Curriculum Vitae

Leo Zhu

leozhu1996.github.io |leo.zhu@mail.utoronto.ca| linkedin.com/in/leozhu1996

Currently seeking employment starting Sept 2020

Education

Master of Applied Science in Chemical Engineering, University of Toronto *(Sep 2018 - Present)*

- *Physiologically-Based Pharmacokinetic (PBPK) and Metabolism Model for Predicting Psychomotor Effects of Blood Cannabinoid and Ethanol Concentrations* (Supervised by Dr. Radhakrishnan Mahadevan)
- Developed a PBPK Model in MATLAB with literature-based parameters and data to gauge the psychomotor effects of alcohol and cannabis usage post Canadian legalization of cannabis
- Collaborated with the Center for Addiction and Mental Health (Toronto) to submit a protocol to the research ethics board for the transfer of human data for validation of the model
- Collaborated with the Thiele Lab at the National University of Ireland at Galway to implement a genome-scale model of human metabolism to the model for better predictions
- Supervised two undergraduate thesis students (Timothy Liu, William Pei) on modelling the effects of current drug therapies for hypercholesterolemia and exploring novel dietary interventions.

Bachelor of Applied Science in Chemical Engineering, University of Toronto *(Sep 2014 - Apr 2018)*

- Graduated with Honors and a minor in Bioengineering
- 3.78/4.0 cGPA
- Scored 521/528 (99th percentile) on the MCAT

Research Experience

4th-year Capstone Project, University of Toronto *(Sep 2017 - Dec 2017)*

- Collaborated with a team of six members to create a pilot plant for the production of a Carbon Negative Solution to produce Glycerol Carbonate from Biodiesel By-Products and Industrial Flue Emissions**,** performed company vision setting, plant equipment sizing & layout, process control, environment & safety considerations, economic analyses, prepared a 45-minute presentation with 3-D visualizations of the plant, and awarded the Best Process Design in the class.

Course Project, Biomedical Engineering Technology and Investigation, University of Toronto *(Sep 2017 - Dec 2017)*

- Designed experiments on the Effects of Detergents on the Removal of Gold Nanoparticles from Tumor Tissue to resolve the color-changing capabilities of gold nanoparticles in confocal microscopy imaging
- Practiced the deparaffinization and rehydration of histology slides, tissue permeabilization, silver staining, and hematoxylin & eosin staining; performed data acquisition with Leica microscopy, quantification with color deconvolution through writing macros in ImageJ, and used GraphPad Prism for statistical analysis with Tukey and Bonferroni corrections.

Undergraduate Researcher, University of Toronto *(Apr 2016 - Aug 2016)*

- Development and Transplantation of a Bioengineered Construct of the Outer Retina to Rescue Vision in Mice Models of Retinal Degeneration (Supervised by Dr. Molly Shoichet and Dr. Nikolaos Mitrousis)
- Practiced mice handling, tissue cryosectioning, and immunohistology for the verification of $NaIO_3$ models of retinal degeneration and the quantification of murine vision over a longitudinal study,
- Utilized Confocal Microscopy, Image J and ANOVA for data collection and analysis, resulting in the production of end-point retinal morphology figures for publication and presentations.

Undergraduate Researcher, University of Toronto *(Oct 2015 - Mar 2016)*

- Transcutaneous Stimulation of the Posterior Tibial Nerve and Saphenous Nerves to Alleviate the Symptoms of Overactive Bladders (Supervised by Dr. Paul Yoo)
- Organized a team of six students to create a literature review of existing treatments of Overactive Bladder, developed an experimental protocol involving volunteers and consent forms, created a Research Ethics Board approved study on a cohort of human subjects, and culminating in a presentation.

Undergraduate Researcher, University of Toronto *(Jan 2015 - Apr 2015)*

- Initiated an independent research portfolio for the Assessment of King's College Circle to Improve Pedestrian Safety at the University of Toronto, performed goal setting and vision development with team members, outreached to administration and urban planning professors for resources, and published a report suggesting a plaza to allow 86,000+ students to safely travel across campus.

