Sujay Nagaraj

Internal Medicine Resident (PGY1), University of Toronto

s.nagaraj@mail.utoronto.ca | www.sujaynagaraj.com

Education

University of Toronto – Temerty Faculty of Medicine *Toronto, ON*
Doctor of Medicine (MD) *2026*
- MD-PhD Student: completed pre-clerkship studies 2018-2020, returned to clerkship in 2024

University of Toronto – Dept. of Computer Science *Toronto, ON*
Doctor of Philosophy (PhD), Computer Science *2025*
- Advisor: Anna Goldenberg, PhD. GPA 4.0/4.0. Convocated in October 2025
- Thesis title: *"Reconciling with Noise in Machine Learning for Health"*

Queen's University *Kingston, ON*
Bachelor of Science (BSc Honours) *2018*
- Life Sciences major, Computer Science minor

Research Experience

University of Toronto - Dept. of Computer Science *Toronto, ON*
Supervisor: Anna Goldenberg, PhD *2019 - Present*
- Research area: machine learning, computer science, wearable devices in health
- PhD Thesis: "Reconciling with noise in machine learning for health"

University of California, San Diego - Dept. of Computer Science *San Diego, CA*
Supervisor: Berk Ustun, PhD *2023 - 2025*
- Research area: machine learning and computer science
- Empirical and theoretical characterization of individual-level uncertainty in machine learning classification with noisy labels - collaboration with Yang Liu (UCSC) and Flavio Calmon (Harvard)

SickKids Critical Care Unit *Toronto, ON*
Supervisor: Dr. Mjaye Mazwi *2019 - 2024*
- Research area: critical care medicine and machine learning
- Development and deployment of machine-learning models in the Critical Care Unit for predicting vascular catheter access and CLABSI risk awareness

BlueDot *Toronto, ON*
Supervisors: Dr. Kamran Khan and Dr. Isaac Bogoch *2018*
- Research area: technology company based in Toronto, infectious disease, and population health
- Completed a modeling risk assessment of the 2018 Mumps outbreak for the US CDC

University of Calgary *Calgary, AB*
Supervisor: Dr. Cheryl Barnabe *2015-2028*
- Research area: Inflammatory arthritis, health equity, and population health
- Understanding disparities in prevalence and outcomes of Inflammatory Arthritis in Indigenous communities.

Selected Publications

*For context, in machine learning research, "conferences" are full-length, peer-reviewed papers with competitive acceptance rates $< 10\%$

Nagaraj, S., Rabinowicz, R., Goodday, S., Brunga, L., Korenblum, C., Villani, A., Kim, R., Karlin, E., Greer, R.W., Balaci, H., Omran, M., Goldenberg, A., Malkin, D., Friend, S., 2026. Digital health tools embedded in a cancer genetics clinic: an observational study. **JMIR Formative Research**, 10, e74375.

Nagaraj, S., Gerych, W., Tonekaboni, S., Goldenberg, A., Ustun, B. and Hartvigsen, T., 2025. Learning from time series under temporal label noise. **International Conference on Learning Representations (ICLR).**

Nagaraj, S., Liu, Y., Calmon, F., Ustun, B., 2025. Regretful decisions under label noise. **International Conference on Learning Representations (ICLR).**

Nagaraj, S., Goodwin, A., Greer, R. W., Eytan, D., Goodfellow, S. D., Jayarajan, A., Goldenberg, A., Mazwi, M. L., 2024. Needles in needle stacks: meaningful clinical information buried in noisy waveform data. **Machine Learning for Healthcare (MLHC)**

Nagaraj, S., Goodday, S., Hartvigsen, T., Boch, A., Garg, K., Gowda, S., Foschini, L., Ghassemi, M., Friend, S. and Goldenberg, A., 2023. Dissecting the heterogeneity of "in the wild" stress from multimodal sensor data. **nPJ Digital Medicine**, 6(1), p.237.

Singh, D., **Nagaraj, S.**, Daniel, R., Flood, C., Kulik, D., Flook, R., Goldenberg, A., Brudno, M. and Stedman, I., 2023. The promises and challenges of clinical AI in community paediatric medicine. **Paediatrics & Child Health**, 28(4), pp.212-217.

Singh, D., **Nagaraj, S.**, Mashouri, P., Drysdale, E., Fischer, J., Goldenberg, A. and Brudno, M., 2022. Assessment of machine learning–based medical directives to expedite care in pediatric emergency medicine. **JAMA Network Open**, 5(3), pp.e222599-e222599.

Ehrmann, D.E., Gallant, S.N., **Nagaraj, S.**, Goodfellow, S.D., Eytan, D., Goldenberg, A. and Mazwi, M.L., 2022. Evaluating and reducing cognitive load should be a priority for machine learning in healthcare. **Nature Medicine**, 28(7), pp.1331-1333.

