Edward (Eddie) Guo

(587) 988-0292 ◇ 305D 1919 University Dr NW, Calgary, AB, T2N 4K4
eddie.guo@ucalgary.ca ◇ linkedin.com/in/eguo1 ◇ www.eddieguo.ca

Education

University of Calgary 2022 – 2025
Doctor of Medicine (MD)
- President of the Class of 2025; principal investigator for the project "ChatGPT for clinical question generation"
- Awarded OpenAI grant to investigate clinical large language models
- 17 peer-reviewed publications (10 first-author) to date
- USMLE Step 1 (Pass)

University of Alberta 2020 – 2022
Bachelor of Science, Engineering Physics (Partially completed degree) GPA: 4.00/4.00
- Top GPA in cohort; top of class in multivariable/vector calculus
- Awarded exoskeleton artificial intelligence research grants

New College, University of Oxford 2021
Study Abroad, Magnetic Resonance Imaging and Stem Cell Engineering First Class Honours

University of Alberta 2018 – 2020
Bachelor of Science Honours, Neuroscience (Partially completed degree) GPA: 4.00/4.00
- Top of class in English critical analysis and organic chemistry II
- Awarded nerve regeneration research grants

Leadership and Volunteering

Medical Education Working Group Feb 2023 – Present
Co-Founder and Editor-In-Chief
- Created OSCE-GPT, an AI-powered app that offers communications and medical management practice with images, medical documentation, and feedback; 5,000+ users in 60+ countries; used by classes in the University of Calgary to teach its medical and nursing students
- Collaborating on OSCE-GPT with *Medical schools* – McMaster, Ottawa; *Neurosurgery residents* – Calgary, Toronto; *Dermatology residents* – Calgary, Toronto; *Ophthalmology residents* – Toronto, McGill; *Allied Health* – Alberta Association of Nurses, Manitoba nursing, SAIT respiratory therapy
- Media coverage on OSCE-GPT: UCalgary News, The Globe and Mail, Toronto Star, CBC, Global News, CTV News
- Created a Toronto Notes GPT, an AI model that provides medical knowledge using the Toronto Notes; creating a medical question bank in collaboration with Toronto Notes and University of Calgary Cards
- Created PrepCaRMS, an AI-powered app that offers interview practice with all CaRMS R-1 specialties (users speak to their device and then it speaks back) and feedback based on the interview

Calgary Medical Students' Association (CMSA) Sep 2022 – Present
President
- Chairing the Independent Student Analysis Committee for 2024 accreditation cycle of the Calgary MD Program by the Committee on Accreditation of Canadian Medical Schools (a 2-year process)
- Created an online platform for students to share and access study materials; created more than 1 GB of videos on course concepts, school notes, tools for career exploration, exams, shadowing, research
- Developed a financial strategy resulting in a 5% annual revenue growth for the CMSA, excluding student fees
- Organized embroidered Patagonia merchandise for all Calgary MD students; acquired a 40% discount and 14-day free trial for AMBOSS for all Calgary MD students

Youreka Canada Feb 2019 – Jun 2023
Vice President, Department of Programs
- Collaborated on national equity, diversity, and inclusion policies affecting 200+ students across Canada
- Developed national and international expansion plans for regional Youreka branches
- Led a team of 17 PhD, MD, and BSc students to create and deliver the Youreka national curriculum; generated 60,000+ hours of research education for 1,000+ high school and undergraduate students annually across Canada

- Spearheaded the first professional development and pedagogy training for 17 undergraduate teachers across Canada
- Taught a ten-week science program to a cohort of 30 high school and undergraduate students in Edmonton
- Spearheaded a pilot project for Youreka Edmonton that doubled student enrollment from 30 to 60 students from 2019 to 2020

Research Experience

Project neuroArm   Jul 2022 – Present
Research Trainee (PI: Dr. Garnette Sutherland, Div. of Neurosurgery)
- Creating large language model apps for physician consultation, automated notes, and education
- Designing machine learning-driven platforms for surgical devices and education; projects include automatic surgeon identification using their surgical tool force profile, quantification of force components which differentiate 'expert' vs 'novice' surgeons, and an end-to-end platform to track surgical trainee progress
- Created neuroGPT-X, a chat-based app for physicians for vestibular schwannoma; media: Editorial. Who, or what, to believe by Mayo Clinic surgeons (Journal of Neurosurgery)
- Created Eloquent Aid, an AI-powered app to assist identification of eloquent brain regions during awake craniotomies; users complete image-based tasks by speaking, and the app determines whether the answer is correct in real time

