IEEE MIT Undergraduate Research Technology Conference 2022
Technical Paper Oral Presentation Schedule

	Saturday, October 1, 2022 Stata Center 32-123 Machine Learning / Artificial Intelligence (AI) Track #1 Track Chair: Aisha Yousuf	
EST TIME	**PAPER TITLE**	**PRESENTERS**
10:30AM	**ID-22** Cognitive Profiling and Personalized Therapy Recommendation for Dementia through a Language Aware Multi-Model Artificially Intelligent System	**Kosha Upadhyay** (Bellevue High School)
10:40AM	**ID-27** Determining the Impact of Socioeconomic Status on Athletic Performance Using Machine Learning	**Zachary J Hale, Ria Shah, Thea L Spellmeyer, Emma S Savov** (Rutgers University)
10:50AM	**ID-43** Using Machine Learning to Predict Injury Risk From Athlete Kinetic Patterns	**Nekita Thaker, Clayton Tomlinson, Ankita Kundu, Emma Schrier, Logan Peek** (Rutgers University)
11:00AM	**ID-49** Convolution Neural Network on BeagleBone Black Wireless for Machine Learning Applications	**Amer Qouneh, Jeremy Bogacz** (Western New England University)
11:10AM	**ID-56** An Analysis of Implementing a GAN to Generate MIDI Music	**Niko C Kopparapu, Milo Ferrara, Sofia Arora, Thomas Earls** (Rutgers University)
11:20AM	**ID-60** A Reciprocity-Based Method for Improving Community Detection on Directed Friendship Networks	**Samuel A Feuer** (Wesleyan University); **Wyatt Hopkins** (Wentworth Institute of Technology); **David Rollo** (Utah State University)
11:30AM	**ID-64** A Secure and Reliable Mobile Authentication Alternative Utilizing Hand Structure	**Danielle K Park, Reva Hajarnis, Alexei Korolev, Sahil Chatiwala, David L Shenkerman** (Rutgers University)
11:40AM	**ID-76** Symbolic Math Reasoning with Language Models	**Vedant Gaur** (Aragon High School)
11:50AM	**ID-79** Are Fair Learning To Rank Models Really Fair? An Analysis Using Inferred Gender	**Alexander Pietrick** (Worcester Polytechnic Institute); **Shailen Smith** (Stony Brook University)
12:00PM	**ID-62** (IN-PERSON & VIRTUAL) Implementing Transformer Architectures for Audio Source Separation	**Ayush Agarwal, Brian Li, Neha L Peddinti, Yunbing Qian, Vinay G Menon, Devin S Torres, Sabar Dasgupta** (Rutgers University)
12:10PM	**ID-82** (*VIRTUAL*) Modeling Misinformation With Q-Learning, Nim, and Multi-Agents	**Elijah Huang** (University of California Irvine)

AM TRACK #1

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	Saturday, October 1, 2022 Stata Center 32-141 Computer Systems, Theoretical Computer Science and Maths Track Security and Communications Track Track Chair: Ali Abedi	
EST TIME	**PAPER TITLE**	**PRESENTERS**
10:30AM	**2021 ID-52** **A Novel Method for Protein-Protein Interface Analysis Using Sonification**	**Sophia E Meytin** (Dartmouth College)
10:40AM	**ID-7** **Determining the most ideal practical quantum decoherence-reduction method by extracting superconducting qubit coherence rates in a Qiskit Pulse program and IBM's Pulse Program**	**Tanek Swain** (Academy of Science)
10:50AM	**ID-46** **Analyzing Error Distributions of Quantum Noise on Cloud-Accessible IBM Quantum Computers**	**Alexander B Noviello, Brandon Stobie, Yamato Hara** (Drew University)
11:00AM	**ID-58** **On the Computability of the Ninth Dedekind Number**	**William Fang** **(Boston University)**
11:10AM	**ID-41** **EnsembleDroid: A Malware Detection Approach for Android System based on Ensemble Learning**	**Sharon Guan** (New York Institute of Technology)
11:20AM	**ID-48** **Performance Comparison of Machine Learning Methods in DDoS Attack Detection in Smart Grids**	**Edwin D Meriaux** (Umass Lowell)
11:30AM	**ID-51** **Image Dilution using Harris Corner Detection and Geometric Kernels**	**Aiden M James** (University of North Carolina at Charlotte)
11:40AM	**ID-23** **(VIRTUAL)** **Adding Virtual Reality Annotation Software for Education-Technology**	**Ayush Agarwal** (BASIS Independent Silicon Valley)
11:50AM		
12:00PM		
12:10PM		

