also indicated that they had understood the correlation between skin disorders and stroke. The study revealed positive results proving that brief videos can significantly raise awareness about stroke among people in the U.S. Virgin Islands.

Acknowledgments: National Heart, Lung, and Blood Institute (NHLBI) grant R25HL168793

How does AI detect AI? The Anatomy of an AI detector

Christina Creque

Co-author: Marc Boumedine

Mentor: Marc Boumedine

Computer Science and Computational Sciences Department, UVI

The rapid development and increased accessibility of artificial intelligence (AI) have led to widespread use, especially among students. Students now utilize AI to generate essays, code, and complete tests, which has led to educators employing AI detectors to determine academic dishonesty, and deter students from unauthorized use. However, AI detectors are prone to errors, especially regarding false positives which may punish higher-level writers, and those who utilize instructor-vetted grammar checkers. This study evaluates the underlying structural components of trivial agent-generated text detectors and outlines the implementation of a surface linguistic feature-based AI detector using free machine learning frameworks. This work addresses whether simple agent-based automated detectors possess the diagnostic accuracy required to serve as the primary tool to determine academic integrity. The Mann-Whitney U test confirmed a significant difference in the assigned AI probability scores for AI-generated and student-authored texts, with higher assignments to AI-generated text ($U = 462.5$, $p = 0.0003$) with a large effect size ($r = .52$). The median detection score for AI-generated text ($Mdn = 0.90$) was substantially higher than the median score for human authored text ($Mdn = 0.16$), indicating that combined AI score distribution is shifted higher than the human distribution. The ROC-AUC (Receiver Operating Characteristic - Area Under the Curve) analysis informed us on the quality and accuracy of the agent, and the best results are obtained with an 80% threshold for increased precision. The confusion matrix metrics shows 25% of false positives (falsely accusing the students of using AI). This trivial agent design architecture provides initial baseline data. However, it relies heavily on a single, monolithic model (Gemini API) to make a verdict based on basic syntax metrics. The design is then augmented with an asymmetric agent to avoid a potential drift while ensuring the instructor is kept in the loop when a verdict does not meet a safe threshold.

Keywords: Academic integrity; AI-generated text; Agent-based text detection; probability scores; Precision; Mann-Whitney U test

Acknowledgments: *U.S. Department of Education: Title III Parts B & F, Strengthening Historically Black Colleges and Universities Program*

The Evolution of Commercial Airliners

Emmanuel T. Roy

Mentor: Dr. Bruce Gendre

Aeronautics, Etelman Observatory

In a world where everything and everyone seems so far away, aviation has made everything seemingly closer. In a world where we can fly from New York City to Singapore (the world's longest flight) in under a day is very awe-inspiring. To think that many people from various countries can engineer and manufacture various aircraft that can fly those long distances over a long period of time is even mind boggling. We will understand how the components of an aircraft work together to allow it to operate, and how it is possible to get a big metal tube with big metal wings, essentially, in the air to fly from one place to the next. There may be many questions with many answers but first it is important to look at where aviation first started to where we are now. To really understand how planes fly and work, we will look at the mechanics of airplanes and the evolution of those mechanics over the years.

Determining Heartworm Prevalence in Shelter Intakes and Assessing Public Knowledge as a Driving Factor in St. Thomas

José Henry

Co-author & Mentor: Dr. Tracy Williams

Biomedicine & Other Health Sciences, The Humane Society of St. Thomas

Heartworm disease, caused by the parasitic nematode *Dirofilaria immitis*, is a major mosquito borne threat to domestic animals in tropical regions like St. Thomas. For my study, I evaluated heartworm prevalence among shelter intake dogs while looking at whether public knowledge gaps contribute to sustained transmission across the island. Clinical testing at the shelter reveals a consistently high prevalence of heartworm disease, and that gaps in public knowledge could be part of the issue. Alongside Dr. Williams and the other medical staff during shelter shifts, incoming dogs aged six months and older were examined for diagnostic testing. Across the 94 heartworm tests conducted at the shelter in 2026 so far, 51.1% (48/94) returned positive results for adult heartworm antigens, with 54.2% (26/48) of those positive tests harboring active circulating microfilariae on wet mount examination. Historical records confirmed consistently elevated infection rates across prior years. The survey revealed major gaps in general disease knowledge that likely contribute to these sustained rates: 42% of respondents did not know mosquitoes spread heartworms, 37% admitted to administering preventative care rarely or being unsure of the schedule, and 55% were unaware of feline susceptibility. The results obtained shows that high shelter prevalence is closely linked to widespread community misconceptions, highlighting the need for comprehensive public health education.

