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# THE UNDERGRADUATE SUMMER STUDENT RESEARCH CONFERENCE AT THE BERGERON CENTRE FOR ENGINEERING EXCELLENCE

Lassonde is excited to host the second annual Undergraduate Summer Student Research Conference: "So You Think You Can Research?"

Over 50 undergraduate students from the Lassonde School of Engineering and beyond will present their research projects at this professional conference. The students have been conducting research in both science and engineering with Lassonde professors working on a wide range of projects on implantable chips for the human brain to Unmanned Arial Vehicles (UAVs).

Lassonde is happy to welcome students not only from our home Faculty but also from other disciplines at York and beyond, including international visiting students from Costa Rica, France, China and Poland. Our Lassonde Undergraduate Research Award (LURA) program is open to all undergraduate students and this year 26 LURA students will be presenting their summer research projects. In addition, the participating students include 14 NSERC Undergraduate Student Research Award (USRA) students, three Research at York (RAY) students, two Mitacs Globalink Research Internship students, one James Wu Research Internship Award student and ten students from other programs. The best presentations and posters will be selected and presented with awards at the end of the event.

The goal of this conference is to celebrate the research that has been done over the summer and to inspire the students to pursue further research careers. In addition, today's conference prepares the students for conference environments they will encounter in their future careers. To find out more about the conference and how to get involved next year, please see the website dedicated to undergraduate research: http://www.lassondeundergraduateresearch.com/

Many thanks to all the professors, graduate and undergraduate students, staff and volunteers for making our research programs a success and for contributing to the organization of the 2017 conference. We are also grateful for the support from NSERC, Mitacs and the Office of the Vice-President Research & Innovation (VPRI) at York.



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### TODAY'S SCHEDULE

TIME	ACTIVITY
7.30 am – 8.30 am	Registration, breakfast, poster set-up (doors open at 7 am)
8.30 am – 8.45 am	Welcome address (MC: Dr. Dan Palermo, Associate Professor)
	Dr. Spiros Pagiatakis, Associate Dean, Research and Graduate Studies
	Dr. Lisa Philipps, Interim Vice-President Academic & Provost
	Dr. Andrew Sinclair, Manager, NSERC Ontario Regional Office
8.45 am – 9.15 am	Keynote speaker:
	Dr. Solomon Boakye-Yiadom, Assistant Professor
9.15 am – 11.00 am	Oral Presentations
11.00 am – 11.15 am	Coffee break
11.15 am – 12.45 pm	Poster Session 1
12.45 pm – 2.00 pm	Lunch (terrace BBQ)*
2.00 pm – 3.30 pm	Poster Session 2
3.30 pm – 3.45 pm	Coffee break
3.45 pm – 4.15 pm	Lassonde Alumni talk: Patrick Lasagna, Applanix Corporation
4.15 pm – 5.00 pm	Awards presentation: Dr. Lucy Fromowitz, Vice-Provost Students

\* In case of rain, additional seating will be available on the main and lower floors

### **AVAILABLE AWARDS**

#### **ORAL PRESENTATION AWARDS**

First Place Best Talk Award

Second Place Best Talk Award

Third Place Best Talk Award

Student's Choice Best Talk Award

#### **POSTER PRESENTATION AWARDS**

First Place Best Poster Award

Second Place Best Poster Award

Third Place Best Poster Award

First Honorary Mention

Second Honorary Mention

Student's Choice Best Poster Award

#### Note to students:

Please fill in your ballots for the "Student's Choice Award" after each session in which you did NOT present.

### ORAL PRESENTATIONS

9.15 am - 11.00 am

- 1. **Asmarah Amin** Characterizing Electrotactic Behaviour In Free-Swimming Larval Zebrafish In A Microfluidic Device (Mechanical - Dr. Pouya Rezai)
- 2. **Brittney Cooper** Characterizations Of Martian Water-Ice Cloud Crystal Geometries From Phase Functions Derived Using Marci Image Data (ESSE - Dr. John Moores)
- 3. Coby Davis Localization And SLAM With A Unique Landmark (EECS Dr. Michael Jenkin)
- 4. Rahmah Khalid Use Of Data-Driven Models For Flood Prediction (Civil Dr. Usman Khan)
- 5. Shayan Monabbati Signal Processing For Optogenetics (EECS Dr. Andrew Eckford)
- 6. **Austin Martins-Robalino** Electrical Resistance Heating For Soil And Groundwater Remediation (Civil Dr. Magdalena Krol)
- 7. **Amanpreet Walia** Building The World's Largest Dynamic Scenes Videos Database (EECS Dr. Richard Wildes)

### **POSTER PRESENTATIONS, SESSION 1**

#### 11.15 am - 12.45 pm

- 1. Parisa Abdolrahim Poorheravi Microgrid Protection (EECS Dr. Ali Hooshyar)
- 2. **Ragheb Abunahla** The Modelling and Development of a Circuit-Printing Optimization Algorithm (EECS Dr. Gerd Grau)
- 3. **Daliah Adler** Domestic water use in Toronto: Learning from the Israeli and Dutch examples (Civil Dr. Usman Khan)
- 4. **Katie Allison** Development of a Hydrodynamically Focused Nozzle for Printing Electronics (EECS - Dr. Gerd Grau)
- 5. Sara Azari Usability study for TBB (ENAMEL project) (EECS Dr. Melanie Baljko)
- Parastoo Baghaei Distributed leader election algorithms for simple robots (EECS -Dr. Patrick Dymond)
- Amin Bandali The Magic of Specifications and Type Systems (EECS Dr. Jonathan Ostroff)
- 8. **Steven (Szu-Han) Chen** Volumetric Super-Resolution for Learning Detailed Protein Structure Prediction (EECS Dr. Marcus Brubaker)
- Mary Choi Seizure detection algorithm for implementation in a POCT device (EECS -Dr. Hossein Kassiri)
- 10. **Shweta Dixit** Development and Evaluation of an Interactive Tangible Device (EECS Dr. Melanie Baljko)
- 11. Rabia Ejaz Transfer Learning in Neural Networks (EECS Dr. Melanie Baljko)
- 12. **Edouard Gaschet** Analysis of the Composite Materials Behaviors for 3D Printing Before and After Aging (Mechanical - Dr. Alex Czekanski)
- 13. **Arman Golmakan** Detection and Home Monitoring of Age-Related Macular Degeneration (AMD) (EECS Dr. Ebrahim Ghafar-Zadeh)
- 14. **Sam Guraya** A 8-Channel Flexible Dry Active Electrode System for Neural Monitoring and Motion Artifact Detection (EECS Dr. Hossein Kassiri )
- 15. **Salma Ibrahim** Media Utilization and Nutrient Supplement Addition in Anaerobic Digestion (Civil Dr. Ahmed Eldyasti)
- 16. **Sherif Ibrahim** Improving Curricular Design and the Undergraduate Experience (Mechanical )
- 17. **Arslan Javed** Testing Uniformity of Equibiaxial Tension Testing with Finite Element Modelling (Mechanical - Dr. Alex Czekanski)
- 18. Kevin Joseph Content-Based Recommendation (EECS Dr. Hui Jiang)
- 19. **Tiffany Joseph** Nanosatellite Size and their Impact on Environmental Disturbance Torques (ESSE - Dr. Regina Lee)
- 20. **Sara Kapuscinska** Pulse shaper design for Kolsky bar experiments (Mechanical Dr. Alex Czekanski)
- 21. **Nicole Valkova** Water Balance at York University Potable Water Use (Civil Dr. Usman Khan)
- 22. **Josh Karon** Public Transit: Big Data Analytics and Visualization (ESSE Dr. Mojgan Jadidi)
- 23. **Hasma Habibiy** Water Conservation at York University Potable Water Use (Civil Dr. Usman Khan)

