

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	<u>Ayush Agarwal</u> , <u>Brian Li</u> , <u>Neha L Peddinti</u> , <u>Yunbing Qian</u> , <u>Vinay G Menon</u> , <u>Devin S Torres</u> , <u>Sabar Dasgupta</u> (Rutgers University)
	ID-82 (VIRTUAL) Modeling Misinformation With Q-Learning, Nim, and Multi-Agents	<u>Ayush Agarwal</u> , <u>Brian Li</u> , <u>Neha L Peddinti</u> , <u>Yunbing Qian</u> , <u>Vinay G Menon</u> , <u>Devin S Torres</u> , <u>Sabar Dasgupta</u> (Rutgers University)

AM TRACK #1

IEEE MIT Undergraduate Research Technology Conference 2022
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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 - 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)

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Saturday, October 1, 2022
Stata Center 32-155
BioEECS and Applied Physics Track,
Circuits, Materials, and Nanotechnologies 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, Benjamin Larkin (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)

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
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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 (SHEM Program)

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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 League 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-59 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)