Acknowledgments: The Humane Society of St. Thomas

An Evaluation of Classification Algorithms for Diabetes Prediction

Jermaine Jones

Mentor: Marc Boumedine

Computer Science & Technology, University of the Virgin Islands

Diabetes mellitus is a major health condition that poses a threat to many people in the United States. It develops when the pancreas is unable to produce enough insulin, or any at all. When untreated, diabetes can lead to serious conditions including vision loss, heart disease, and nerve damage.

Previous research has been conducted to test whether it is possible to analyze patient information to predict diabetes early to prevent serious health issues. These approaches use machine learning algorithms such as logistic regression, k-nearest neighbors (KNN), and Random Forest to determine if a patient has a risk or no risk of becoming diabetic. This work was conducted by implementing these algorithms on a dataset originating from a Kaggle competition. This data contains information related to diabetes risk factors and associated health metrics. It contains 10,000 patient records along with demographic and physical measurements. Because the dataset did not originally have a diabetes outcome, the fasting blood glucose and HbA1c were used as predictors to determine the ground truth. The data was cleaned and pre-processed before being divided into training and test sets. The models generated by the algorithms were then evaluated using three criteria: precision, recall, and F1-score. Based on the experiments, Random Forest achieved the highest performance for each of the criteria. The results suggest that Random Forest performed best at distinguishing between the two outcomes. However, this study was limited because only two predictors were considered in these experiments.

Acknowledgments: This material is based upon work supported by the National Science Foundation, Award Number: 2219731| Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation Research institution: University of the Virgin Islands University: University of the Virgin Islands Computer and Computational Science Department

Mangrove Seedling Survival in GRROE USVI Mangrove's Land-Based Nursery
Lilian Alexander

Mentor: Kristin Wilson Grimes, PhD, Allie Durdall, Zola Roper, Kaitlin Rommelfanger
Marine Biology & Environmental Sciences, University of the Virgin Islands

Mangroves provide critical habitat while stabilizing shorelines and protecting coastal communities from erosion and storm surge. Following extensive damage from Hurricane Irma in 2017, mangrove restoration has become a conservation priority in the U.S. Virgin Islands, with nursery facilities commonly used to grow resilient seedlings prior to outplanting. While previous studies have identified factors such as maternal genotype, intertidal elevation, and insect damage as influences on mangrove seedling survival in field settings, nursery specific research on the propagule traits driving seedling success remains limited. This study examined how red mangrove propagule traits such as mass, plumule length, total length, and condition influence seedling survival in a nursery setting. Mangrove intake data from the GRROE USVI Mangroves Lab of the University of the Virgin Islands were condensed and analyzed in Python using supervised machine learning. Multiple logistic regression models were compared using AIC, and classification performance was evaluated with a confusion matrix heatmap. The final model retained mass, storage time, and collection site as significant predictors for outplanting suitability, while plumule length and total length did not improve model fit. Heavier propagules and shorter storage times were associated with significantly higher odds of survival, and survival odds varied significantly by site: Salt River Bio Bay in St. Croix, and STEER Fringe and Vessup Bay in St. Thomas had the highest odds, while Annaberg Bay and Lameshur in St. John, and Magens Bay and Perseverance Bay in St. Thomas had the lowest. These findings suggest propagule mass, storage duration, and site selection should guide nursery restoration practices.

Acknowledgments: NSF SEAS Islands Alliance, Virgin Islands Center for Autonomous Research programs

Trematode Communities in Wetlands at Two Restored Sites in Central Illinois during Fall **Helen Ratchford**

Co-author: David Estrada

Mentor: John Marino

Biology, Genetics & Other Life Sciences, Bradley University

Parasites, though often understudied, play critical roles in shaping community structure by regulating populations, mediating competition, and contributing substantially to food webs. One common group of parasites are trematodes, which are flatworms with complex life cycles involving multiple hosts. This study examined trematode communities in two restored wetlands in central Illinois, Banner Marsh State Fish and Wildlife Area and Emiquon Nature Preserve, during fall, a season that has received less attention than summer. Six snail surveys were conducted between September and November in 2024 and 2025, targeting known trematode hosts *Physa gyrina* and *Planorbella trivolvis*. Snails were screened for infection using microscopy, yielding 53 infections; parasites from 7 snails were further analyzed using DNA extraction, PCR, and sequencing. In Banner Marsh, prevalence (the proportion of snails that were infected) peaked at approximately 17% in November. At Emiquon, prevalence peaked at 10% in late September before falling to 7% in November. Morphological and molecular analyses revealed echinostomes as the dominant parasite group (78.15% of infections), which is notable as this group includes important parasites of amphibians and other vertebrates. These findings indicate a significant presence of trematodes at these sites in fall and support the value of monitoring parasites as indicators of ecosystem health at different times of year. Future research should examine infection in other hosts (e.g., amphibians, waterfowl) to more fully understand seasonal dynamics and trematode transmission within these restored habitats.