### POSTER PRESENTATIONS, SESSION 2

#### 2.15 pm - 3.30 pm

- 1. **Ramandeep Kaur** Microgrids and its applications in grid-connected and off-grid systems (EECS Dr. Hany Farag)
- 2. **Min Jae Kim and Mike Stewart** Manipulating the Camera Imaging Pipeline Using the Android Camera2 API (EECS Dr. Michael Brown)
- 3. **Sunjik Lee** Development and Evaluation of Digital Assistive Technologies To Teach Braille (EECS - Dr. Melanie Baljko)
- 4. Brandon Loy Pilot Balloon Tracking (ESSE Dr. Mark Gordon)
- 5. **Sara Malik** Estimation of the Energy Consumption of Battery-Based Electric Transit Buses (EECS Dr. Hany Farag)
- 6. **Kristen McIntosh** Fully Automated Particle Picking in Cryo-EM using Convolutional Neural Networks (EECS Dr. Marcus Brubaker)
- 7. **Samal Munidasa** Automation of an electrochemical impedance spectroscopy (EIS) platform for the characterization of N2a neuroblastoma cell growth (EECS Dr. Ebrahim Ghafar-Zadeh)
- 8. **Nana Nosirova** Multitask learning for named entity recognition (EECS Dr. Hui Jiang)
- 9. **Chukwubuikem Omeziri** High Strain-Rate Behavior of Mechanoluminescence material in PDMS (PDMS Composite) (Mechanical Dr. Alex Czekanski)
- 10. **Constantine Papakonstantinou** Understanding the drop adhesion and shedding to facilitate dropwise condensation by shearing air flow (Mechanical Dr. Alidad Amirfazli)
- 11. Runa Patel ENAMEL (EECS Dr. Melanie Baljko)
- 12. **Roberto Salazar** Use of Novel Engineered Materials in R.C. Structures (Civil Dr. Stavroula Pantazopoulou)
- 13. **Yanling Bai** Quantifying the Climate Change Effects on Groundwater Recharge (Civil Dr. Rashid Bashir)
- 14. **Alexandre Séguin** Towards a Methane Measuring Sensor for Titan Exploration (ESSE Dr. John Moores)
- 15. **Pooria Shafia** The effect of the field of view size on the performance of visuo-spatial tasks in virtual environments (EECS Dr. Robert Allison)
- 16. **Michael Soto** Repair and Retrofit through Nonlinear Modelling of a Post Tensioned Concrete Bridge Pier with FRP sheets (Civil - Dr. Dan Palermo)
- 17. Mohammad Syed Runtime for Airspace Evaluation (EECS Dr. Franck van Breugel)
- 18. **Sogand Talebi** Innovation Creativity and STEM Entrepreneur Bootcamp (Mechanical Dr. Andrew Maxwell)
- 19. **Farouk Wahsh** The Effect of High Strain Rate on the Piezo Properties of Elastomers with Carbon Nanotubes (Mechanical Dr. Alex Czekanski)
- 20. **Li Yin** Enabling Media for Literacy: Develop and Evaluate Digital Technologies (EECS Dr. Melanie Baljko)
- 21. **Bita Yousefi Pihani** Biological Denitrification System using Hydrogen Gas under Anoxic Condition (Civil Dr. Ahmed Eldyasti)
- 22. **Sejal Sahni** Measure Accessibility to Urban Infrastructure for people with physical disabilities (ESSE Dr. Mojgan Jadidi)

### MEET THE STUDENTS

#### LURA: Lassonde Undergraduate Research Award

NSERC USRA: Natural Sciences and Engineering Research Council of Canada - Undergraduate Student Research Award

**RAY:** Research at York

**50:50:** High School Researchers

#### BITA YOUSEFI PIHANI Dept. Of Civil Engineering

Bita Yousefi Pihani is a 3rd year student at the Lassonde School of Engineering, York University. Having specialized in Civil Engineering, Bita is spending the summer exploring the development of biological denitrification in waste water treatment with Dr. Ahmed Eldyasti. The research focuses on removal of ammonia by reducing nitrite to nitrogen gas. This process is done by using hydrogentrophic denitrification approach using hydrogen gas as an electron donor. By the end of the summer, Bita is hoping to have furthered the research in gaining a better picture of how the biological denitrification treatment is done. This research is important because the existence of ammonia in the environment can be very toxic to both aquatic life and human life. The novelty in this approach lies in the introduction of the hydrogentrophic denitrification which is cost effective, energy efficient, and environmentally friendly.

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#### DALIAH ADLER Dept. Of Civil Engineering

Dr. James Wu Research Internship

Daliah Adler is entering her 2nd year at the Lassonde School of Engineering. Having specialized in Civil Engineering, Daliah is spending her summer working with Dr. Usman Khan on advancing water management strategies in the Greater Toronto Area (GTA). Specifically, Daliah will be modelling Israel and the Netherlands for techniques of increasing water availability, reducing water waste, and adopting integrated water resource management. Daliah hopes to broaden her understanding of water use in varying regions, and apply these methods to reduce the water footprint in the GTA. This is important because in addition to being central to life, water has significance in environmental, economical, and political sectors. Although Canada has an abundance of water, the mismanagement of water has many ramifications, e.g. contamination and the overuse of freshwater. Therefore, it is crucial to improve our understanding of water consumption and its impact on the public.

### LURA

#### MICHAEL SOTO Dept. Of Civil Engineering

Michael Soto is in the final year of his program at the Faculty of Civil Engineering at Tecnológico de Costa Rica. He is a visiting student working to develop a methodology for repairing and retrofitting a post-tensioned bridge pier using Fiber Reinforced Polymer (FRP) sheets under the supervision of Dr. Dan Palermo.Specifically, Michael is conducting analytical simulations of an existing bridge pier in its original, current and rehabilitated states, using non-linear modeling software. By the end of the summer, Michael aims to have developed a viable repair procedure that can be implemented in Costa Rica to resolve current deficiencies in the present structure due to the transfer of axial load from the superstructure into the pier combined with the demands from seismic loads for which the structure was originally designed. The importance of the research lies in the need to incorporate new materials, such as FRP's, as a quick and simple solution for structural problems.