AM TRACK #2

	Saturday, October 1, 2022 Stata Center 32-155 BioEECS and Applied Physics Track, Circuits, Materials, and Nanotechologies Track **Track Chair: James Byleckie**	
EST TIME	**PAPER TITLE**	**PRESENTERS**
10:30AM	**ID-35** **A Miniaturized ISFET-Based Blood pH Sensing Device for Home Care Use**	**Evan J Buckley, Joshua Geyster, Benjamin Larkin** (Worcester Polytechnic Institute)
10:40AM	**ID-6** **Quantum Algorithm for the Simulation of Squamous Cell Lung Carcinoma Tested through IBMQ**	**Akshita Tiwari** (Academy of Science)
10:50AM	**ID-44** **Mimicry of skeletal muscle tissue with layered phantom for ultrasound imaging**	**Hayoung Cho** (Boston College)
11:00AM	**ID-50** **COD-FISH: Contrastive Oligonucleotide Design for Fluorescence In-Situ Hybridization to Detect Single RNA Molecules with High Specificity**	**Devisi Goel** (Horace Greeley High School); **Sanjay Tyagi** (Rutgers University)
11:10AM	**ID-55** **Development of Motor-assisted therapy bike for patients with Parkinson's Disease**	**Emma Lokey** (University of Rhode Island)
11:20AM	**ID-57** **SixthSense: A Wearable Ultrasonic System with Haptic Feedback for Visually Impaired Individuals**	**Kaitlyn R Lum, Olivia Wojnilo** (University of Rhode Island)
11:30AM	**ID-66** **A Multifactorial Correction Method for Tumor Mutation Burden**	**Anna M Konvicka** (The Cooper Union)
11:40AM	**ID-31** **Demystifying Quantum Materials with Deep Learning and Angle-Resolved Photoemission Spectroscopy**	**Eric Sun** (The Loomis Chaffee School)
11:50AM	**ID-52** **Effect of Layer Thickness and Orientation of 3D Printed Parts on the Mechanical Properties**	**Jonathan Slohoda, Tyler D Harwood** (Rutgers University)
12:00PM	**ID-53** **Antimicrobial Assessment of Cellulose-Copper-Silica Nanocomposites for Crop Disease Management**	**Marco A Rojas-Cessa** (Columbia University)
12:10PM	**ID-34 (VIRTUAL)** **An EEG-Based Diagnostic Framework for Strokes Using Spectral Analysis and Deep Learning**	**Rohan Kalahasty,** **Lakshmi Sritan R Motati** (Thomas Jefferson High School)

AM TRACK #3

	Saturday, October 1, 2022 Stata Center 32-123 Robotics and Controls Track, Space Application and Technologies Track Track Chair: (Sreeram Dhurjaty)	
EST TIME	**PAPER TITLE**	**PRESENTERS**
1:30PM	**ID-2** JARVITS: A Novel Deep Learning IoT Traffic Control System for Real-time Detection and Signal Optimization	**Ryan Kim** (Choate Rosemary Hall)
1:40PM	**ID-25** Automatic Control of a Soft Trunk Robot Actuated by Strings	**Leonardo Garofalo** (University of Rhode Island)
1:50PM	**ID-26** Role of SysML in Integrating an Interdisciplinary Team	**Kleo Golemi** (Worcester Polytechnic Institute)
2:00PM	**ID-39** Analysis of the Optimal Adjustment Frequency for a Dual-Axis Solar Tracker	**Adham S Ibrahim, Samuel Lihn, Jenna Mullin, Nicholas Gibson** (Rutgers University)
2:10PM	**ID-42** Reasoning the Trust of Humans in Robots through Physiological Biometrics in Human-Robot Collaborative Contexts	**Tiffany Guo** (Cornell University)
2:20PM	**ID-78** UAV and UGV Autonomous Cooperation for Wildfire Hotspot Surveillance	**Diego Pasini, Charles D Jiang** (The Pingry School)
2:30PM	**ID-45** Producing a Flight Profile for Drone-Based Zero Gravity Experiments with a Python Script	**Adam Bathurst, Amy Zheng, Ashna Jain, Sania Moghe** (Rutgers University)
2:40PM	**ID-81** Conceptual design of an Experimental rocket with Variable Diameter stages: Stability and Effects on the Drag Coefficient	**Johan J. Nuñez-Quispe** (Universidad Nacional de Ingeniería)
2:50PM	**ID-29** (Security & Communications Track) A Novel Approach to Secure Smartwatch Authentication: Structure-Borne Sound Identification and Gesture Recognition	**Andrew C Noviello, Fadi Farag, Aashi Mishra, Sophia Fu, Aashika Jagadeesh** (Rutgers University School of Engineering)
3:00PM	**ID-67 (IN-PERSON & VIRTUAL)** Improving the Performance of Computer Vision Algorithms for the Multi-Mode Hybrid Drone Delivery System	**Chelsy Goodwill, Alexander Dong, Ronald Leung, Kareena Shah** (Rutgers University)
3:10PM	**ID-24 (VIRTUAL)** Kinematic Controller of a Soft Continuum Robot Using Learned Forward Models	**Anirudh Mazumder** (University of Cambridge); **Aditya Singh** (Cambridge Center for International Research)

