Edward (Eddie) Guo

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Education

University of Calgary 2022 – 2025
Doctor of Medicine (MD)
- Elected President of the Calgary Medical Students' Association
- Published 36 peer-reviewed publications (16 first-author); USMLE Step 1 (passed); USMLE Step 2 CK (scheduled)
- Awarded grants from OpenAI, Microsoft, Calgary Department of Surgery, and University of Calgary Students' Union to develop large language model platforms for medical education and clinical practice

University of Alberta 2018 – 2022
BSc Engineering Physics and BSc Hons Neuroscience (Partially completed degrees) GPA: 4.00/4.00
- Top GPA in Engineering Physics cohort
- Transferred from Neuroscience to Engineering Physics after 2 years
- Awarded research grants for combining artificial intelligence with rehabilitation exoskeletons
- Studied abroad at New College, University of Oxford in 2021 (First Class Honours)

Clinical Electives

Neurosurgery, Toronto Western Hospital, University of Toronto (2 weeks)	Sep 2024
Neurosurgery, Foothills Medical Centre, University of Calgary (2 weeks)	Sep 2024
Neurosurgery, Health Sciences Centre, University of Manitoba (2 weeks)	Aug 2024
Neurosurgery, Foothills Medical Centre, University of Calgary (1 week, selective)	Aug 2024
Critical Care Medicine (Neuro Pod), Foothills Medical Centre, University of Calgary (4 weeks)	Jul 2024
Radiology, The Ottawa Hospital, University of Ottawa (2 weeks)	May 2024
Trauma Surgery, Foothills Medical Centre, University of Calgary (2 weeks)	Apr 2024
Neurosurgery, Walter C. Mackenzie Health Sciences Centre, University of Alberta (2 weeks)	Apr 2024
Neurology, South Health Campus, University of Calgary (2 weeks)	Mar 2024
Neuropathology, Foothills Medical Centre, University of Calgary (2 weeks)	Mar 2024
Neurosurgery, Brigham and Women's Hospital, Harvard Medical School (2 weeks, preclerkship)	Jul 2023

Leadership and Volunteering

OSCEai Feb 2023 – Present
Co-Creator and Principal Software Developer
- Created a generative AI app called OSCEai that offers communications and medical management practice with images, medical documentation, and feedback; 10,000+ users in 80+ countries
- Led the coding, testing, deployment, outreach, research, grant funding, and marketization phases of OSCEai
- Used in the University of Calgary preclerkship curriculum for medical students, NURS 289 for Calgary nursing students, and University of Manitoba for nursing students; collaborating with Calgary, McMaster, Ottawa, UBC medical schools to provide history taking and medical management practice with simulated patient cases
- Working with neurosurgery programs across the country, dermatology residents at Calgary and Toronto, and ophthalmology residents at Toronto and McGill for research into OSCEai's effectiveness in postgraduate medical education
- Collaborating with Alberta Association of Nurses, Calgary nursing, Manitoba nursing, SAIT respiratory therapy for medical communications practice for their students
- Media coverage: UCalgary News, The Globe and Mail, Toronto Star, CBC, Global News, CTV News, AgeTech World

Calgary Medical Students' Association (CMSA) Sep 2022 – Present
President (Elected)
- Represented and advocated on behalf of 400+ MD students at the Cumming School of Medicine with faculty, administration, and corporate stakeholders; collaborated with Deans and medical student leaders at national conferences to develop and implement policies affecting all Canadian medical students (e.g., advocating to maintain Family Medicine as a 2-year residency)
- Chaired the Independent Student Analysis (ISA) Committee for 2024 accreditation cycle of the Calgary MD Program by the Committee on Accreditation of Canadian Medical Schools (a 2-year process); led a team of 11 students and public health researchers to create a 58-page report on strengths, weaknesses, and recommendations for the Calgary MD program

- Advocated for and implemented "hot spot" reporting for identification of clerkship rotation sites with mistreatment issues; all clerkship rotation feedback surveys now have anonymous student reporting options
- Collaborated with faculty to create a response protocol package for students in crisis (e.g., self-harm, acute health crisis)
- 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