#### RAHMA KHALID Dept. Of Civil Engineering

LURA

Rahma Khalid is a 3rd Civil Engineering student in the Lassonde School of Engineering. Rahma will be spending her summer conducting research under the supervision of Dr. Usman Khan. Her research will investigate historical flood trends as a means to develop flood forecasting methods using big-data techniques and artificial intelligence methods. This is highly important as floods continue to be the most devastating natural disasters causing thousands of causalities and billions of dollars in losses annually. Specifically, the impact of floods is most severe on megacities due to the large population and concentration of infrastructure. Therefore, improved flood protection methods, such as flood forecasting methods, are essential for the protection of these vulnerable regions.



### ROBERTO SALAZAR

Roberto Salazar is in the 5th and final year of Studies at the Technological University of Costa Rica, and is currently a LURA student in the department of Civil Engineering, at the Lassonde School of Engineering, York University. Having specialized in Reinforced Concrete Retrofit with FRP Materials, Roberto is currently participating in research into Ultra-High Performance Concrete (UHPC) with strain-hardening properties as a member of Dr. Pantazopoulou's team. Roberto is conducting several experiments for different concrete mixes using synthetic (PVA) Fibers and more than 50% replacement of cement with Fly Ash (an industrial waste), and various other admixtures, in order to obtain specific properties for the self-consolidated concrete product. Roberto hopes to have concluded the optimal mix design that will produce ideal characteristics in terms of flowability (self-consolidation), sustainability, and mechanical behavior.

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SALMA IBRAHIM Dept. Of Civil Engineering

Salma Ibrahim is a 4th year civil engineering student at the Lassonde School of Engineering. This summer Salma will be doing research under the supervision of Dr. Ahmed Eldyasti in the specialization of sanitary and environmental engineering. In particular, Salma will be exploring the effects of media utilization and nutrient supplement additives to enhance anaerobic digestion using continuous systems. Anaerobic digestion is a biological conversion process that transforms organic matters into biogas in the absence of oxygen. The improvement of anaerobic digestion efficiency is important for industrial and domestic purposes for fuel production and waste management. By the end of the summer, Salma is hoping to have furthered research in improving solid management within the wastewater treatment process.





#### YANLING BAI Dept. Of Civil Engineering

Mitacs Globalink

Yanling Bai is a 3rd year student who is interning at the Lassonde School of Engineering. Having specialized in Civil Engineering, Yanling is spending the summer exploring modeling the effect of climate change on groundwater recharge with the instruction of Dr. Rashid Bashir. Specially, Yanling will be conducting unsaturated groundwater flow modeling with the effect of climate using Hydrus 1D. By the end of the summer, Yanling is hoping to have furthered the research to gain a better picture of how the effect of climate change can be taken in to account with in the context of groundwater modeling and setting up a soil-atmosphere model and predicting groundwater recharge for historical and future climates.

#### AUSTIN MARTINS-ROBALINO Dept. Of Civil Engineering

Austin Martins-Robalino is a 2nd year student at the Lassonde School of Engineering. Having specialized in Civil Engineering, Austin is spending the summer exploring electrical resistance heating remediation in Dr. Krol's laboratory. Specifically, Austin will be conducting low temperature electrical resistance heating (ERH) simulations using MATLAB. By the end of the summer, Austin is hoping to have furthered the research and gain a better picture of how contaminants are transported in different soil compositions with various parameters such as layer thicknesses, distance from electrodes, and maximum temperature. This will lead to a better understanding of contaminant transport during ERH remediation, resulting in a more efficient and effective ERH technology.

LURA





#### BRANDON LOY Dept. Of Earth & Space Science & Engineering

NSERC USRA

Brandon Loy is going into his of 3rd year Electrical Engineering at the Lassonde. Brandon is hoping to gain practical experience in the world of signal processing to help him as he progresses in his career. Brandon is working in the Air Quality Research Laboratory, under the supervision of Professor Mark Gordon, to develop a low cost method of tracking pilot balloons (pibals). The system will consist of a microcontroller, an inertial measurement unit, a video camera, and software to track the balloon and calculate wind speed and direction in the lower atmosphere. Brandon will put this system to the test by conducting real pilot balloon launches. These measurements are important for air quality applications such as determining pollutant emissions and modelling the transport of pollutants.



#### BRITTNEY COOPER

Dept. Of Earth & Space Science & Engineering

Brittney Cooper is entering her 5th year at York double majoring in Atmospheric Science and Astronomy at Lassonde, and has been an undergraduate research assistant in Dr. Moores' lab for three years specializing on projects rooted in planetary atmospheres. She is also a new member of the Science Operations team on Mars Science Laboratory (Curiosity Rover), and is a licensed private pilot and glider pilot.

LURA

Her current work focuses on determining the scattering phase function of Martian water ice clouds, as well as constraining the geometries of the ice crystals which make up these clouds. This is important because it helps scientists and Martian climate modellers better understand the contribution of these clouds to Mars' climate and radiation budget. It can tell us more specifically how these clouds scatter incident solar radiation and whether glories or halos can be observed on Mars.

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#### JOSH KARON

Dept. Of Earth & Space Science & Engineering

Josh Karon is a 3rd year student of Geomatics at the Lassonde School of Engineering. Josh is spending the summer working on data analysis and visualization Transit data with Professor Mojgan Jadidi. Specifically, they are working on analyzing data provided by GO Transit, with the goal of better understanding what information can be extracted from transit data in general. By understanding data, transit providers and planner can learn from the past in order to better optimize service in the future. You can rest assured that someone is trying to get you home faster.





#### KRYSTEL REYES

#### Dept. Of Earth & Space Science & Engineering

Krystel Reyes is an incoming 3rd year student in Geomatics Engineering at the Lassonde School of Engineering in York University. Under the supervision of Dr. Gunho Sohn, Krystel is spending the summer exploring road mark recognition with Dr. Jaewook (Bruce) Jung in the GeoICT lab. Specifically, she is processing LiDAR data to be used in the Deep learning algorithm. Moreover, she is classifying points to train and test neural networks in road mark recognition. By the end of the summer, Krystel is hoping to have a further understanding of the deep learning techniques used, and the processing and other applications of data from LiDAR scanners. This is important because it will lead to further developments in transportation. This will help autonomous vehicles navigate roads better and could be added to vehicles as another safety measure. The techniques used may also be applied to further research in object classification and detection.

**TIFFANY JOSEPH** Dept. Of Earth & Space Science & Engineering

Tiffany Joseph is a 3rd year Space Engineering student working with Professor Regina Lee at the York University Nanosatellite Laboratory. Her summer project is concerned with guidance and navigation for nanosatellites, particularly the impact and effect of environmental disturbance torques on such small satellites. Her project will use a simulated CubeSat<sup>™</sup> with 3-axis reaction wheel control to demonstrate that smaller satellites are more affected by environmental disturbances, and thus require larger reaction wheels. This relationship will be explored by manipulating the satellite parameters (volume, mass, and reaction wheel size), and examining the time it takes for the satellite to detumble, as well as the overall pointing stability. Tiffany will be running simulations in MATLAB and conducting a literature review to interpret her findings, and by the end of the summer, she hopes to provide a more definitive relationship between disturbance torques and satellite size for nanosatellites.