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1:30PM	**ID-5** (VIRTUAL) Automated Online Proctoring System Using Gaze View Tracking and Custom Object Detection	**Brian Li, Emma Li** (Mission San Jose High School)
1:40PM	**ID-8** (VIRTUAL) A Vietnamese Named Entity Recognition System for COVID-19 Articles	**Ngoc N Hoang** (New York University Abu Dhabi)
1:50PM	**ID-9** (VIRTUAL) MACHINE LEARNING FOR THE CLASSIFICATION AND SEPARATION OF E-WASTE	**Ethan P. Zhou** (Bromfield School)
2:00PM	**ID-10** (VIRTUAL) Detecting Examination Events to Reduce Variability in Medical Image Acquisition Workflows in Radiology	**Ayush Karupakula** (University of Washington)
2:10PM	**ID-32** (VIRTUAL) An On-device Federated Learning System for SMS Spam Classification	**Siddharth Sriraman** (SSN College of Engineering)
2:20PM	**ID-37** (VIRTUAL) Automated Coronary Calcium Scoring using U-Net Models through Semi-supervised Learning on Non-Gated CT Scans	**Sanskriti l Singh** (BASIS Independent Silicon Valley)
2:30PM	**ID-47** (VIRTUAL) Using Convolutional Neural Networks with Transfer Learning for Action Recognition in Videos	**Jamal Bourne** (McDaniel College)
2:40PM	**ID-54** (VIRTUAL) Predicting Future Mosquito Larval Habitats Using Time Series Climate Forecasting and Deep Learning	**Christopher Sun** (Monta Vista High School); **Jay O Nimbalkar** (Green Hope High School); **Ravnoor Bedi** (Bronx High School of Science) University of Texas
2:50PM	**ID-68** (VIRTUAL) A Deep Spiking Convolutional Conversion Scheme for Robust Vertebrae Segmentation & Identification	**Elon Litman** (American Heritage School of Boca Delray)
3:00PM	**ID-80** (VIRTUAL) A Novel Approach For Generating Customizable Light Field Datasets for Machine Learning	**Julia Huang, Aloukika Patro, Vidhi Chhabra** (SHTEM Program)
3:10PM		

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1:30PM	**FIRST LEGO Leagure** **1. Blue Box #15971 - BluePoolBot (BPB)** **2. SAUCE Box #33728 - SAUCE Heat Charger**	Sasha Luchanok, Govind Valiyodiyil, Matthew Dona, Stefan Barbu, Pranav Mantena, Kiaan Mehta, Layla Conwey, Haashini Gounder, Hassiba Benzerrouk, Tarek Benzerrouk, Daniel Krajewski, Sahas Balusu, Stanley Li
1:40PM	**ID-30** **Mechanical-Based Design for Airfoil Structural Morphing**	**Amanda Butler, Amiri Hayes, Evan Schaffer, Niti Sinha** (Rutgers University)
1:50PM	**ID-59** **Using Dual-Axis Autonomous Solar Tracking to Maximize Solar Panel Power Output**	**Anshul Chandaliya, Griffin Forminard, Katherine Zhou, Brendan Glennon** (Rutgers University)
2:00PM	**ID-63** **Modeling the Effects of Engagement Methods in Online Crowd-sourcing Platforms**	**Rajoshi Basu, Yechan Lee** (Rutgers University)
2:10PM	**ID-65** **"Out of Sight, Out of Mind" Comparing Deaf and Hard of Hearing Child's Response to ASL Recommendation Systems**	**Merritt L Cahoon** (Samford University)
2:20PM	**ID-11 (VIRTUAL)** **A Novel Low-Cost Approach For Detection, Classification, and Quantification of Microplastic Pollution in Freshwater Ecosystems using IoT devices and Instance Segmentation**	**Saketh Sundar** (River Hill High School)
2:30PM	**ID-33 (VIRTUAL)** **Verifying Adversarial Robustness of 3D Object Detectors for Autonomous Vehicles**	**Rebecca Dollahite, Kevin Wang** (Worcester Polytechnic Institute)
2:40PM	**ID-36 (VIRTUAL)** **A Novel and Fast Distributed Computation Method for Fisher's Exact Test and Its Application in Gene Expression Profiling Studies**	**Isabelle Chen** (Los Altos High School)
2:50PM	**ID-38 (VIRTUAL)** **A Multimodally-Sensing Digitally-Embedded Smart Skin for Prosthetic Hands to Restore Sensory Feedback for Amputees**	**Varun M Sridhar** (Plano East Senior High School)
3:00PM	**ID-61 (VIRTUAL)** **Smart Wildlife Sentinel (SWS): Preventing Wildlife-Vehicle Collisions and Monitoring Road Ecology with Embedded IoT Systems and Machine Learning**	**Alan P Ma** (Jesuit High School)
3:10PM	**ID-77 (VIRTUAL)** **Using mechanical device in escalator systems for reduction of energy consumption**	**Aytan Sadirova** (Baku Higher Oil School)