Nagaraj, S., Harish, V., McCoy, L.G., Morgado, F., Stedman, I., Lu, S., Drysdale, E., Brudno, M. and Singh, D., 2020. From clinic to computer and back again: practical considerations when designing and implementing machine learning solutions for pediatrics. **Current Treatment Options in Pediatrics**, 6, pp.336-349.

McCoy, L.G., **Nagaraj, S.**, Morgado, F., Harish, V., Das, S. and Celi, L.A., 2020. What do medical students actually need to know about artificial intelligence?. **nPJ Digital Medicine**, 3(1), p.86.

Nagaraj, S., Barnabe, C., Schieir, O., Pope, J., Bartlett, S.J., Boire, G., Keystone, E., Tin, D., Haraoui, B., Thorne, J.C., Bykerk, V.P., Hitchon, C., and Canadian Early Arthritis Cohort Study Investigators, 2018. Early rheumatoid arthritis presentation, treatment, and outcomes in aboriginal patients in Canada: a Canadian early arthritis cohort study analysis. **Arthritis Care & Research**, 70(8), pp.1245–1250.

Nagaraj, S., Kargard, M., Hemmelgarn, B., Fritzler, M.J., White, T., and Barnabe, C., 2018. Effectiveness of an outreach model of care for rheumatology specialty clinics to an on-reserve First Nations community. **International Journal of Indigenous Health**, 13(1), pp.157–167.

Nagaraj, S., Finzel, S., Stok, K.S., Barnabe, C., and the SPECTRA collaboration, 2016. High-resolution peripheral quantitative computed tomography imaging in the assessment of periarticular bone of metacarpophalangeal and wrist joints. **The Journal of Rheumatology**, 43(10), pp.1921–1934.

Awards, Fellowships, Grants

2022-2024	**Vanier Canada Graduate Scholarship**, Canadian Institutes of Health Research (CIHR), *Most prestigious graduate scholarship offered by Government of Canada for leadership and academic achievement. Ranked 7th of 178 national finalists after Departmental and University nomination.*	*$150,000*
2022	**Mr. Robert and Ms. Francine Ruggles Innovation Award**, University Toronto *Awarded to a top MD/PhD student who demonstrates innovation related to the use of devices, patient care, sustainability at the health system, or research.*	*$50,000*
2022	**CIHR Doctoral Award - *declined***, Canadian Institutes of Health Research (CIHR) *Tri-agency award recognizing research excellence and leadership potential in health sciences. Offered but declined upon receipt of the Vanier Canada Graduate Scholarship.*	*$90,000*
2021	**SickKids Restracomp PhD Award**, The Hospital for Sick Children *Competitive research scholarship supporting outstanding graduate trainees at The Hospital for Sick Children Research Institute. Awarded in recognition of academic excellence and research potential.*	*$35,000*

	Ontario Graduate Scholarship, Government of Ontario	
2021	*Prestigious merit-based award jointly funded by the Province of Ontario and the University of Toronto, recognizing academic excellence and research potential in graduate studies.*	*$15,000*
2019	**Best Oral Abstract**, Joint Pediatric Critical Care International Meeting, London, England	–
2018	**Best Abstract for Research by an Undergraduate Student**, Canadian Rheumatology Association Annual Meeting, Vancouver, Canada	*$100*
	R.R. Singleton Summer Studentship Award, McCaig Institute for Bone and Joint Health	
2017-2018	*Competitive award supporting summer research work at the McCaig Institute for Bone and Joint Health, University of Calgary.*	*$4,875*
	Alberta Innovates Health Solutions (AIHS) Summer Studentship, University of Calgary	
2015	*Competitive award supporting undergraduate students engaged in health and medical research under faculty supervision.*	*$3,000*
	Chancellor's Scholarship, Queen's University	
2014-2018	*Prestigious entrance award recognizing exceptional academic achievement, creativity, and leadership among high school nominees nationwide.*	*$36,000*

Selected Presentations

April 2024. Big Data Institute at Oxford University, Oxford, United Kingdom. *Dissecting the heterogeneity of in-the-wild stress*. Invited oral talk.

May 2022. Symposium on Artificial Intelligence for Learning Health Systems – Hamilton, Bermuda. *Improving quality of care in critically ill children by real-time detection of bedside interventions using physiological waveforms and deep learning.* Poster presentation

November 2019. Joint Paediatric Critical Care International Meeting – London, England. *A novel approach to machine learning-based automated vascular catheter access detection in a paediatric critical care setting.* Oral presentation, awarded best oral abstract.