LURA





#### ALEXANDRE SÉGUIN Dept. Of Earth & Space Science & Engineering

NSERC USRA

Alexandre Séguin is a 3rd year undergraduate student, completing a Bachelors of Engineering with a speciality in Space Engineering. This summer, Alexandre is investigating how the speed of sound can be exploited to determine the mixing ratio of methane and other trace gases in Titan's lower atmosphere. Under the supervision of Dr. John Moores, this student has written a theoretical computational model of humidity's effects on sound velocity and, using water on Earth as an analogue, is now collecting field data to support the theory. As it pertains to measuring methane levels, Alexandre hopes to show that speed of sound sensing is an affordable and lightweight alternative to the conventional method, mass spectroscopy. In the context of Titan exploration missions, this could mean the accommodation of more science apparatus on spacecraft platforms and a decrease in the financial impact of payloads.



#### AMIN BANDALI

#### Dept. Of Electrical Engineering & Computer Science

Amin Bandali is a 4th year Computer Science student at the Lassonde School of Engineering, York University. Amin's research interests are programming languages and formal methods. Specifically, functional programming languages, type systems, proof systems, and automated provers. Amin spent the last summer in the Software Engineering Lab under supervision of Professor Jonathan Ostroff and Simon Hudon, working on various parts of the Literate Unit-B theorem prover and creating Unit-B Web. Unit-B is a new formal framework for specifying and modeling systems that must satisfy both safety and liveness properties. Literate Unit-B is the tooling that supports the Unit-B Logic and Unit-B's computation models. Unit-B Web is a web interface for doing predicate calculus proofs, bringing the Literate Unit-B prover to the web.

Dept. Of Electrical Engineering & Computer Science

ARMAN GOLMAKAN

Arman is a 3rd year student at department of Electrical Engineering and Computer Science. Arman is spending the summer exploring Age Related Macular Degeneration in Dr. Ghafar-Zadeh's laboratory. Arman will be developing applications which assist patients diagnosed with AMD. By the end of summer, Arman is hoping to create many different test applications and have them implemented on different platforms. This is important because there are currently few reliable methods to diagnose this medical condition and a new development can be a massive breakthrough in medical technology.





### KATIE ALLISONLURADept. Of Electrical Engineering & Computer Science

Katie Allison is going into her 2nd year of Engineering Science at the University of Toronto. Over the course of the summer, Katie will be working in Dr. Gred Grau laboratory using a 3D printer and various testing equipment. Her work involves the modelling, fabrication, and testing of small-scale channels with hydrodynamic focusing. By the end of the summer, Katie is hoping to have developed a novel hydrodynamically focused nozzle for printing large-area electronics like wearable electronics and displays. This will require her to design a focusing system optimized for reliability and miniaturization of the ink flow through iterative fabrication and testing. The goal of this project is to maintain small feature size and reliable results while allowing high speed additive printing with a low cost and easily fabricated nozzle. Doing so would make the printing of large-area electronics much faster and less expensive.

#### LURA KRISTEN MCINTOSH Dept. Of Electrical Engineering & Computer Science

Kristen McIntosh is a 4th year student at The Lassoed School of Engineering. After having studied Machine Learning in her courses, Kristen is spending the summer exploring the implementation of deep convolutional neural networks in Dr. Marcus Brubaker's laboratory. Specifically, Kristen will be developing a deep convolutional neural network to perform the task of identifying particles in electro-cryo microscopy micrographs. This is important because particle picking is a very time consuming task for structural biologists. By automating this task accurately and efficiently with deep learning methods, this will enable biologists to spend more time on the really important aspects of their research.





#### LI YIN NSERC USRA Dept. Of Electrical Engineering & Computer Science

Li Yin is a recent graduate of the BSc. Honours Program from the Lassonde School of Engineering majoring in Computer Science. Li previously completed EECS 4082 under the supervision of Dr. Melanie Baljko, which was a 6-credit course focusing on the Talkbox Digital Assistive Technology. Li has spent the summer working for Dr. Baljko on the Enabling Media for Literacy research project. In particular, Li was part of a group of individuals responsible for developing a Braille enabled device capable of telling a preloaded story. By the end of the summer, Li hopes to understand the architecture behind the process of designing for the visually impaired. As a computer scientist specializing in interactive systems, Li understands the importance of "barrier-free" design the need to include everyone in the design process. He hopes to apply the knowledge and experience gained from this project towards future design projects involving technology and people with disabilities.



#### Dept. Of Electrical Engineering & Computer Science

Mary Choi is a 1st year student, completing her Computer Engineering degree at the Lassonde School of Engineering. She is spending the summer exploring seizure detection algorithms and EEG signal processing in Dr. Hossein Kassiri's laboratory. Utilizing prerecorded data from seizures from an MIT database, Mary is testing and formulating an algorithm that may be implemented into the hardware of wearable, POCT devices for the purpose of detecting seizures in post head trauma patients. By the end of the summer, Mary is hoping to gain a fundamental and working knowledge of signal processing and manipulation as well as algorithm creation and testing. Having already completed a degree in Physiology and Biology at the University of Toronto as well as working in a clinical setting, it is important to Mary to be able to further her goals of helping those in need by developing devices that can be used by clinicians to provide better quality of care to patients.

LURA

#### **MIKE STEWART**

Dept. Of Electrical Engineering & Computer Science

Mike Stewart is a 2nd year student at Lassonde School of Engineering. Having specialized in Photography and Space Engineering, Mike is spending the summer exploring Android's Camera2API system in Dr. Brown's laboratory. Specifically, Mike will be creating mobile applications using Android Studios along with the Camera2API system. By the end of the summer, Mike is hoping to have furthered the research to gain a better picture of how The Digital Image Pipeline works. This is important because Android's Camera2API system opens up the Digital Image Pipeline and allows users around the world to easily utilize Optical Sensors as Experimental Instruments .

LURA





#### COBY DAVIS Dept. Of Electrical Engineering & Computer Science

Coby has just completed his 2nd year at Queen's University and is spending the summer conducting research. Coby is majoring in Applied Mathematics and Computer Engineering. Coby will be working in the Vision, Graphics, and Robotics Lab under the supervision of Dr. Michael Jenkin. More specifically, Coby will be utilizing existing robots in the lab to implement a Simultaneous Localization and Mapping (SLAM) algorithm in conjunction with a known directional landmark used for localization. He will be developing an appropriate probabilistic model for the inclusion of "almost certain" localization information within the SLAM framework. He will simulate this system to test his model. This is important because under non-ideal conditions, such systems are prone to failure. Thus, using a single landmark, the SLAM problem can be solved deterministically better than existing SLAM and localization solutions.