Medical Education Working Group Feb 2023 – Present

Co-Founder, Editor-In-Chief, and Principal Software Developer

- Created On Call Scheduler, an automatic call shift scheduler that optimizes time off and load balancing across team members with statistics per individual; the app allows export of the generated schedule to calendar apps and Microsoft Word
- Created a Toronto Notes GPT to provide medical knowledge using Toronto Notes and ChatGPT
- Created the Royal College Oral Practice App to provide practice and feedback for Canadian residents oral board exams
- Created MedNoteAI app for automated generation of notes and questions from lecture videos, audio, and PDFs

Youreka Canada Feb 2019 – Jun 2023

Vice President, Department of Programs

- 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
- 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
- Taught a ten-week science program to a cohort of 30 high school and undergraduate students in Edmonton

Research Experience

Project neuroArm Jul 2022 – Present

Research Trainee (PI: Dr. Garnette Sutherland, Div. of Neurosurgery)

- Designing machine learning and language model platforms for surgical devices and education; projects include automatic surgeon identification using their bipolar forceps force profile, quantification of force components that differentiate 'expert' vs 'novice' surgeons, and an end-to-end platform to track surgical trainee progress
- Created neuroGPT-X, an AI chat-based app for physicians for vestibular schwannoma published in the Journal of Neurosurgery demonstrating subspecialty-level answers to user queries; media: Editorial. Who, or what, to believe by Michael J. Link, MD and Matthew L. Carlson, MD; Calgary Department of Clinical Neurosciences 2022-2023 Annual Report: The AI Will See You Shortly (pages 22-23)
- Created Eloquent Aid, an AI-powered app to assist identification of eloquent brain regions during awake craniotomies targeted for low- to middle-income countries; users complete image-based tasks by speaking, and the app determines whether the answer is correct in real time; intraoperative trials underway in the College of Medicine and Philippine General Hospital

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; media: CTV and UAlberta interviews
- Led the development of a voice-controlled exoskeleton; users complete tasks 54% faster than using a mobile app

Publications

Manuscripts (of 15)

1. **E. Guo**, M.B. Keough, A.M. Henderson, E. Hagen, M.A. Levine, T.G. Arnason, K. Au*, "Perioperative Management of Patients with Glioblastoma Co-Presenting with Pheochromocytoma," *Journal of Neurosurgery: Case Lessons* [accepted].
2. S. Arfaie*, M.S. Mashayekhi, M. Mofatteh, C. Ma, R. Ruan, M.A. MacLean, R. Far, J. Saini, I.E. Harmsen, T. Duda, A. Gomez, A.D. Rebchuk, A.P. Wang, N. Rasiah, **E. Guo**, A.M. Fazlollahi, E.R. Swan, P. Amin, S. Mohammed, J.D. Atkinson, R.F. Del Maestro, F. Girgis, A. Kumar, S. Das, "ChatGPT and neurosurgical education: A crossroads of innovation and opportunity," *Journal of Clinical Neuroscience*, Sep. 4, 2024, doi: 10.1016/j.jocn.2024.110815.
3. **E. Guo***, R. Ramchandani, Y. Park, M. Gupta, "OSCEai: Personalized Interactive Learning for Undergraduate Medical Education," *Canadian Medical Education Journal*, Aug 6, 2024, doi: 10.36834/cmej.79220.
4. **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*, May 2024, pp. 1-6, doi: 10.1109/ICHMS59971.2024.10555587.

5. **E. Guo**, M. Gupta, H. Rossong, L. Boone, B. Manoranjan, S. Ahmed, I. Stukalin, S. Lama, G. Sutherland*, "Healthcare Spending vs Mortality in CNS Cancer: Has Anything Changed?" *Neuro-Oncology Practice*, Apr. 2024, 11(5):566-574, doi: 10.1093/nop/npae039.
6. 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*, 7(12):CASE2454, Mar. 2024, doi: 10.3171/CASE2454.
7. Y. Park, A. Pillai, J. Deng, **E. Guo**, M. Gupta, M. Paget, 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*, Mar. 2024, doi: 10.1186/s12911-024-02459-6.
8. **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, 26:e48996, doi: 10.2196/48996.
9. **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, 140(4):1041-1053, doi: 10.3171/2023.7.JNS23573.
10. 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.
11. 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.
12. S. Becker, D. Clark*, M. Gupta, S. Kannappan, B. Wong, E. Hernandez-Zavaleta, **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.

