

Sujay Nagaraj

MD/PHD STUDENT · DEPARTMENT OF COMPUTER SCIENCE

University of Toronto

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Education

University of Toronto

PHD COMPUTER SCIENCE

- Advisor: Dr. Anna Goldenberg

Toronto, Ontario, Canada

2020 - present

University of Toronto

DOCTOR OF MEDICINE (MD)

- Completed 2 out of 4 years - returning in 2024

Toronto, Ontario, Canada

2018 - present

Queen's University

BSc - HONOURS

- Life Sciences Major
- Computer Science Minor

Kingston, Ontario, Canada

2014 - 2018

Professional Experience

2023-
present

Visiting PhD Student, University of California - San Diego Advisor: Dr. Berk Ustun

2015-2018 **Undergraduate Researcher**, Dept. of Medicine, University of Calgary Advisor: Dr. Cheryl Barnabe

Publications

PUBLISHED - SELECTED

Nagaraj, S., Goodwin, A., Greer, R. W., Eytan, D., Goodfellow, S. D., Jayarajan, A., Goldenberg, A., Mazwi, M. L., 2024. Needles in Needle Stacks]Needles in 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.

IN REVIEW

Nagaraj, S., Gerych, W., Tonekaboni, S., Goldenberg, A., Ustun, B. and Hartvigsen, T., 2024. Learning from Time Series under Temporal Label Noise. arXiv preprint arXiv:2402.04398. Under Review NeurIPS 2024.

Nagaraj, S., Liu, Y., Calmon, F., Ustun, B., 2024. Regretful Decisions under Label Noise. Under Review NeurIPS 2024.

IN PREP

Nagaraj, S., Rabinowicz, R., Goodday, S., Brunga, L., Korenblum, C., Kim, R., Goldenberg, A., Malkin, D., Friend, S., 2024. A real-world Clinical Deployment of Digital Health Tools in Families with Cancer Predisposition. Under Submission to Nature Medicine.

Awards, Fellowships, & Grants

2022-2024	Vanier PhD Award , Canadian Institutes of Health Research (CIHR) <i>Nationally Ranked 7/178</i>	\$ 150,000
2022	Mr. Robert and Ms. Francine Ruggles Innovation Award , University Toronto	\$ 50,000
2022	CGS Doctoral Award - <i>declined</i> , Canadian Institutes of Health Research (CIHR)	\$ 90,000
2021	SickKids Restrcomp PhD Award , The Hospital for Sick Children	\$ 130,000
2021	Ontario Graduate Scholarship , Government of Ontario	\$ 15,000
2014-2018	Chancellor's Scholarship , Queen's University	\$ 36,000

Presentations

INVITED TALKS

Spring 2024. *Dissecting the Heterogeneity of in-the-wild Stress*. Invited talk: Big Data Institute - Oxford University, Oxford, United Kingdom.

CONTRIBUTED PRESENTATIONS

Nagaraj, S., Hartvigsen, T., Boch, A., Foschini, L., Ghassemi, M., Goodday, S., Friend, S., Goldenberg, A. Dissecting In-the-Wild Stress from Multimodal Sensor Data. *Learning from Time Series for Health Workshop, NeurIPS*. December, 2022.

Nagaraj, S., Goodwin, A., Greer, R. W., Eytan, D., Goodfellow, S. D., Jayarajan, A., Goldenberg, A., Mazwi, M. L. 2022. Improving quality of care in critically ill children by real-time detection of bedside interventions using physiological waveforms and deep learning. *Symposium on Artificial Intelligence for Learning Health Systems*. Abstract. Hamilton, Bermuda.

Nagaraj, S., Goodwin, A., Greer, R. W., Eytan, D., Goodfellow, S. D., Jayarajan, A., Goldenberg, A., Mazwi, M. L., 2019. A novel approach to machine learning-based automated vascular catheter access detection in a paediatric critical care setting. *Joint Paediatric Critical Care International Meeting* – Oral Presentation. London, England.

Teaching Experience

Fall 2023	CSC2541: Machine Learning for Health (Graduate) , Head Teaching Assistant	University of Toronto
Winter 2023	CSC108: Introduction to Computer Programming (Undergraduate) , Teaching Assistant	University of Toronto

Research Experience

University of California (San Diego) - Dept. of Computer Science

San Diego, CA (Remote)

SUPERVISOR: DR. BERK USTUN

Oct. 2023 - Present

- Empirical and theoretical characterization of individual-level uncertainty in classification under label noise - collaboration with Yang Liu (UCSC) and Flavio Calmon (Harvard).

University of Toronto - Dept. of Computer Science

Toronto, ON

ADVISOR: DR. ANNA GOLDENBERG

2019-present

- PhD Thesis: "Reconciling with noise in machine learning for health."

The Hospital for Sick Children (SickKids)

Toronto, ON

SUPERVISORS: DR. MJAYE MAZWI AND DR. SEBASTIAN GOODFELLOW

2019-present

- Development and deployment of machine-learning models in the Critical Care Unit.

Outreach & Professional Development

SERVICE AND OUTREACH

- 2023 **ML4H Conference**, Organizing Committee
- 2022-2023 **Community of Support**, Mentor for under-represented applicants to Computer Science
- 2023 **Calgary Youth Science Fair**, Volunteer Judge
- 2022 **Techfugees**, Mentor - 1:1 mentoring, tutoring, skill-building for Syrian Refugees
- 2019-2020 **Wilderness Medicine Society**, Co-Lead

DEVELOPMENT

Program Chair - Time Series for Health Workshop @ ICLR 2024: <https://timeseriesforhealth.github.io/>

PEER REVIEW

FACCT 2024 Program Committee

Time Series 4 Health @ NeurIPS 2022 Program Committee