February 2018. Canadian Rheumatology Association – Vancouver, Canada. *Effectiveness of the outreach model for rheumatology specialty clinics to on-reserve First Nations in Canada: system-Level and individual measures of performance and outcomes.* Oral presentation, awarded best undergraduate abstract.

November 2017. American College of Rheumatology – San Diego, USA. *Effectiveness of the Outreach Model for Rheumatology Specialty Clinics to On-Reserve First Nations in Canada: System-Level and Individual Measures of Performance and Outcomes*. Poster presentation.

February 2017. Canadian Rheumatology Association – Ottawa, Ontario. *Outcomes of Aboriginal Patients with Early Inflammatory Arthritis: A CATCH Study Analysis.* Poster presentation.

November 2016. American College of Rheumatology – Washington D.C., USA. *Early Inflammatory Arthritis Presentation, Management and Outcomes in Canadian Aboriginal Patients.* Poster presentation.

Extracurricular Activities

Leadership & Volunteering

2025-Present	**University of Toronto Department of Medicine**, Education Executive Committee – represented learner voices on the advisory board to the Vice Chair of Education and the Chair of Medicine. The committee works on the investment of resources and educational challenges.
2023-Present	**Time Series for Health Conference (Vienna, Austria)**, Conference Organizer – coordinated peer review and logistics for a conference featuring 45 accepted papers, 4 invited speakers from North America and Europe, and over 150 global attendees focused on time series modeling in healthcare. Presently organizing the second iteration of the conference in San Diego, USA (December 2025).

2022-2024	**Temerty Centre for AI Research, Education in Medicine (T-CAIREM)**, Executive Committee – helped direct the organization on education initiatives at the University of Toronto. Worked on the preparation and delivery of AI education modules for PGME programs in Toronto.
2023	**Machine Learning for Health (ML4H) Conference**, Organizing Committee – organized 250+ person conference in New Orleans, LA, USA, for the Machine Learning for Health community. Brought together scientists and clinicians from around the world to discuss ideas and build collaborations.
2022-2023	**Graduate Application Assistance Program (GAAP)**, Mentor – worked with underrepresented applicants to Computer Science graduate programs. Helped prepare applications, proofread letters of interest, and provided interview practice.
2023	**Calgary Youth Science Fair**, Volunteer Judge – served as a science fair judge for elementary and middle-school projects. I grew up participating in science fairs (competing at the national and international levels). This was a small way to give back to this community.
2022	**Techfugees**, Mentor – provided 1:1 mentoring, tutoring, language practice, and skill-building for Syrian Refugees in Lebanon.
2021	**COVID19 Vaccinations**, Volunteer – worked at various community and pop□up vaccination clinics in the Greater Toronto Area. Work included organizing vaccine drives, registering patients, collecting demographic information for outcome measures, and administering vaccines under clinical supervision.
2021	**Happi Tutor Program**, Tutor – volunteered as a virtual math tutor for a Syrian refugee Grade 3 student during the COVID-19 pandemic, provided weekly support to help bridge learning gaps exacerbated by school closures and limited access to supplementary education in lower-income families.
2019-2020	**Growing up Healthy**, Mentor – designed and facilitated monthly health/wellness workshops in a grade 5/6 class within the GTA. This work was done alongside 3 of my medical school colleagues at the time. Unfortunately, the work had to be cut short due to the COVID-19 pandemic.
2019-2020	**Community of Support**, Mentor – mentored a student from an underrepresented population in medicine by guiding them through the medical school application process. Helped review their personal statements and provided interview preparation.
2018-2020	**AI in Medicine Student Society**, Co-lead – led curricular advocacy efforts resulting in U of T becoming the first Canadian medical school to integrate AI into its official MD curriculum. Organized speaker series, workshops, and networking sessions to advance student engagement with AI in healthcare.
2019-2020	**Wilderness Medicine Society**, Co-lead – organized and led outdoor excursions and wilderness medicine training for medical students, fostering engagement with outdoor skills and medical education.
2016-2017	**Calgary Homelessness Awareness**, Co-founder – developed educational module on homelessness and social determinants of health for Alberta high schools. Pilot program demonstrated positive outcomes; scaled to four additional schools and handed over to Calgary Homeless Foundation for continued implementation.

Teaching Experience

Fall ’23	**CSC2541: Machine Learning for Health (Graduate)**, Head Teaching Assistant – interdisciplinary course offered through the Department of Computer Science, enrolled 100 students. Organized office hours, taught machine learning content, graded assignments, and helped students work through final applied projects.
Winter ’23	**CSC108: Introduction to Computer Programming (Undergraduate)**, Teaching Assistant – managed office hours for students seeking help with assignments and graded assignments.