Invited Talks

1. **E. Guo**, "OSCEai: Generative AI for Interactive Medical Education," *Alberta Innovates Student Innovator Session*, AB, Canada, Jul. 11, 2024.
2. A. Burrell, E. Dempsey, **E. Guo**, "The Role of Artificial Intelligence in Geriatric Medicine Education," *Canadian Geriatrics Society Annual Scientific Meeting*, Calgary, AB, Canada, Apr. 26, 2024.
3. **E. Guo**, "IEEE Humangineering Series: Changing the Medical Landscape with LLMs," *IEEE Sight, Schulich School of Engineering, University of Calgary*, Calgary, AB, Canada, Jan. 11, 2024.

Selected Poster Presentations (of 21)

1. **E. Guo**, L. Boone, H. Shakil, R. Sanguinetti, M. Gupta, S. Lama, G. Sutherland*, "Chordoma management with artificial intelligence: a scoping review of current applications and future prospects," *CNSF 2024*, Toronto, ON, Canada, May 20-25, 2024, doi: 10.1017/cjn.2024.186.
2. R. Ramchandani, S.G. Biglou, M. Gupta, **E. Guo***, "Using AI to revolutionize clinical training through OSCE-GPT: a focused exploration of user feedback on otolaryngology and neurology cases," *CNSF 2024*, Toronto, ON, Canada, May 20-25, 2024, doi: 10.1017/cjn.2024.176.
3. **E. Guo**, J. S.G. Pascual, S. K.N. Cua, K. J.O. Khu, S. Lama, G. Sutherland*, "Automated awake brain mapping with eloquentaid: a novel tool for low-resource settings," *CNSF 2024*, Toronto, ON, Canada, May 20-25, 2024, doi: 10.1017/cjn.2024.236.
4. I. Ma*, **E. Guo**, M. Gupta, O. Chen, M. Vergouwen, B. Chiang, M. Paget, C. Naugler, A. Harvey, "Using large language models to automate literature screening in undergraduate medical program evaluation," *International Congress on Academic Medicine 2024*, Vancouver, BC, Canada, Apr. 12-15, 2024.
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: Advancing Responsible Large Language Models for Clinical Use," *CNS 2023*, Washington, DC, USA, Sep. 9-13, 2023.
6. **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.
7. **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.
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.

Selected Grants (of 19)

Innovation in Surgical Education Grant Mar 2024
- Awarded by the Department of Surgery and Office of Surgical Education in Calgary for the development of OSCEai, an AI-powered medical communications app used in Canadian medical schools

Students Union Quality Money Grant Mar 2024
- Awarded $35,797 for the development of OSCEai

Microsoft for Startups Founders Hub Mar 2024
- Awarded for the development of OSCEai

Mach-Gaensslen Foundation: Summer Medical Student Research Award Feb 2024
- Awarded to create a large language model platform for the management of terminal brain cancers

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

NSERC Undergraduate Student Researcher Award Mar 2022
- Awarded for research to develop intelligent control algorithms for a lower limb exoskeleton

Selected Scholarships and Awards (of 22)

Dutkevich Memorial Trust Award for Medical Students Jun 2024
- Offered to MD students who excelled in clerkship electives in Pathology, Medical Microbiology, or Neuropathology

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

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

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
- Achieved USA Fencing A16 ranking (highest ranking in USA Fencing)
- 23rd Place Guatemala Junior (U20) World Cup; represented Team Canada

Table Tennis 2007 – 2012
- Medalled in every competition (50+ national and local events) in under 11 and 13 singles, doubles, and team events
- Youngest athlete at the Halifax Canada Winter Games; media coverage: CBC Sports and Toronto Star

Skills and Hobbies

Certifications	ACLS, BLS, Standard First Aid CPR & AED Level C, Diplôme d'études en langue française niveau B1
Skills	Machine learning, reinforcement learning, software engineering, medical education

Software	Python, R, C++, MATLAB, LaTeX, HTML, CSS, JavaScript, Node.JS, Simulink, Git
Professional Societies	Congress of Neurological Surgeons, Institute of Electrical and Electronics Engineers (IEEE)
Hobbies & Interests	Billiards, programming, running, fencing, table tennis, soccer, reading