Publications & Presentations

Peer Reviewed

1. Nikolaos Mitrousis, Sabiha Hacibekiroglu, Katariina Mamia, *Zhengyue Zhu*, Beatrice Ballarin, Peter Poon, Vallerie A. Wallace, Yves Sauve, Andras Nagy, Derek van der Kooy, Molly S. Shoichet; **Co-transplantation of RPE and photoreceptors rescues vision in a mouse model of advanced retinal degeneration.** *Invest. Ophthalmol. Vis. Sci.* 2018;59(9):3261. 2018. [journal]

Non-Peer Reviewed

2. *Leo Zhu*, William Pei, Radhakrishna Mahadevan; **PBPK Model for Predicting the Effects of Cannabis and Ethanol on Driving**. *Biomedical Engineering Society Annual Meeting*. Philadelphia, 2019. [poster]

3. *Leo Zhu*, Radhakrishna Mahadevan; **Whole Body Metabolism Model for Predicting Blood Cannabinoid Concentrations**. *Synthetic Biology Symposium 4.0*. Waterloo, 2019. [abstract][oral][poster]

4. *Leo Zhu*, Radhakrishna Mahadevan; **Whole Body Metabolism Model for Predicting Blood Cannabinoid Concentrations**. *Toronto Cannabis and Cannabinoid Research Consortium*. Toronto, 2019. [abstract][poster]

5. *Leo Zhu*, Radhakrishna Mahadevan; **Multiscale Modelling of Blood Cannabinoid Concentrations**. *Statistics and Control*. Toronto, 2019. [oral]

6. *Leo Zhu*; **How I scored 99th percentile on the MCAT.** *Independently-hosted Seminar.* Toronto, 2019. [oral].

7. *Leo Zhu*, Radhakrishna Mahadevan; **Multiscale Metabolic Modelling for Predicting Blood Cannabinoid Concentrations**. *BioZone Fall Symposium*. Toronto, 2018. [3-minute thesis]

8. Sabrina Sikora, Tania Das, Mahmoud Ali, Delin Mu, Sean Cuthbertson, *Leo Zhu*; **Pilot Plant for Glycerol Carbonate Production from a Biodiesel By-Product and Industrial Flue Emissions.** *33rd Annual Chemical Engineering Dinner.* Toronto, 2018. [poster]

9. *Leo Zhu*, Nikolaos Mitrousis, Molly Shoichet; **Co-Injection of RPE and Photoreceptor Cells to Rescue Vision in Retinal Degeneration**. *Undergraduate Engineering Research Day*. Toronto, 2016. [abstract] [oral]

10. *Leo Zhu*, Nikolaos Mitrousis, Molly Shoichet; **Reversing the Effects of Retinal Degeneration**. *Canadian Society for Chemical Engineering Symposium*. Toronto, 2016. [oral]

11. Nabaa Al Kassab, Liam D'Souza, Kelly Hunter, Peter Kim, *Leo Zhu*; **Transcutaneous Stimulation of the Posterior Tibial and Saphenous Nerves.** *Galbraith Society Research Experience Program Final Presentation.* Toronto, 2016. [oral]

12. Stephen Xu, *Leo Zhu*, et al.; **Improving the Safety of King's College Circle.** *Student Research Teams 2014-2015 Annual Report.* Toronto, 2015. [report]

Work Experience

Life Science Curriculum Developer, Top Knowledge *(Aug 2019 - Present)*

- Developed teaching curricula and accompanying study guides in accordance with current university materials (BIO120, BIO130), taught weekly offline and online classes in Mandarin and utilized flipped classroom methodologies to record review videos in English, provided live support via WeChat Messenger, increases term grades from a class average of 47% to 74%.

MCAT Instructor, Kaplan *(Dec 2017 - Present)*

- Prepared three cohorts of students for the Medical College Admissions Test by utilizing the Socratic method for active engagement in the classroom, assisted with online help sessions, and coached students on the importance of time management and schedule planning to guide them in their journey towards medical school, resulting in an average increase of MCAT scores of 20 points, an average score of 514 (93rd percentile), and an instructor satisfaction rating of 9.7/10.