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**NSERC USRA KEVIN JOSEPH** Dept. Of Electrical Engineering & Computer Science

Kevin Joseph is a 3rd year student in the Faculty of Science at York University. Having specialized in Statistics and Computer Science, Kevin is spending the summer exploring Content Based News Recommendation in Dr. Jiangs' laboratory. Specifically, Kevin will be conducting experiments using Python and MySQL. By the end of the summer, Kevin is hoping to have furthered the research to gain a better picture of using knowledge graphs to recommend content. This is important because knowledge graphs provide necessary background information to computers to aid in their decision making process.





#### MIN JAE KIM Dept. Of Electrical Engineering & Computer Science

Min Jae Kim is a 3rd year student at the department of Electrical Engineering and Computer Science. Having specialized in Computer Engineering, Min Jae is spending the summer developing a Mobile Camera Pipeline manipulation app in Dr. Michael S. Brown's laboratory. Specifically, Min Jae will be developing an Android camera application using the Google's Camera2 API. By the end of the summer, Min Jae is hoping to have furthered the research to gain a better picture of the capabilities of the Camera2 API and its ability to manipulate the pipeline process of the camera. This is important because it will allow better color calibration of a mobile camera and can be used as a tool for technological advancements such as computer vision for machine learning.

LURA



#### MOHAMMAD HASAN SYED Dept. Of Electrical Engineering & Computer Science

Mohammad Hasan Syed is a 2nd year Electrical Engineering student at Lassonde School of Engineering. He is spending his summer learning about Runtime for Airspace Evaluation (RACE) under the supervision of Prof. Franck van Breugel. Part of his duty is to setup an antenna, configure RACE so that it can interface with the antenna. Then, filter the data obtained and incorporate it into RACE. He hopes to incorporate data from other sources into RACE as well. Since RACE is an open source software, Mohammad aims to contribute to this GitHub project, either by providing a more efficient way of incorporating live data feeds (servers, sensors, aircraft etc.) or perhaps, by introducing a new functionally to RACE.

LURA

#### MORTEZA GHAFAR-ZADEH Dept. Of Electrical Engineering & Computer Science

Morteza G. Zadeh is a 1st year student in the Faculty of Science. Having specialized in Biology, Morteza is spending the summer exploring the cell culture in miniaturized devices in Dr. Ghafar-Zadeh's laboratory. Specifically, Morteza will be conducting micro-fluidic design and implementation. By the end of the summer, Morteza is hoping to have hands on experiences in both biology and engineering aspects of his research. This is important because Morteza would like to be a bioengineer.





#### NANA NOSIROVA

#### Dept. Of Electrical Engineering & Computer Science

Nana Nosirova is a 3rd year Computer Science student at the University of Toronto. Whilst specializing in Computer Vision along with a minor in Statistics, she is now spending the summer of 2017 working with Prof. Hui Jiang and Mingbin Xu on a novel FOFE-based approach to solving named entity recognition (NER) and mention detection; an approach that has been recognized by ACL 2017 as one of the most outstanding papers on the subject of natural language processing (NLP). During this period, she has performed multitask learning on various linguistic datasets for the aforementioned tasks using feedforward neural networks. By the end of the summer, she is aiming to make a significant contribution to the field of NLP while also getting acquainted with the various steps and techniques involved in modern day research. The task of NER is one of the most crucial tasks in NLP, since it is a core component of almost any other NLP task such as language understanding and information

NSERC USRA

extraction.

### USRA PARASTOO BAGHAE

Parastoo Baghaei is a 5th year student at the Lassonde School of Engineering, EECS department and will graduate next year with a Computer Engineering Degree. Parastoo is spending the summer working on Distributed Leader Election Algorithm for Simple Robots in VGR Lab, under the supervision of Professor Jenkin and Professor Dymond. Specifically, Parastoo will upgrade the algorithm for parallel communications. She will also work on simulating the results and finding the mathematical model for the relation between the number of robots and the election completion period. Parastoo's research plan for this summer includes proving the correctness of the predictions for a period T (by which election is over with high probability), large-scale simulations of the algorithm and studies of bottleneck performance. She also hopes to have a demonstration of the algorithm implemented on 100 Android devices which communicate via WiFi or Bluetooth.





### PARISA ABDOLRAHIM POORHERAVI Dept. Of Electrical Engineering & Computer Science LURA

Parisa Abdolrahim Poorheravi is a 4th year Electrical Engineering student. She is interest in power electronics and has a passion for the global environment. Parisa is spending the summer of 2017 working on the "Effects of Renewable Energy Sources on Microgrid protection" under the supervision of Dr. Ali Hooshyar in the Smart Grid lab. Her job is to model renewable energy sources and simulate short circuit behavior of wind and solar photovoltaic sources. She is hoping to foster the necessary skills for bridging the gap between the theories that she has studied at the university and the practical requirements of an industrial grade project. She is impressed by the amount of work and attention that is put into the details of such complex and very important projects. Parisa also is hoping to pursue this subject after the summer to explore other relevant research works that can benefit the industry and environment.



#### POORIA SHAFIA

Dept. Of Electrical Engineering & Computer Science

Pooria Shafia is a 3rd year Biomedical and Electrical Engineering student at Faculty of Engineering and Design at Carleton University. Previously in 2015, Pooria received his Honours BSc in Psychology from York University. He is spending the summer in the Perception Lab under the supervision of Dr. Robert Allison creating virtual environments to study the human-computer interaction in such environments. Specifically, Pooria will be designing virtual worlds and experiments aimed at understanding the perceptual mechanisms and their role in how humans interact in virtual environments. By the end of the summer, Pooria is hoping to have gained a better understanding of perceptual mechanisms in virtual environments. This is particularly important because as the Virtual Reality (VR) technology grows, it is imperative to understand the perceptual mechanisms that permit or limit the use of the VR devices. This, in turn, allows for further improvement of such technologies.

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#### **RABIA EJAZ**

Dept. Of Electrical Engineering & Computer Science

Rabia Ejaz is a 2nd year student at Lassonde School of Engineering. Having specialized in Software Engineering, Rabia is spending the summer exploring deep learning and Convolutional Neural Networks (CNN) in Dr. Vassilios Tzerpos's laboratory. Specifically, Rabia will be conducting experiments for music classification using CNN, and transfer learning. She is responsible to write shell scripts to normalize and trim audio tracks, find their RMS loudness and create spectrograms. By the end of the summer, Rabia is hoping to have a better picture of Al, neural networks and transfer learning. This is important because neural networks can be used to extract patterns that are too complex to be noticed by either human or other computer techniques. Also, transfer learning (recusing the knowledge inherent in a trained neural network for a related machine learning task) can provide significant improvements in terms of the time required to complete the task.