Telerobotic and Biorobotic Systems Group   Sep 2021 – Jun 2023
Research Assistant (PI: Dr. Mahdi Tavakoli, Dept. of Electrical and Computer Engineering)
- Designed reinforcement learning algorithms for exoskeletons to personalize the patient rehabilitation process; implemented the TD3 algorithm with a lower limb exoskeleton to set a user's desired walking speed; manuscript published in ICRA 2023; media: CTV and University of Alberta interviews
- Led the development of a voice-controlled exoskeleton; users complete tasks 54% faster than using a mobile app

Publications

Manuscripts

1. Y. Park, A. Pillai, J. Deng, **E. Guo**, M. Gupta, M. Paget, T. Champagne, C. Naugler*, "Assessing the research landscape and utility of large language models in the clinical setting: A scoping review," *BMC Medical Informatics and Decision Making* [accepted].

2. J. S.G. Pascual, **E. Guo**, R. Yang, K. D. Langdon, S. Lama, G. Sutherland*, "Ruptured pial-pial collateral aneurysm associated with left internal carotid artery occlusion: Nuances of surgical management," *Journal of Neurosurgery: Case Lessons* [accepted].

3. **E. Guo**, C. Perlette, M. Sharifi, L. Grasse, M. Tata, V. K. Mushahwar, M. Tavakoli*, "Speech-Based Human-Exoskeleton Interaction for Lower Limb Motion Planning," *IEEE International Conference on Human-Machine Systems* [accepted].

4. **E. Guo***, M. Gupta, J. Deng, Y. Park, M. Paget, C. Naugler, "Automated Paper Screening for Clinical Reviews Using Large Language Models: Data Analysis Study," *Journal of Medical Internet Research*, Jan. 2024, doi: 10.2196/48996.

5. **E. Guo**, M. Gupta, S. Sinha, K. Rössler, M. Tatagiba, R. Akagami, O. Al-Mefty, T. Sugiyama, P.E. Stieg, G.E. Pickett, M. de Lotbiniere-Bassett, R. Singh, S. Lama, G. Sutherland*, "neuroGPT-X: Towards a Clinic-Ready Large Language Model," *Journal of Neurosurgery*, Oct. 2023, doi: 10.3171/2023.7.JNS23573.

6. A. Baghdadi, **E. Guo**, R. Singh, S. Lama, G. Sutherland*, "Force Profile as Surgeon-Specific Signature," *Annals of Surgery Open*, Sep. 2023, doi: 10.1097/AS9.0000000000000326.

7. S. Samnani, F. Sachedina, M. Gupta, **E. Guo**, V. Navani*, "Mechanisms and clinical implications in renal carcinoma resistance: narrative review of immune checkpoint inhibitors," *Cancer Drug Resistance*, Jun. 2023, doi: 10.20517/cdr.2023.02.

8. J. K. Mehr, **E. Guo**, M. Akbari, V. K. Mushahwar, M. Tavakoli*, "Deep Reinforcement Learning Based Personalized Locomotion Planning for Lower-Limb Exoskeletons," *2023 IEEE International Conference on Robotics and Automation (ICRA)*, London, United Kingdom, 2023, pp. 5127-5133, doi: 10.1109/ICRA48891.2023.10161559.

9. S. Becker, D. Clark*, M. Gupta, S. Kannappan, B. Wong, E. Hernandez-Zavaleta, and **E. Guo**, "More than a Eureka Moment: Undergraduate Students' Reflective Understanding of Science Inquiry in a Citizen Science Project," *Alberta Science Education Journal*, vol. 48, no. 1, pp. 22-36, Jun. 2022.

10. **E. Guo***, P. Torabi, D. E. Nielsen, and M. Pietrosanu, "Deep learning transcriptomic model for prediction of pan-drug chemotherapeutic sensitivity," *STEM Fellowship Journal*, Jan. 2022, doi: 10.17975/sfj-2021-013.

Invited Talks

1. **E. Guo**, "IEEE Humangineering Series: Changing the Medical Landscape with LLMs," *IEEE Sight, Schulich School of Engineering, University of Calgary*, Jan. 11, 2024, available: https://www.beautiful.ai/player/-Nnu39LC0KXOwUhbIZ0E.

