

2022

Undergraduate Summer Student Research Conference

Welcome to the 2022 Undergraduate Summer Student Research Conference

Over 90 undergraduate students from the Lassonde School of Engineering and beyond will present their research projects during this conference. The students have been conducting research both remotely and in the lab this summer on a wide range of projects focusing on the **United Nations Sustainability Development Goals**, including robot-based disinfection of COVID-19, development of autonomous vehicles, and technology to ensure safe drinking water.

The research projects are funded through the following programs:

- Lassonde Undergraduate Research Award (LURA)
- Natural Sciences and Engineering Research Council of Canada: Undergraduate Student Research Award (NSERC USRA)
- Mitacs Globalink
- Research at York (RAY)

For more information

For more information [visit our website](#) or email us at resday@yorku.ca



Keynote Speaker

"Owning your career journey"



Dena Ghiassi, MBA, CSM

Director, EPMO delivery

[BSc, Computer Science 05
/MBA2010]

Dena is a proud York alumni with a career spanning nearly 20 years working for various organizations. Her journey has started with management consulting and later transitioned into different industries such as retail and financial services. She has specialized her expertise around delivering technology and data to help companies run more effectively and create optimal experiences for their customers and employees. She is always on a lookout to see how she can use her education, experiences and brand for the next opportunity.

Agenda



August 16, 2022



9:00 am - 4:30 pm



2nd Student Centre, York University

9:00 AM	Opening Remarks
09:15 AM	Keynote Speaker: Dena Ghiassi
10:00 AM	Session One
11:45 AM	Session Two
1:15 PM	Lunch
2:30 PM	Session Three
3:45 PM	Afternoon Break
4:00 PM	Graduate Research Talk
4:15 pm	Closing Remarks & Awards Ceremony



2022 awards

Best Presentation Awards

- First Place
- Second Place
- Third Place
- Honorary Mention for each Session

Student Choice Awards

- First Place Students' Choice Award
- Second Place Students' Choice Award
- Third Place Students' Choice Award

Research Project Presentations

Session 1 10:00 - 11:30



UN SDG 9: "Industry, Innovation & Infrastructure": *Innovation in 3D Printing and Smart Materials*

Room A2

Steeve-Johan Otoka-Eyota, Yuyu Ren, "Defect Detection During Metal 3D printing Using Supervised Machine Learning"

Yassine Turki, "Performing Hardness Test Using Fully Automated Three-Dimensional Printer"

Madison Bardoel, "Two-Phase Loop Thermosyphon with Porous Evaporators Fabricated by Laser Powder Bed Fusion"

Jatin Chhabra, "Fracture Point Detection and Prediction in Graphene through Machine Learning Algorithms"

Josue Montero, "Characterization of Interface Materials"



UN SDG 11: *Sustainable Cities and Communities*

Room B2

David Tran, "Microsimulation Analysis of Truck Signal Priority for Long Combination Vehicles on Arterials"

Jared Yen, "Extracting Urban Roads and Lanes from Aerial Imagery with Artificial Intelligence"

Raneem Ayoub, "Dynamic Parking Pricing Using Real-Time Payment Data"

Kumar Vaibhav Jha, "Analysing Various Multi Object Trackers on Novel Dataset to Determine the Most Effective Tracker"

Nick Di Scipio, "Modifying And Optimizing The SARIT Micromobility Vehicle For Specific Use Cases On York's Campus"

Kuimou Yu, Rupayon Haldar, "Benchmarking Deployments of Computer Vision Mobility Systems for Various Applications"

3 GOOD HEALTH AND WELL-BEING



UN SDG 3: *Good Health and Well-being*

Room C2

Bilqees Yousuf, "Development of a Post-Crash Care Dashboard"

Dhyan Thakkar, "Toxicity Studies of Imipenem & Imipenem Copper Complex on Two Common Wastewater Bacterial Species"

Joaquin Ramirez-Medina, "In-vivo Microfluidic Assays to Investigate Cardiac Functional Impairments and Developmental Abnormalities Associated with SARS-COV-2 ORF3a Protein Expression in Drosophila Larval Heart"

Mohammadreza Kazemi, "Software Development for a Wearable Brain EEG Monitoring Device"

Nina Yanin, "Optimal Risk-aware Point-of-Interest (POI) Recommendations during Epidemics"

Roozbeh Alishahian, Sofia Graci, Youssef Demashkieh, "Development of Tools for Bioprinting Fidelity Assessment and 3D Printing Bioniks with Internal Structures"