### RAGHEB ABU NAHLA

Dept. Of Electrical Engineering & Computer Science

Ragheb Abu Nahla, also known as Rae, has just completed his 2nd year of Computer Science at the Lassonde School of Engineering. During that time, Rae has been introduced to the study of data structures and algorithm runtime optimization and so is using this knowledge during his summer working with Dr. Gerd Grau. Dr. Grau's work revolves around the world of 3D printing and the printed microelectronics. The microfabrication of electronics today, although efficient, is quite costly and requires multiple steps and thus Dr. Grau plans to print this microelectronics in a more efficient manner. However, due to the fluid mechanics, viscosity, surface tension and drying effects of the ink, this causes it to behave and have tendencies that are undesirable. Rae's task is to write an optimization algorithm that will take into account all of these factors, take any arbitrary circuit design and instruct the printer with the best mechanism to print the circuit without harming the runtime.

LURA

#### RAJVIR SINGH Dept. Of Electrical Engineering & Computer Science

Rajvir Singh is a 4th year Biology student. Rajvir will engage in research under the supervision of Dr. Ghafar-Zadeh, where she will employ biological sensors to examine the physiological changes induced in cell cultures when external conditions are varied. Therefore, Rajvir will focus on conducting an in vitro analysis in order to investigate the effects of chemical compounds on bacterial cells growth.





#### RAMANDEEP KAUR NSERC USRA Dept. Of Electrical Engineering & Computer Science

Ramandeep Kaur is an Electrical Engineering student at the Lassonde School of Engineering, now entering her 4th year. Having specialized in power and energy systems, Ramandeep is spending the summer exploring the management of Volt/Var using Distributed generation and Peer-to-Peer Communication under the supervision of Dr. Hany Farag. Specifically, Ramandeep will be conducting simulations for the site power grid of the remote communities using PSS/E software. By the end of the summer, Ramandeep is hoping to have gained a better understanding of implementation of renewable energy resources in the islanded communities in order to meet their energy requirements. This is important because she plans to pursue her professional career in research and development in the power industry. By completing this research project, Ramandeep will obtain valuable hands-on experience that will be helpful in her future endeavors.



#### **ROBERTO SANZ CAMACHO** Mitacs Globalink Dept. Of Electrical Engineering & Computer Science

Roberto Sanz Camacho, has just completed his 3rd year of Mechanical Engineering at Universidad de las Américas Puebla in Mexico. He is very interested in additive manufacturing and he is spending the summer studying the process of inkjet printing of conductive patterns on 3D printed materials in Professor Gerd Grau's laboratory. Specifically, Roberto is conducting a series of experiments in which he is trying to integrate printed electronics with 3D printed structures. By the end of the summer, Roberto is hoping to have created a functional strain gauge attached to a 3D printed model. This is important because as additive manufacturing gains ground not only in the area of rapid prototyping but also in the production of customized devices, the direct fabrication of discrete electronic components attached to 3D printed elements would continue to boost technological development in areas such as bioengineering, electronics, mechanical and structural engineering.

#### RUNA PATEL

Dept. Of Electrical Engineering & Computer Science

Runa Patel is a 3rd year psychology student from the faculty of health at the York University. Runa Patel is spending summer working on the Enabling Media for Literacy" (ENAMEL) research project in Dr. Melanie Baljko's laboratory. The main focus of her project is to encourage learning Braille among particularly children with visual disability by developing and evaluating low-cost digital technologies including 3D printing, Raspberry Pi, Arduino as well as open source software. This summer she will be contributing through user-centered design approach of pilot testing and data collection of a device. This will improve accessibility of a device so that it can be widely used among the screen reader users to improve their quality of life for person with disability. In addition, she will be developing story narratives which include the occurrence of alphabetic characters. It is important to Runa Patel as it will promote importance of braille literacy in her community.





#### SAM GURAYA

#### Dept. Of Electrical Engineering & Computer Science

Sam Guraya is an upcoming 3rd year electrical engineering student. Potentially streaming into electronics engineering, Sam spent his summer working under Dr. Hossein Kassiri exploring the field of medical devices used for biopotential recordings. Specifically, Sam is working on a dry active electrode design for EEG recordings that also detects the occurrence of motion artifacts. Sam will be aiding in the design of the active electrode, running circuit simulations and fabricating the design onto a PCB which will be integrated into a wearable EEG recording device. Testing will then be done on this device to see its accuracy of real recordings. This summer, Sam is hoping to show that with careful consideration, dry electrode recordings are just as efficient as other accepted standards. The integration of dry EEG wearable recording devices is important as its fast setup can decrease wait times in hospitals and improve areas of telehealth and personalized healthcare.

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#### SAMAL MUNIDASA

Dept. Of Electrical Engineering & Computer Science

Samal Munidasa is a 4th year biophysics student at the Faculty of Science. Having specialized in bioengineering, Samal is spending the summer exploring the use of electrical impedance spectroscopy (EIS) to characterize cell tissue with Professor Ebrahim Ghafar-Zadeh. Specifically, Samal will be automating a biocompatible microelectrode EIS platform to be used as a non-invasive alternative to current bioelectric recording devices. This platform will offer multiple channels for high throughput screening as well as a user-friendly interface. By the end of the summer, Samal is hoping to have completed a prototype for the device and a thorough analysis of the impedance spectra for neuronal cell tissues. This system is important because it can be applied to various medical applications such as tissue engineering, drug screening, and monitoring biomass. Due to its low-cost and flexibility it can be made available to everyone in either a clinical or research setting.





#### SARA MALIK Dept. Of Electrical Engineering & Computer Science

Sara is an Electrical Engineering student entering her 4th year at Lassonde. She is working under the supervision of Dr. Hany Farag. Sara's project is to develop new modelling exercises for battery electric transit bus (e-bus) to investigate its operation feasibility and integration with utility grids in a small fleet size. Specifically, she will be conducting simulations using PSCAD, an advanced power electronic simulation software, to design the required infrastructure of the charging station to power the e-buses, which will be integrated with the grid station. By the end of summer, Sara is hoping to have a better understanding of the dc fast chargers, and their power electronics, and by completing this research project she will obtain valuable experience that will help in her future studies.

LURA

#### SARA AZARI



#### Dept. Of Electrical Engineering & Computer Science

Sara Azari is a 4th year computer science student at Lassonde School of Engineering. Holding a special interest in HCI and UI development, Sara is Completing her EECS4080 Project on exploring Interactive Systems at Dr. Melanie Baljko's laboratory, working on the ENAMEL (ENAbling MEdia for Literacy) project. She worked at the lab as a RA during the Winter 2017 semester doing a literature review on previous achievements related to the subject. Considering the special needs of children with Visual Impairments in the home/family setting, Sara will be conducting usability studies using the help from recruited participants. By the end of the summer, Sara will have furthered the research by using the results from the usability study to improve the User Experience. This is important because considering the lack of such technology in the market, the ENAMEL team aims that the product is used by VI children who want to learn Braille with various individual needs and preferences.