Conferences

1. A. Pillai, **E. Guo***, M. Gupta, "Assessing GPT-4 with vision for automated question explanations in undergraduate medical education," *OHMES Health & Medical Education Scholarship Symposium*, Feb. 21, 2024 [accepted].

2. Y.J. Park, B. Ma, **E. Guo**, M. Gupta, M. Ramien*, "RIME-GPT: Leveraging AI to provide real-time, personalized clinical support for pediatric reactive infectious mucocutaneous eruptions (RIME)," *Pediatric Dermatology Research Alliance*, Nov. 9-11, 2023.

3. **E. Guo**, M. Gupta, H. Rossong, S. Lama, G. Sutherland*, "A cost analysis of brain and nervous system cancer care: an examination of healthcare expenditure trends in the United States from 1996 to 2016," *Neuro-Oncology*, Vancouver, BC, Canada, Nov. 15-19, 2023, vol. 25, pp. v122-v123, doi: 10.1093/neuonc/noad179.0464.

4. **E. Guo**, M. Gupta, S. Sinha, K. Rössler, M. Tatagiba, R. Akagami, O. Al-Mefty, T. Sugiyama, P.E. Stieg, G.E. Pickett, M. de Lotbiniere-Bassett, R. Singh, S. Lama, G. Sutherland*, "neuroGPT-X: Advancing Responsible Large Language Models for Clinical Use," *CNS 2023*, Washington, DC, USA, Sep. 9-13, 2023.

5. **E. Guo**, M. Gupta, B. Wong, J. Ali, A. Pillai, P. Torabi, M. Paget, C. Naugler*, "Performance of ChatGPT on Case-Based Clinical Scenarios: Potential for Incremental Utility of Large Language Models in Medical Education," *Association for Medical Education in Europe Glasgow 2023*, Glasgow, Scotland, Aug. 26-30, 2023, doi: 10.21955/mep.1115122.1.

6. **E. Guo***, M. Gupta, J. Ali, A. Pillai, P. Torabi, "Large Language Models: Practicing Clinical Decision Making," *Health and Medical Education Scholarship Symposium*, Calgary, AB, Canada, May 11, 2023.

7. **E. Guo**, A. Baghdadi, R. Singh, S. Lama, G. Sutherland*, "What Makes a Surgeon Unique? Machine Learning for Surgeon Identification Using Their Force Profile," *2023 AANS Annual Scientific Meeting*, Los Angeles, CA, USA, Apr. 21-24, 2023.

8. **E. Guo**, A. Baghdadi, R. Singh, S. Lama, G. Sutherland*, "Machine Learning Characterization of Important Tool-Tissue Interaction Forces Using Bipolar Forceps," *2023 AANS Annual Scientific Meeting*, Los Angeles, CA, USA, Apr. 21-24, 2023.

9. S. Becker, D. Clark*, M. Gupta, S. Kannappan, B. Wong, **E. Guo**, and E. Hernandez-Zavaleta, "Deepening Undergraduate Student Understanding of Science Inquiry by Reflecting on the Creation and Enactment of a Citizen Science Project," *Canadian Society for the Study of Education XLIX Annual Conference*, Canada, May 30-June 3, 2021.

Preprints

1. Y. Park, A. Pillai, J. Deng, **E. Guo**, M. Gupta, M. Paget, T. Champagne, C. Naugler*, "Assessing the research landscape and utility of large language models in the clinical setting: A scoping review," *Research Square*, Oct. 30, 2023, doi: 10.21203/rs.3.rs-3472000/v1.

2. **E. Guo**, C. Perlette, M. Sharifi, L. Grasse, M. Tata, V. K. Mushahwar, M. Tavakoli*, "Speech-Based Human-Exoskeleton Interaction for Lower Limb Motion Planning," *arXiv*, Oct. 4, 2023, doi: 10.48550/arXiv.2310.03137.

3. **E. Guo***, M. Gupta, J. Deng, Y. Park, M. Paget, C. Naugler, "Automated Paper Screening for Clinical Reviews Using Large Language Models," *arXiv*, May 2, 2023, doi: 10.48550/arXiv.2305.00844.

4. **E. Guo**, M. Gupta, S. Sinha, K. Rössler, M. Tatagiba, R. Akagami, O. Al-Mefty, T. Sugiyama, P.E. Stieg, G.E. Pickett, M. de Lotbiniere-Bassett, R. Singh, S. Lama, G. Sutherland*, "neuroGPT-X: Towards an Accountable Expert Opinion Tool for Vestibular Schwannoma," *medRxiv*, Feb. 26, 2023, doi: 10.1101/2023.02.25.23286117.