Acknowledgments: Bradley University

An Artificial Intelligence (AI) Computing Research Assistant
Cameron Brookes

Mentor: Shamar Ward
Computer Science & Technology, UVI

Students often have difficulty during the research process. Students often find it difficult to create research titles, narrow topic areas, and create targeted research questions. This work seeks to determine if chatbots can be used to help students refine their research titles before submission by providing a rating of 0 to 5. In our study, we evaluated the ability of popular chatbots ChatGPT and Claude to provide grades to students that are in line with the rubric and professors grading. To do this we compared 90 student responses containing instructors scores with the grading provided by both ChatGPT and Claude. We then assessed these scores using the Intraclass Correlation Coefficient (ICC) and the Quadratic Weighted Kappa (QWK) and compared the performance between ChatGPT and Claude. In the end, we found that while ChatGPT and Claude were able to provide scores that were in high agreement with each other, neither provided adequate agreement with the instructor grading. Due to their lack of agreement with instructor feedback under the metrics of both the ICC and the QWK it is apparent that neither of these LLMs can be trusted to reliably generate accurate feedback.

Acknowledgments: Increasing Data Science

Managing Medication Inventory and Supporting Patient Access: My Pharmacy Internship

Heba Jehad Ahmad

Mentor: Dr. Alice Stanford, Dr. Jonathan Marcelin
Biomedicine & Other Health Sciences, Walgreens pharmacy

My pharmacy internship focuses on medication inventory management and helping patients receive their prescribed medications. This poster will summarize the work I have completed so far, the knowledge I have gained, and my plans for the remainder of the internship.

My responsibilities include receiving medication shipments, placing medications in their correct locations, checking out-of-stock lists, and confirming whether missing medications have been ordered. I also use the pharmacy system to locate medications and check shipment information. One area of focus is following up on medications that have been unavailable for more than five days.

Under pharmacy staff supervision, I help review patient profiles to identify refill needs and prescriptions that require follow-up with a doctor. I am also learning how pharmacy staff coordinate with patients and prescribers when a medication is unavailable, including discussing possible alternatives and obtaining a new prescription when needed.

Through these tasks, I am building my understanding of medication names, uses, ingredients, and storage requirements. I am learning how accurate inventory records and clear communication support medication availability and patient care. My weekly internship reports document my activities, learning, and progress.

During the rest of my internship, I plan to strengthen my medication knowledge, improve my inventory management skills, and gain more experience following up on medication shortages. My final report will bring together these experiences and reflect on what I have learned.

Acknowledgments: No external research funding was received.

Not All Disruptions Are Equal: The Impact of Hurricanes and the COVID-19 Pandemic on General Chemistry I Performance at UVI

Sumyah Mark

Mentor: Dr. Bernard Castillo

Mathematics & Engineering, University of the Virgin Islands

Institutions in disaster-prone regions face repeated disruptions to instruction, yet how different kinds of disruption affect student learning remains poorly understood. The University of the Virgin Islands experienced two major disruptions within a decade: Hurricanes Irma and Maria in 2017 and the COVID-19 pandemic beginning in 2020. This study asked how these events affected student performance in CHE 151 (General Chemistry I) and whether recovery differed between a natural disaster and a pandemic. Eleven years of objective-level assessment data (Fall 2015–Fall 2025) were analyzed, comparing class mastery across disruption eras, with three key semesters compared using the Shapiro-Wilk test, Kruskal-Wallis test, Mann-Whitney U tests with Bonferroni correction, and Cohen's d effect sizes. Second-year post-hurricane performance (Fall 2019, 67.2%) significantly exceeded post-COVID performance (Fall 2022, 59.0%; Mann-Whitney U, $p = 0.005$, $d = 0.59$, medium effect), and Kruskal-Wallis confirmed significant differences across semesters ($p = 0.031$). Stoichiometry emerged as a persistent weakness, scoring below 50% in most semesters, including pre-disruption baselines. These findings indicate that COVID-19 produced a deeper and longer-lasting decline in chemistry performance than the hurricanes, suggesting pandemic recovery requires more sustained instructional support, while persistent stoichiometry deficits independent of any disruption reveal a structural curricular need warranting targeted intervention.