SHAYAN MONABBATI

Dept. Of Electrical Engineering & Computer Science

Shayan Monabbati is a 4th year student in the Department of Mechanical Engineering. Shayan is spending the summer deriving mathematical models for different mammalian neuronal firing rates in Dr. Andrew Eckford's laboratory. Specifically, Shayan will be conducting Monte Carlo simulations for matching generated binary random sequences with target sequences (generated by the spike train models) using MATLAB and Python. By the end of the summer, Shayan is hoping to have furthered the research in Optogenetics, a new class of technology recently discovered to better understand neural coding and signaling. Achieving fine control in both high-temporal resolution and cellular precision has massive implications for neurological analysis, biomedical engineering, and the development of Artificial Neural Networks (ANNs).

LURA





### SHWETA DIXIT

#### Dept. Of Electrical Engineering & Computer Science

Shweta Dixit is a 4th year Space Engineering student at the Lassonde School of Engineering. Shweta is working as a Research Assistant for Dr. Melanie Baljko's research laboratory. Specifically, Shweta is responsible for the Prototype development of Interactive tangible devices using open source 3D modelling software, OpenSCAD. Currently, she is designing and implementing the hardware component of the Enabling Media for Literacy (ENAMEL) project. The team for the ENAMEL project is developing a Braille learning device to teach Braille to young children. Under this project, Shweta hopes to create a hardware model for the assistive technology that is robust and easy to use for young children. This will also help her gain valuable experience of real-world 3D modelling application that she hopes to use in the future in her career as a Space Engineer.

RAY

#### LURA STEVEN (SZU-HAN) CHEN Dept. Of Electrical Engineering & Computer Science

Steven Chen is a 4th year student in cognitive and computer science. Having formal training in machines learning, Steven is spending the summer apply deep learning on protein images taken from cryo-electron microscopy with Dr. Marcus Brubaker. Specifically, Steven will be building deep convolutional neural networks to apply image super resolution on protein structures. By the end of the summer, Steven is hoping to have furthered the research to gain a better picture of computer vision and deep learning. The project is important because being able to transform low resolution protein structures to high resolution ones can provide greater understanding of structural biology and improve drug discovery.





#### Dept. Of Electrical Engineering & Computer Science

Sunjik Lee is a 3rd year computer science student at the Lassonde School of Engineering. Sunjik is spending the summer exploring the development process of assistive technology in Dr. Melanie Baljko's laboratory. Specifically, Sunjik has been designing and implementing the software component of a Braille learning device designed to teach Braille to young children. By the end of the summer, Sunjik is hoping to build upon his knowledge and skills in psychology, software development and UI design though real-world application, as well as develop the software for the Braille learning device. This is important because it will contribute to the work of creating an assistive technology that is currently not being satisfied in the marketplace. In addition, it is important to Sunjik because he will obtain valuable experience in a software development career he wishes to pursue in the future.

LURA



#### YUCHEN KANG

#### Dept. Of Electrical Engineering & Computer Science

Yuchen Kang is a 4th year student at the Lassonde School of Engineering. Having specialized in data mining, Yuchen is spending the summer exploring cost-effective decision trees in Dr. Aijun An's laboratory. By the end of the summer, Yuchen is hoping to have furthered the research to gain a better picture of cost-effective health behaviour recommendation using decision trees. This is important because it can get effective and easy taken recommendations to help people and make people have happier life.

LURA

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#### AMANPREET WALIA

Dept. Of Electrical Engineering & Computer Science

Amanpreet S. Walia is a 4th-year Computer Engineering student at Lassonde School of Engineering, York University. Being motivated to do research in Computer Vision, Amanpreet is spending the summer exploring the design and building of video database for dynamic textures in Dr. Richard Wildes' laboratory. This project involves development and testing of computer vision algorithms for dynamic scene recognition. Specifically, Amanpreet is responsible for formulation of texture categories, design and implementation of tools for collecting videos and annotate them to be utilized by the research community for various tasks. Collected video are annotated for textures to provide accurate ground truths. This project will greatly enhance understanding about construction of databases used in computer vision, where evaluation with respect to significant databases has become a standard methodology.





#### ASMARAH AMIN Dept. Of Mechanical Engineering

NSERC USRA

Asmarah Amin is a 3rd year student at the Faculty of Science. Having specialized in Biomedical Science, Asmarah is spending the summer exploring larval zebrafish behavior through the use of microfluidics in Dr. Pouya Rezai's laboratory. Specifically, Asmarah will be conducting behavioral assays through observing and quantifying electrotaxis responses in zebrafish. By the end of the summer, Asmarah is hoping to have furthered the research to gain a better understanding of how different lines of larval zebrafish (e.g. wild-type lines and knockout lines that have had specific genes made inoperative) respond to electricity. This is important because the zebrafish is a significant model organism that has widespread applications in disease-modelling as well as pharmaceutical drug discovery and testing. Understanding behavioral differences in various knockout lines is also meaningful since this knowledge can be applied to enhance its use as a model organism.

NSERC USRA

#### WUBUIKEM OMEZIRI Dept. Of Mechanical Engineering

Chukwubuikem Johnson, Omeziri is a 4th year student in the department of Mechanical Engineering. He was initially a 2nd year medical student at Lugansk state medical university Ukraine. He relocated to Canada to pursue a degree in engineering and is dedicating his time to the creation of optical sensors for dynamic testing of flexible materials. Chukwubuikem is spending the summer in Dr. Czekanski lab to devise an optical sensor for high strain rate applications. Chukwubuikem will be working with mechanoluminescent material a type of material that emits light when mechanical actuated. Chukwubuikem is involved in the development of the composite material needed for testing. He is also involved in the development of experimental set-up needed for direct image correlation (DIC) of the optical sensor. This research could greatly reduce the cost of dynamic testing as it is a non-contact method of stress and strain measurement.





### CONSTANTINE PAPAKONSTANTINOU Dept. Of Mechanical Engineering LURA

Constantine is a 4th year space engineering student. He will conduct research at the Surface Engineering and Instrumentation Laboratory. Constantine's research project aims to facilitate the dropwise condensation process by using shearing air flow. In practice, it involves the study of condensation on different surfaces in a closed loop wind tunnel. By the end of the summer he hopes to have developed the experimental work to be able to predict how the additional forces during condensation affect the adhesion of droplets. This work is important due to the gravity dependence for some droplet removal techniques. This is an opportunity to design efficient droplet shedding processes for microgravity environments. Dropwise condensation is important for water harvesting systems, heat pipes, fuel cells, and HVAC systems. Heat transfer through dropwise condensation is the preferred mode because its heat transfer coefficient is an order of magnitude higher than that of filmwise condensation.



#### EDOUARD GASCHET

#### Dept. Of Mechanical Engineering

Edouard Gaschet is an Industrialization engineering student at the EI.CESI School of Engineering at Saint-Nazaire, in France, now entering his 4th year. He is spending this summer working as a research trainee supervised by Dr. Alex Czekanski in his IDEA-LAB. Edouard is currently working on a research topic in which he is manufacturing and testing the mechanical properties of elastomers with carbon fiber manufactured by fused deposition modelling technique in 3D printing. He is responsible for designing and testing ABS, PLA and TPU materials with 20% of carbon fiber. He is also responsible of different tests: compression (on MTS), immersion, air oven, tribology and hardness. This research is important because it gives the opportunity to discover the field of the research and will offer the related skills.