7 AFFORDABLE AND CLEAN ENERGY



UN SDG 7: *Affordable and Clean Energy*

Room D2

Akshay Karthiyayini Kelappan, Niloy Sen, Sheel Bhadra, "Design and Demonstration of a Photovoltaic-thermal Solar Water Heating System"

Jack McArdle, "Spherical Re-entrant Cavities for Pool Boiling Enhancement using SLM"

Mahmoud Al Akchar, "Single-Phase Grip Metal Cold Plate Technology for IGBT Modules Cooling Applications"

Jaiden Fairclough, "Geothermal Energy Piles"

Maria Beshara, "Gallium-Nitride Based Multi-MHz Bidirectional Power Interface for Integrated Energy Storage in a DC Microgrid"

Walid Orabi, "Topology Optimization of Liquid Cooled Heatsinks"

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



UN SDG 9: "Industry, Innovation & Infrastructure": *Innovation in Space Science & Engineering*

Room E2

Akshay Karthiyayini Kelappan, Niloy Sen, Sheel Bhadra, "Design and Demonstration of a Photovoltaic-thermal Solar Water Heating System"

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Session 2 11:45 - 1:15

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



UN SDG 9: "Industry, Innovation & Infrastructure": *Innovation in 3D Printing and Smart Materials*

Room A2

Vennesa Weedmark, "Seasonal variability of the Southern Polar Layered Deposits of Mars during surface observations and numerical simulations"

Mark Vertlib, "Improving the Satellite Facet Modelling Process for More Accurate Simulated Light Curve Analysis"

Matias Quirola, "Interpreting Layers of the North Polar Ice Cap of Mars for a Climate Signal"

Aiden Weatherbee, "Robotic Capture and Collision Avoidance in Simulated Space Environment"

Yanchun Fu, "Demonstrating Feasibility of Integrated RSO Detection and Tracking Workflow With Star-Tracker Grade Sensors and Particle Swarm Optimization Simulator"

Sabrina Porrovecchio, "Identifying Subsurface Ice in Phlegra Montes, Mars, Using the Mars Reconnaissance Orbiter's Shallow Radar (SHARAD)"

6 CLEAN WATER
AND SANITATION



UN SDG 6: *Clean water and sanitation*

Room B2

Shafin Mahmud, "Visualizing Subsurface Contaminant Transport with Web-based Course Tools"

Ghuncha Fatma, "Machine Learning Guided Filter Design to Alleviate Heavy Metal Pollution"

John Li Chen Hok, "Lead in Decentralised Drinking Water Systems"

Reetika Ali, "Rapid Groundwater Potential Mapping of the Ban Saka area of Laos using GIS and RS tools and Analytic hierarchy process (AHP) techniques"

Zehra Fatima, "Modeling the Effect of Climate Change on Groundwater Recharge"

Kyle Baird, "3D Printed Proportional Water Sampling Device, to Help Detect Chemical Contaminants in Decentralized Drinking Water Systems"

13 CLIMATE ACTION



UN SDG 13: *Climate Action*

Room C2

Abdul Nasir, "Effect of Climatic Conditions on the Development of Thermal Loads on a Concrete Bridge deck"

Aditi Chowdhury, "Effect of Ionic Strength on Bisulfide Diffusion through Bentonite"

Kunwar Aneeq Khan, "Comparative Analysis of Multiple General Circulation Models (GCMs) and Observed Climatic Datasets for Different Climatic Change Scenarios"

Lawrence Prophete, "Autonomous Pilot Balloon Tracking For Boundary Layer Wind Data Collection"

Anupriya Ravula, "Analysing the role of novel bacterial isolates *M. esteraromaticum* and *B. infantis* in BTEX bioremediation under different culture conditions"

Tingtao Li, "Receiver Front-end Integration for Navigation Satellite-based Reflectometry"

11 SUSTAINABLE CITIES AND COMMUNITIES



UN SDG 11: *Sustainable Cities and Communities*

Room D2

Keandre Webb, Shehnaz Islam, "Using Drones and Object Detection to Statistically Analyze City Litter"

Gaurav Garg, "Behavior Trees for Autonomous vehicles"

Faiz Ahmed, "Software and Social Media to the Rescue: Mobile App for the Next Pandemic at York"

Fahad Younus, "Effect of Electric Vehicle Charging Loads on The Power Grid"

Tricia Martinez, "A New Model for Estimating Pedestrian Level of Service"

John Yacoub, "LiDAR Assisted Fiducial Marker-Based Navigation for Autonomous Vehicles"