DJ Entrepreneurship: ZhuKeeper *(Nov 2014 - Present)*

- Developed a brand via creating a social media following of 510, utilized marketing strategies to realize a net profit of over $10000, performed for Dreams Music Festival 2019 (Toronto), Fifth Social Club, Shangri-La, Steam Whistle Brewery, and many other high profile clients, headlined for events with more than 1200 attendees.

Product Development Consultant, VeloxCann *(Sep 2019 - Present)*

Private Tutor *(Sep 2019 - Present)*

Teaching Assistant, University of Toronto *(Sep 2018 - Apr 2020)*

- Engineering Strategies and Practice (APS112/113): Guided a total of 133 students through the engineering design process, provided weekly feedback on reports and professionalism, advised students on the semantics of engineering communication documents.
- Applied Differential Equations (CHE222): Created course content for weekly tutorial sessions, hosted both online and offline teaching sessions, monitored and assisted students in solving chemical engineering-based differential equations problems in MATLAB, nominated for a Teaching Assistant Award.

Volunteering

Social Media Manager, COVID-19 Recoveryl *(Mar 2020 - Present)*

- Compiled daily uplifting news content surrounding the COVID-19 pandemic to spread positivity amidst negative media coverage, created web content, and disseminated via Instagram, Facebook, and website, resulting in over 22,000 unique site visitors, 317 Instagram followers, and 284 Facebook followers.
- Received press coverage from Curiocity, 11Alive (Atlanta), University of Toronto.

Volunteer, Multidisciplinary Association of Psychedelic Studies *(Mar 2020 - Present)*

Greeter and Surgical Clerk Volunteer, Mount Sinai Hospital *(May 2017 - May 2018)*

- Elective Outpatient Surgery Unit: Observed surgeries in urology with fertility and andropause directors, practiced intubation, laparoscopy, and suturing on dummies, acquired insight into surgical logistics provided post-op care for patients with refreshments and amenities, assisted and provided care for patients with mental disabilities.
- Information Desk: Directed patients and families to desired locations in a rapid yet friendly manner, updated directory with new information, assisted patients with wheelchair transport and calling taxis, assisted EOPS ward clerks in unit paperwork, interpreted for mandarin-speaking families.

Kitchen Cook and Dishwasher Volunteer, St. Felix Center *(Aug 2016 - May 2018)*

- Assisted staff in cooking and serving for struggling economically families, mentored new volunteers to quickly adjust to work pace, optimized food handling and plating with a continuous product line to increase throughput by 40%,
- Created a dishwashing system to eliminate downtime during operation, worked with peers to create over 100 meals a day under strict time constraints
- Served as liaison between St. Felix Center and campus groups to increase community engagement during holiday seasons.

Leadership Experience

Founder/President, University of Toronto Psychonaut Journal Club *(Feb 2020 - Present)*

- Organized and hosted monthly academic discussions on the academic research of psychedelic substances and investigate their implications in translational medicine
- Invited guest lecturers to present their cutting edge research to the group, followed by discussion and critique of recently published literature

Internal Communications Coordinator, BioZone Council *(Jan 2019 - Present)*

- Organized internal communications within the graduate department, planned monthly meetings, social events and contributed to newsletters.
- Planned and assisted in the execution of the annual BioZone Research Symposium and the Science Rendezvous for educating primary school children on bioengineering.

Vice President/Treasurer/Social Chair, Sigma Chi Fraternity, Beta Omega Chapter *(Apr 2017 - Apr 2020)*

- Vice President: Spearheaded and executed the development of various social, philanthropic, and outreach projects, organized and led weekly meetings with an executive team of 11 members, pioneered and promoted an annual welcome event for 1200 incoming students, trained at a week-long leadership summit on improving adaptability and emotional intelligence, increasing cumulative membership by 51, and increasing social media following by 37%
- Treasurer: Allocated and managed a budget of $38400 to ensure proper committee function, programmed and converted budget management to an automated digital system with precise recordkeeping to improve transparency and precision, ultimately resulting in the creation of same-day reimbursements, and fully subsidizing the year-end formal event for all members and guests with an annual budget saving of $8000.

