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 - 12:30PM EST	ID-22 **Cognitive Profiling and Personalized Therapy Recommendation for Dementia through a Language Aware Multi-Model Artificially Intelligent System**	**Kosha Upadhyay** (Bellevue High School)
	ID-27 **Determining the Impact of Socioeconomic Status on Athletic Performance Using Machine Learning**	**Zachary J Hale, Ria Shah, Thea L Spellmeyer** (Rutgers University)
	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)
	ID-49 **Convolution Neural Network on BeagleBone Black Wireless for Machine Learning Applications**	**Amer Qouneh, Jeremy Bogacz** (Western New England University)
	ID-56 **An Analysis of Implementing a GAN to Generate MIDI Music**	**Niko C Kopparapu, Milo Ferrara, Sofia Arora, Thomas Earls** (Rutgers University)
	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)
	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)
	ID-76 **Symbolic Math Reasoning with Language Models**	**Vedant Gaur** (Aragon High School)
	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)
	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)
	ID-82 ***(VIRTUAL)*** **Modeling Misinformation With Q-Learning, Nim, and Multi-Agents**	Elijah Huang (University of California Irvine)

AM TRACK #1

IEEE MIT Undergraduate Research Technology Conference 2022

Technical Paper Oral Presentation Schedule

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 - 12:30PM EST	2021 ID-52 **A Novel Method for Protein-Protein Interface Analysis Using Sonification**	**Sophia E Meytin** (Dartmouth College)
	ID-6 **Quantum Algorithm for the Simulation of Squamous Cell Lung Carcinoma Tested through IBMQ**	**Akshita Tiwari** (Academy of Science)
	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)
	ID-23 **Adding Virtual Reality Annotation Software for Education-Technology**	**Ayush Agarwal** (BASIS Independent Silicon Valley)
	ID-46 **Analyzing Error Distributions of Quantum Noise on Cloud-Accessible IBM Quantum Computers**	**Alexander B Noviello, Brandon Stobie, Yamato Hara** (Drew University)
	ID-58 **On the Computability of the Ninth Dedekind Number**	**William Fang** **(Boston University)**
	ID-41 **EnsembleDroid: A Malware Detection Approach for Android System based on Ensemble Learning**	**Sharon Guan** (New York Institute of Technology)
	ID-48 **Performance Comparison of Machine Learning Methods in DDoS Attack Detection in Smart Grids**	**Edwin D Meriaux** (Umass Lowell)
	ID-51 **Image Dilution using Harris Corner Detection and Geometric Kernels**	**Aiden M James** (University of North Carolina at Charlotte)

AM TRACK #2

IEEE MIT Undergraduate Research Technology Conference 2022

Technical Paper Oral Presentation Schedule

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 - 12:30PM EST	ID-35 **A Miniaturized ISFET-Based Blood pH Sensing Device for Home Care Use**	**Evan J Buckley, Joshua Geyster** (Worcester Polytechnic Institute)
	ID-44 **Mimicry of skeletal muscle tissue with layered phantom for ultrasound imaging**	**Hayoung Cho** (Boston College)
	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)
	ID-55 **Development of Motor-assisted therapy bike for patients with Parkinson's Disease**	**Emma Lokey** (University of Rhode Island)
	ID-57 **SixthSense: A Wearable Ultrasonic System with Haptic Feedback for Visually Impaired Individuals**	**Kaitlyn R Lum, Olivia Wojnilo** (University of Rhode Island)
	ID-66 **A Multifactorial Correction Method for Tumor Mutation Burden**	**Anna M Konvicka** (The Cooper Union)
	ID-31 **Demystifying Quantum Materials with Deep Learning and Angle-Resolved Photoemission Spectroscopy**	**Eric Sun** (The Loomis Chaffee School)
	ID-52 **Effect of Layer Thickness and Orientation of 3D Printed Parts on the Mechanical Properties**	**Jonathan Slohoda, Tyler D Harwood** (Rutgers University)
	ID-53 **Antimicrobial Assessment of Cellulose-Copper-Silica Nanocomposites for Crop Disease Management**	**Marco A Rojas-Cessa** (Columbia University)
	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

IEEE MIT Undergraduate Research Technology Conference 2022

Technical Paper Oral Presentation Schedule

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 - 3:30PM EST	ID-2 **JARVITS: A Novel Deep Learning IoT Traffic Control System for Real-time Detection and Signal Optimization**	**Ryan Kim** (Choate Rosemary Hall)
	ID-25 **Automatic Control of a Soft Trunk Robot Actuated by Strings**	**Leonardo Garofalo** (University of Rhode Island)
	ID-26 **Role of SysML in Integrating an Interdisciplinary Team**	**Kleo Golemi** (Worcester Polytechnic Institute)
	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)
	ID-42 **Reasoning the Trust of Humans in Robots through Physiological Biometrics in Human-Robot Collaborative Contexts**	**Tiffany Guo** (Cornell University)
	ID-78 **UAV and UGV Autonomous Cooperation for Wildfire Hotspot Surveillance**	**Diego Pasini, Charles D Jiang** (The Pingry School)
	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)
	ID-81 **Conceptual design of an Experimental rocket with Variable Diameter stages: Effects on the Drag Coefficient**	**Johan J. Nuñez-Quispe** (Universidad Nacional de Ingeniería)
	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)
	ID-67 (IN-PERSON & VIRTUAL) **Improving the Performance of Computer Vision Algorithms for the Multi-Mode Hybrid Drone Delivery System**	**Ronald Leung, Kareena Shah, Chelsy Goodwill, Alexander Dong** (Rutgers University)
	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)

IEEE MIT Undergraduate Research Technology Conference 2022

Technical Paper Oral Presentation Schedule

Saturday, October 1, 2022
Stata Center 32-141
Machine Learning / Artificial Intelligence (AI) Track #2
Track Chair: Aisha Yousuf

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

PM TRACK #2

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

Saturday, October 1, 2022
Stata Center 32-155
Innovative Technologies Track
Track Chair: James Byleckie

EST TIME	PAPER TITLE	PRESENTERS
1:30PM - 3:30PM EST	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
	ID-30 **Mechanical-Based Design for Airfoil Structural Morphing**	**Amanda Butler, Amiri Hayes, Evan Schaffer, Niti Sinha** (Rutgers University)
	ID-39 **Using Dual-Axis Autonomous Solar Tracking to Maximize Solar Panel Power Output**	**Anshul Chandaliya, Griffin Forminard, Katherine Zhou, Brendan Glennon** (Rutgers University)
	ID-63 **Modeling the Effects of Engagement Methods in Online Crowd-sourcing Platforms**	**Rajoshi Basu, Yechan Lee** (Rutgers University)
	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)
	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)
	ID-33 (VIRTUAL) **Verifying Adversarial Robustness of 3D Object Detectors for Autonomous Vehicles**	Rebecca Dollahite, Kevin Wang (Worcester Polytechnic Institute)
	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)
	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)
	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)
	ID-77 (VIRTUAL) **Using mechanical device in escalator systems for reduction of energy consumption**	Aytan Sadirova (Baku Higher Oil School)