Datasets & Registrations

1. R. Ramchandani, J. Le, **E. Guo**, K. Oxford, G. Anicho-Okereke, R. Shorr, T. Eskander, L. Caulley, "Exploring the Influence of Demographic Factors on Endotracheal Tube and Laryngeal Mask Airway Insertion," PROSPERO 2024, available: CRD42024495263.

2. **E. Guo***, M. Gupta, J. Deng, Y. Park, M. Paget, C. Naugler, "Automated Paper Screening for Clinical Reviews Using Large Language Models," *Mendeley Data*, V1, May 1, 2023, doi: 10.17632/np79tmhkh5.1.

3. Y-J. Park, J. Deng, A. Pillai, M. Gupta, **E. Guo***, Mike Paget, and Christopher Naugler, "Assessing the research landscape and utility of LLMs in the clinical setting: protocol for a scoping review," Mar. 28, 2023, doi: 10.17605/OSF.IO/498K6.

4. **E. Guo**, M. Gupta, S. Sinha, K. Rössler, M. Tatagiba, R. Akagami, O. Al-Mefty, T. Sugiyama, P.E. Stieg, G.E. Pickett, M. de Lotbiniere-Bassett, R. Singh, S. Lama, G. Sutherland*, "neuroGPT-X: Towards an Accountable Expert Opinion Tool for Vestibular Schwannoma," *Mendeley Data*, V1, Feb. 27, 2023, doi: 10.17632/b9mck42r35.1.

Educational Materials

1. Led the creation of the Independent Student Analysis for the 2022-2024 accreditation cycle of the Cumming School of Medicine MD Program; this 57-page report is the first of its kind to incorporate large language models into policy recommendations for accreditation of a Canadian MD program (Dec 2022 – Oct 2023)

2. Created A Gentle Introduction to Data Science with R, an interactive e-textbook on R programming and data science used by 1,000+ students across Canada (Dec 2020 – May 2022)

3. Founded the Atom Magazine for Engineering Physics; first issue attracted 300+ readers in 6 countries (Dec 2021 – Feb 2022)

Selected Research Grants (of 15)

OpenAI Researcher Access Program Grant   Jul 2023
- Awarded for research to develop responsible large language models in medicine

Ontario Medical Student Education Research Grant   May 2023
- Awarded to create an interactive app for dermatology trainees to practice oral examinations (co-awarded with Ye-Jean Park and Dr. Mehul Gupta; PI: Dr. Trevor Champagne)

NSERC Undergraduate Student Researcher Award   Mar 2022
- Awarded for project titled "Intelligent control of a lower-limb exoskeleton"

Dean's Research Award   Sep 2021
- Awarded for project titled "Speech-based locomotion planning for lower-limb exoskeletons"

Alberta Innovates Summer Research Studentship   Apr 2020
- Awarded for project titled "Skin and Nerves: Understanding the dialogue between axons and skin cells to restore sensation"

Office of the Provost and VP (Academic) Summer Studentship Award   May 2019
- Awarded for project titled "Axon regrowth and plasticity in diabetic neuropathy: the role of growth cone molecules"

Selected Scholarships and Awards (of 22)

Cumming School of Medicine Tuition Reinvestment Bursary   Dec 2023
- Offered annually to undergraduate students enrolled in the Cumming School of Medicine, MD Program

Louise McKinney Post-Secondary Scholarship   Dec 2019, Sep 2020, Nov 2022
- Awarded on the basis of superior academic achievement (top 1.5-2% of faculty) to students at the University of Alberta and Calgary who are also Alberta residents; awarded for the 2018/19, 2019/20, and 2021/22 academic terms

Peter Lougheed Scholarship   Sep 2021
- Awarded to University of Alberta students who demonstrate leadership through involvement in university or community organizations, sports activities, or cultural activities and academic achievement

Undergraduate Big Data Challenge Research Excellence Award   Jul 2020
- Used unsupervised learning, feature selection algorithms, and neural networks to predict cancer response to chemotherapeutics

Alberta Innovates COVID-19 Hackathon Post-Secondary Student Award   May 2020
- Created an interactive app to model how COVID-19 spreads given age, poverty, income, and population density
- Media coverage: University of Alberta Folio article and the Genome Alberta podcast