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



UN SDG 9: "Industry, Innovation & Infrastructure": *Innovation in Software and AI*

Room E2

Haris Muhammad, "Software Ownership in the Healthcare Ecosystem"

Faruq Afolabi, "Exploring the Impact of Immersion on Teleoperated MASS"

Mohammed Ahmed Fulwala, "Jersey Number Recognition in Team Sports"

Dennis Johnson, "Product Families in Mobile App Platforms"

Hongru Wang, "A Feasibility Study on Deep Convolutional Neural Networks for Semantic Segmentation using 2D Bird-Eye-View (BEV) Projection Data"

Vithurshan Suthakar, "Database Architecture for SSA Ground Systems Server for Optical Data Processing"

Session 3 2:30 -3:45

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



UN SDG 9: *Industry, Innovation & Infrastructure:* *Innovation in AI*

Room A2

Chakka Vijaya, Aswartha Narayana, "An Efficient Partial Model Training Strategy for Federated Learning with Resource-Constrained Edge Devices"

Shahen Alexanian, "An Empirical Examination of Various Reinforcement Learning Algorithms in a Deterministic Environment"

Aakash Agarwal, "Caching Strategy based on Deep Reinforcement Learning for IoT networks using Transient Data"

Xuchen Tan, "Image Capturing and Processing to Improve Software Quality"

Yonis Abokar, "Template-based Database Resource Estimation of Database Workloads"

11 SUSTAINABLE CITIES
AND COMMUNITIES



UN SDG 11: *Sustainable Cities and* *Communities*

Room B2

Lamek Berhane, "Characterization of Rock Tensile Strength for Resilient Infrastructure Design"

Sayee Srikarah Volaity, Debadrita Das, "Bond Strength Recovery between Concrete and Steel Rebar Interface in the presence of Super-Absorbent Polymers"

Emma Bresil, "Steel Beam to Column Connection Resiliency in Fire"

Jowel Akkeh, Pavly Yacoub, "Development of an ArcGIS Online Visualization Tool to Analyze and Display Response Time"

Nadine Norman: "Applying 'Domain Adaptation' To Single Tree Detection Neural Network"

4 QUALITY
EDUCATION



UN SDG 4: *Quality Education*

Room C2

Audrey Garcia, "Improving UNHack Design Thinking Process"

Damith Tennakoon, Alexandro Salvatore Di Nunzio, "The Augmented and Virtual Reality Sandbox - Teaching Complex Systems through Immersive Environments"

Sahel Ghazanfari, "Creating the Global Classroom: Enhancing the Commercialization of University Research"

Suha Siddiqui, "Expertise Aware Content Customization"

Yixi Zhao, "Assessing the Systematicity of Software Engineering Reviews Self-Identifying as Systematic"

7 AFFORDABLE AND
CLEAN ENERGY



UN SDG 7: *Affordable and Clean Energy*

Room D2

Rehan Rashid, "Experimental Study and Performance Characterization of High-Performing Microchannel Heat Exchangers for Hypersonic Flow"

Bridget Price, "Fed-batch Cultivation as a Bioprocess Tool to Increase Lipid Accumulation and Carotenoid production by *Rhodospiridium toruloides*"

Himanshu Mishra, "Application of Gryffin in the design of Solar Cells"

Hira Memon, "Cost Optimization Model of Electric Vehicles Parking Lots for Distribution System Operator"

Rayyan Al-Kadri, "Development of 3D-printed wick structures"

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



UN SDG 9: *Industry, Innovation & Infrastructure: Innovation in Software and AI*

Room E2

Azalea Gui, "Large Scale Replication Study on Release Planning Methods"

Jarod Anjelo P. Lustre, "Stereoscopic Depth Constancy from a Different Direction"

Jiahao Li, Amin Mohammadi, "Audio-Video Scene Recognition"

Yunyun(Emily) Zhang, "Deep Reinforcement Learning for AoI-Aware Blockchain-enabled Wireless Networks"

Naeem Model, "Semi-Supervised Land-Water Classification of LiDAR Waveforms under the Mean Teacher Model"



Meet the Student Researchers

- Lassonde Undergraduate Research Award (LURA)
- MITACS Globalink Intern
- Natural Sciences and Engineering Research Council of Canada - Undergraduate Student Research Award (NSERC USRA)
- Research Assistants
- Research at York (RAY)
- Volunteers

For more information visit our [website](#) or contact us at resday@yorku.ca

UNDERGRADUATE
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