LURA

#### FAROUK WAHSH Dept. Of Mechanical Engineering

Farouk Wahsh is a 4th year undergraduate student in the Department of Mechanical Engineering. Wahsh is currently working in Professor Alex Czekanski's IDEA-LAB conducting research on the dynamic properties of elastomeric composites. More specifically, Wahsh is studying the Effect of High Strain Rate on the Piezo-Resistive Properties of PDMS with Carbon Nanotubes. The samples are prepared using a special press casting mold that Wahsh developed and the high strain-rate testing is done on the Kolsky Bar. The results of this research will help further the advances in the field of force sensing. The technology will be used for developing inexpensive highly-sensitive impact force sensors with faster response rates. It is also suitable for live feedback applications such as the development of smart vehicle dampers. The smart composite Wahsh is developing will have tremendous impact on the rubber industry, which will in turn resonate into secondary sector industries.





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#### Dept. Of Mechanical Engineering

Maira Zafar is going into her 3rd year of Mechanical Engineering at the Lassonde School of Engineering. Maira is spending her summer exploring airfoil insect contamination on aircraft in Dr. Amirfazli's Surface Engineering and Instrumentation Lab (SEiL). The insects' ruptured exoskeleton and hemolymph adhere to the airfoil surface, which increases drag, which in turn increases fuel consumption. Specifically, Maira will be preparing a biomimic pseudo-insect consisting of a hydrogel core and a thermoplastic particle shell to test this phenomenon with. By the end of the summer, Maira is hoping to have furthered the research to create a standard for comparing the impacts of different insects. This is important to the aeronautics field as it greatly reduces drag and therefore fuel consumption, emission, and cost on aircraft.

#### SARA KAPUSCINSKA Dept. Of Mechanical Engineering

Sara Kapuścińska is entering her 4th year of Mechatronic Engineering at AGH University of Science and Technology in Cracow, Poland. She is spending the summer as a research assistant under the supervision of Dr. Alex Czekanski, in the IDEA-Lab. Specifically, Sara will be conducting experiments using Kolsky bar to determine the most optimal specifications for different pulse shaping techniques and by the end of the summer, hopes to have furthered the research to gain the optimized pulse shaper design in order to generate modified profile with constant rate of deformation of the input pulse that influences stress strain data for a particular type of tested material. This is important for better understanding of the characterisation of materials at high-strain rate and to develop dynamic tests with Kolsky bar system.

LURA





#### SHERIF IBRAHIM Dept. Of Mechanical Engineering

RAY

Sherif Ibrahim is a 2nd year student at the Lassonde School of Engineering. Having specialized in Engineering Education, Sherif is spending the summer exploring student motivations for pursuing and remaining in Engineering. Specifically, Sherif will be analyzing survey data using conducted surveys for engineering students in first, second, and third year. By the end of the summer, Sherif is hoping to have furthered the research by understand how the curricular design at Lassonde should be adapted by the faculty of engineering to give students the opportunity to fulfill their educational values throughout the course of their degree. This is important because the values exemplified by engineering education towards engineering students have a direct impact on the values engineering graduates prioritize towards society during their professional practice.



#### SOGAND TALEBI Dept. Of Mechanical Engineering

Sogand Talebi is a 3rd year student in the department of Earth and Space Sciences at the Lassonde School of Engineering. Last summer she had the opportunity to take the international Entrepreneurial Immersion course. This summer, Sogand is helping Dr. Andrew Maxwell to develop new effective ways to teach entrepreneurial concepts in STEM fields. She is currently working on two projects: First, developing and organizing the STEM Entrepreneur Bootcamp, and secondly helping with the development of the online Innovation and Creativity course. By the end of the summer, Sogand is hoping to successfully finish both projects and perform analysis to evaluate the performance of different elements within these programs.

LURA

RAY

#### ARSLAN JAVED Dept. Of Mechanical Engineering

Arslan Javed is a 4th year Mechanical Engineering Student. He is currently researching into the development of testing standards for elastomers in Equibiaxial Tension as a member of Dr. Alex Czekanski's Innovative Design and Engineering Analysis Laboratory, (IDEA-LAB). Over the course of the summer, Arslan will be conducting experimental tests using a Universal Testing Machine with a unique testing fixture designed and manufactured by the student over the past year to perform an Equibiaxial test on a specimen which the student will also be designing. He will then be creating Finite Element Models using Abaqus Software to compare with his experimental results. This research is important as there are currently no set standards for Equibiaxial Tensile Testing. This testing method is crucial to identify specific material properties of elastomers which cannot be accurately measured through other testing methods.





#### NICOLE VALKOVA Dept. of Civil Engineering

Nicole Valkova is an incoming grade 12 student at Rosedale Heights School of the Arts, and has acquired one of three internship positions in the Lassonde Women in Engineering Mentorship Program. She is spending the summer working with Dr. Usman Khan, performing research on York University's water consumption and conservation methods. By furthering this research, she hopes to educate herself and others on the issue at hand and offer suggestions concerning preservation practices. Nicole's goal for the summer is to better understand the university atmosphere and what it means to be a student to help aid her transition from high school. She is also excited to learn how to perform self-driven research as well as experience engineering as a field to help her decide if it is right for her.

50:50

#### SEJAL SAHNI Dept. of Earth & Space Science & Engineering

Sejal Sahni is entering grade 12 at North Park Secondary School, in the International Business & Technology program. She is one of the three high school students in Ontario conducting research this summer. Using her knowledge of multiple coding languages such as HTML, CSS and JavaScript, Sejal is spending the summer exploring the Measure of Accessibility to Urban Infrastructure for people with physical disabilities in Dr. Mojan Jadidi's laboratory. Specifically, Sejal will be conducting distance measurements using a 3D scanner. By the end of the summer, Sejal is hoping to have furthered the research to gain a better understanding of the accessible infrastructure at York University.

50:50





#### HASMA HABIBIY Dept. of Civil Engineering

50:50

Hasma Habibiy has completed her grade 11 year at David and Mary Thomson Collegiate Institute and will be enrolled into grade 12 the following September. Her strengths in the academic curriculum lay in mathematics and sciences as she hopes to pursue engineering as a future career. Hasma is spending her summer working with Professor Khan and engineering undergraduate students to research water utilities around the world, specifically pertaining to water conservation. Hasma is examining York University's water conveyancing system and will analyze ways for the community to practice more sustainable methods when exploiting the replenishable resource, water. Hasma hopes to attain a better understanding of the threats to the country's fresh water bodies. The importance of noting these threats and maintaining water consumption with responsibility is essential because the world s freshwater supply is limited and must be sustained so that future generations maintain easy access to the necessity.



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