Founder/President, University of Toronto Electronic Music Community *(Jan 2017 - Apr 2019)*

- Established a community for electronic music enthusiasts across three campuses, created social media outlets to build brand name recognition, recruited membership via ticket raffles, event meet-ups, dance lessons, and DJ tutorials.
- Organized four successful music events involving the planning of logistics, designing of five different stages, and hiring 23 DJs, cumulatively engaging 44600 netizens, selling over 600 tickets to collect over $2780.00 in reinvested profits and $415 donated to Covenant House Toronto to assist underprivileged youth, ultimately growing the club to 615 members.

Outreach Chair, University of Toronto Engineering Society *(Mar 2016 - Sep 2016)*

- Consolidated a list of 115 companies to generate sponsorship revenue for incoming student orientation week, communicated with six internal subcommittees to allocate sponsorship deals, resulting in a 100% increase in the numbers of sponsors from previous years and an additional $2000 added to the overall orientation week budget.

Orientation Package Chair, University of Toronto Engineering Society *(Mar 2015 - Sep 2015)*

- Managed a budget of $55000 for the creation of welcome packages for incoming students, negotiated with five different suppliers for cost optimization, organized and created distribution logistics involving the recruitment of 25 volunteers, and collaborated with marketing and sponsorship chairs to produce 1200 Orientation Packages with a cost reduction of 20%, and an increase in package contents of 30% compared to previous years.

Moderator/Manager, Model United Nations *(Sep 2010 - Apr 2018)*

- Researched and designed debate topics for Model United Nation conferences at both highschool and university levels, planned and executed simulated crises related to Rio Olympics (UTMUN 2016), 30 Years' War (SSICSIM 2017), Lebanese Civil War (UTMUN 2017), Colombia Congress (NAMUN 2018), and the World Health Organization (OMWHO 2018) in sessions ranging from 20 to 100 participants.

Awards

Mclean Foundation Graduate Scholarships *(Sep 2019)* - $15000
Highest GPA Award *(Apr 2019)* - Sigma Chi Fraternity, $1000
NSERC Create M3 *(Sep 2018)* - NSERC, $15000
2nd Highest GPA Award *(Apr 2018)* - Sigma Chi Fraternity, $750
University of Toronto Dean's List *(2015 - 2018)*
2nd Highest GPA Award *(Apr 2017)* - Sigma Chi Fraternity, $750
Best Plant Design Process Engineering *(Mar 2017)*
Horizons Leadership Development Scholarship *(Jul 2017)* - Sigma Chi Fraternity, $2700
NSERC Undergraduate Student Research Awards *(May 2016)* - NSERC, $4500

Other Interests & Experiences

Muay Thai *(Sep 2019 - Present)*

Weightlifting *(Sep 2012 - Present)*

New Dragons Dragon Boat Team *(Sep 2016 - Jul 2018)*

- Placed 2nd place internationally at the 2018 Club Crew World Championships in Szeged, Hungary for the open 2000m and 200m, mentored novice weightlifters in biweekly training regimen

Track & Field *(Sep 2011 - Apr 2014)*

- Placed 3rd place in New York State Qualifiers in Triple Jump
- Records can be found on NY Milesplit

Violin *(Sep 2006 - Sep 2016)*

- SKULE Orchestra Concertmaster (*Sep 2015 - Apr 2016*)
- All Nationals Honors Ensemble *(2013)*
- All Eastern Orchestra *(2013)*
- New York Conference All State Orchestra 3rd chair *(2012)*

Independent Contractor *(May 2018 - Sep 2018)*

Host and Food Handler, Fifth Social Club *(May 2018 - Jul 2018)*

Campus Ambassador, One Class *(Feb 2016 - Jun 2016)*

Line Chef, Burger King *(Aug 2014 - Oct 2014)*