Sci5 Outstanding Achievement in Science Scholarship   Apr 2019, Mar 2020
- 2020 criteria: awarded to 4 well-rounded students with strong academic achievement, extracurricular involvement, and recommendation letters in the Faculty of Science at the University of Alberta
- 2019 criteria: awarded to the top 5 students based on GPA in the Faculty of Science at the University of Alberta who also demonstrate exceptional extracurricular activities

T4K Undergraduate Leadership Scholarship   Sep 2019
- Awarded to students at the University of Alberta with superior academic achievement who demonstrate leadership through involvement and participation in university or community organizations, sports activities, or cultural activities

Employment

University of Alberta   Sep 2020 – Apr 2022
Teaching Assistant, Introduction to Tangible Computing I & II (CMPUT 274 & 275)
- Supported a class of 160+ students to understand algorithms and data structures in Python and C++
- Received an overall effectiveness rating of 93% from anonymized student feedback surveys
- Collaborated with a team of 16 teaching assistants to facilitate course delivery

Edmonton Fencing Club   Nov 2016 – Oct 2020
Fencing Coach
- Coached children and teenagers and engaged their parents about their child's progress
- Gave private lessons, taught strategic fencing thinking, and resolved student conflicts

Media Coverage

Editorials

1. Journal of Neurosurgery, Michael J. Link, MD and Matthew L. Carlson, MD: Editorial. Who, or what, to believe   Oct 2023

Podcasts

1. Journey to Medicine, Spotify, Nathan Barreth: E5 - Eddie Guo: Find Your Reason   Dec 2023

News Outlets

1. AgeTech World, Jane Hall: New AI app could hold key to better older patient-doctor communication   Oct 2023
2. The Canadian Press: Calgary med student develops AI patient program   Sep 2023
3. CBC, Bill Graveland: New app uses AI to help Calgary medical students practise interacting with patients   Sep 2023
4. L'actualité: Bill Graveland: Un étudiant de Calgary crée une application pour former les futurs médecins   Sep 2023
5. Noovo Info, Bill Graveland: De futurs médecins formès avec une application?   Sep 2023
6. U of C UToday, Kelly Johnston: UCalgary students create app to help medical students learn how to talk to patients   Sep 2023
7. CTV News Edmonton, Adam Lachacz: U of A integrating artificial intelligence into exoskeleton technology   Aug 2022
8. U of A Folio, Michael Brown: Students develop online tool to predict COVID-19 spread based on demographics   Jul 2020
9. Cybera: Alberta Innovates Announces Results from COVID-19 Data Science Hackathon   May 2020
10. Alberta Innovates: Flattening the Curve and Promoting Economic Recovery through Innovation   May 2020
11. CBC, The Canadian Press: Table tennis player, 10, turning heads in Halifax   Feb 2011
12. The Globe and Mail, Oliver Moore: Just 10, Eddie has small size, huge potential   Feb 2011
13. Toronto Star: 10-year-old table tennis star competes against pros   Feb 2011
14. Goverment of Alberta: Team Alberta named for Canada Winter Games   Jan 2011

Selected Sports Awards

Fencing (Foil)   2011 – 2020
- Accepted annually as a High Performance Program Athlete with the Canadian Fencing Federation   2013 – 2018
- Medalled in 5 Canadian national competitions in the open, U20, U17, and U13 categories   2013 – 2018
- Achieved USA Fencing A16 ranking (highest ranking in USA Fencing)   2016
- 23rd Place Guatemala Junior (U20) World Cup; represented Team Canada   2016

Table Tennis   2007 – 2012
- Medalled in every competition (50+ national and local events) in U13 and U11 singles, doubles, and team events   2008 – 2012
- Youngest athlete at the Halifax Canada Winter Games; media coverage: CBC Sports and Toronto Star   2011

Skills and Hobbies

Certifications	USMLE Step 1, Standard First Aid CPR and AED Level C, Basic Life Support, DELF B1
Skills	Machine learning, deep learning, reinforcement learning, data science, teaching, curriculum development
Software	R, Python, C++, MATLAB, Simulink, VHDL, Git, LaTeX, HTML, CSS, JavaScript, Node.JS
Professional Societies	Congress of Neurological Surgeons, Institute of Electrical and Electronics Engineers (IEEE)
Hobbies & Interests	Billiards, programming, running, soccer, reading, physics