Acknowledgments: Biomedical Expansion Grant - 200846; Title III; University of the Virgin Islands

Student Biographies

Lomar Yearwood

My name is Lomar, and I am from St. Kitts with a background in Agricultural Science. I am currently pursuing a Bachelor of Science in Computer Science at the University of the Virgin Islands, with a concentration in Cybersecurity. I enjoy learning new things, exploring technology, and pursuing photography as a side hustle.

Kali Mills

Kali Mills is a recent graduate of the University of the Virgin Islands, where he earned a Bachelor of Science in Computer Science with a concentration in Computational Biology. He aspires to build a career around data science while contributing innovative ways to benefit his home territory.

Mirza Baig

My name is Mirza Baig, an undergraduate student at the University of the Virgin Islands pursuing a Bachelor of Science in Biology. I am very skilled in AI and have created several helpful tools, such as SATified.org and Climasafe. I am on the premedical track, aiming to become a skilled ophthalmologist.

Ford George

Ford George is an astrophysics student at the University of the Virgin Islands. She conducts observational research utilizing the Virgin Islands Robotic Telescope at Etelman Observatory, a facility she has been working with since the age of 15.

Yasmin Abdelghani

Yasmin Abdelghani is a junior nursing student at the University of the Virgin Islands on St. Croix. She has a strong interest in health, environmental science, and research, and has participated in projects examining environmental factors that affect community health. Through her research experiences, Yasmin hopes to continue developing her scientific skills while preparing for a career in nursing and serving her community.

Jekylah Richardson

Jekylah Richardson is a sophomore at the University of the Virgin Islands. She is majoring in UVI's Applied Mathematics 3-2 program for Electrical Engineering. Over the summer, she worked on a research project on an IoT automated Mangrove Hardening System that has continued into her fall semester.

Ayaela-Elaine Louis-Riley

My name is Ayaela-Elaine Louis-Riley. I am a fourth-year biology major at the University of the Virgin Islands and I aspire to become a dermatologist.

Jadine Davis

Jadine Davis, was born and raised in the Virgin Islands. Jadine is a pre-nursing student at the University of the Virgin Islands. She is strongly interested in public health and healthcare policy. Jadine's long-term goal is to contribute to healthcare initiatives and policies that improve access to quality care across communities.

Emmanuel T. Roy

I am Emmanuel T. Roy. I am a Physics major with a passion for aviation and a desire to be a commercial pilot. Studying Physics at the University of the Virgin Islands provides me with a broad background of conceptualization in Physics that is favored in the aviation world.

José Henry

My name is José Henry an undergraduate student at the University of the Virgin Islands pursuing a bachelor's degree in biology and minor in Health Sciences. As an intern at the Humane Society of St. Thomas, I conducted diagnostic screenings on shelter dogs and distributed community surveys to analyze regional heartworm rates and public awareness. Following graduation, I plan to pursue a career in Large Animal Veterinary Medicine.

Jermaine Jones

My name is Jermaine Jones, and I am a 20-year-old student at the University of the Virgin Islands. I was born and raised in the Virgin Islands. I am a junior currently majoring in computer science and have done research in data science.

Helen Ratchford

Helen Ratchford was born and raised on St. Thomas in the U.S. Virgin Islands. She graduated from Bradley University in Peoria, Illinois in May 2026 with a bachelor's in biology and political science. Her research in undergrad focused mainly on frog, snail, and parasite interactions in central Illinois wetlands. Helen has joined the MMES program and will be studying bat ectoparasites with Dr. Marianne Moore.

Cameron Brookes

My name is Cameron Brookes I am a student at the University of the Virgin Islands on the AAS campus. Currently, I am in my senior year as a Computer Science student. Once I graduate, I plan to find relevant work within the territory.

Sumyah Mark

Sumyah Mark is a sophomore Biology major, pre-medical student, and NASA Space Grant Fellow at the University of the Virgin Islands. Under the mentorship of Dr. Bernard Castillo, she studies how major disruptions (the 2017 hurricanes and the COVID-19 pandemic) affected student learning in General Chemistry I, drawing on eleven years of assessment data and a range of statistical methods. She is also committed to STEM education and outreach in the Virgin Islands community. She aspires to become a physician-scientist, integrating clinical medicine with research into disease mechanisms, particularly those of viral infection and spaceflight-induced pathology.

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- ❖ Marie Martin
- ❖ Emma Nani
- ❖ Helen Ratchford
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