

Willa Potosnak

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[Website](#)
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Education

Carnegie Mellon University (CMU), Robotics Institute

Aug. 2022 - Current

Ph.D. in Robotics

Advisor: Dr. Artur Dubrawski

Duquesne University, Rangos School of Health Sciences

May 2022

Summa Cum Laude

B.S., Biomedical Engineering with Minor in Mathematics

Research Experience

CMU, Robotics Institute, [Auton Lab](#)

Advisors: Dr. Artur [Dubrawski](#), Dr. James Kyle [Miller](#)

Research Intern (hired between RISS summers)

Aug. 2021-Aug. 2022

- Developed Machine Learning (ML) models that demonstrate improved risk predictions for multiple post-operative outcomes using preoperative and intraoperative data. Additionally, models developed using preoperative data from local institutions outperform the industry standard model.
- Co-developed the auton-survival code package with Chirag [Nagpal](#) and demonstrated the application of Propensity Adjusted Treatment Effects and Counterfactual Survival Estimation to provide insight into the effect of geographic region and confounding factors on breast cancer mortality rates.
- Conducted research on Federated Learning and Knowledge Distillation algorithms to improve ML models for institutional organizations with data privacy and communication bandwidth constraints.

Robotics Institute Summer Scholars ([RISS](#)) Program Researcher

Summer 2020 and 2021

- Improved the reliability of algorithmic rule learning using non-parametric ML algorithms. Rule learning was demonstrated to identify beneficial model transfer opportunities between healthcare sites.
- Developed an ML model that demonstrates the ability of intraoperative data to identify patients at higher risk of post-operative renal failure based on preoperative risk baselines.

Duquesne University Biomedical Engineering Department Lab

Advisor: Dr. Benjamin Goldschmidt

Assistive Technology Project Co-Lead

Jan. 2019-May 2019

- Designed and 3-D printed an assistive device to facilitate tasks for those with grip disabilities due to stroke or other hand injuries.
- Designed and printed an assistive device for a disabled faculty member to facilitate instruction with hand-held medical tools.

Other Lab Experience

The Citizen Science Lab

May 2019-Aug. 2019

Curriculum designer and instructor of STEM lessons and experiments for K-12 students.

Achievements

Nominated and accepted to the Undergraduate Consortium (UC) mentorship program at the Thirty-Sixth AAAI Conference on Artificial Intelligence (AI) (AAAI-22).

Student panelist for the 2021 Artificial Intelligence and Data Science Education Leadership meeting hosted by [CSforAll](#) and supported by the White House Office of Science and Technology Policy (OSTP) and the National Science Foundation (NSF).

Awarded one of the [2019 John G. Rangos Prizes](#) for Duquesne curriculum proposal that integrated 3-D printing with prosthetic and assistive technology device design for patients.

Skills

Languages/Software/Systems: Python, PyTorch, MATLAB, Linux, HTML, Git, LaTeX

3-D Printing: 3-D printer use and maintenance, Autodesk Fusion 360, Ultimaker Cura

Extracurriculars

Volunteer co-lead of a CMU Robotics Institute team developing the **RoboticsEd** website for the purpose of helping to make robotics and AI resources more accessible to educators and their students.

Piano (12 years of study); guitar (6 years of study)

Publications and Presentations

Conference Publications

- C1 Nagpal, C., **Potosnak, W.**, Dubrawski, A. (2022). auton-survival: an Open-Source Package for Regression, Counterfactual Estimation, Evaluation and Phenotyping with Censored Time-to-Event Data. *Proceedings of the 7th Machine Learning for Healthcare Conference, PMLR*, 182, 1-24.
[\[Paper\]](#) [\[Blog\]](#) [\[Code\]](#)
- C2 **Potosnak, W.**, Dufendach K. A., Kaczorowski, D., Miller, J. K., Dubrawski, A. (2022). Machine Learning Models with Intraoperative Features Improve Risk Predictions Following CABG [Oral Presentation]. *Society of Thoracic Surgeons Coronary Conference*.
[\[Abstract\]](#)
- C3 Dufendach, K. A., Nagpal, C., **Potosnak, W.**, Dubrawski, A., Kaczorowski, D., (2022). Novel Machine Learning Technique Defines Patients Who Benefit from Off-Pump CABG [Oral Presentation]. *Society of Thoracic Surgeons Coronary Conference*.
[\[Abstract\]](#)
- C4 **Potosnak, W.**, Caldas, S., Dufendach, K. A., Clermont, G., Miller, J. K., Dubrawski, A. (2022). Robust Rule Learning for Reliable and Interpretable Insight into Expertise Transfer Opportunities. in *Proceedings of the Thirty-Sixth AAAI Conference on Artificial Intelligence*.
[\[Paper\]](#)

- C5 **Potosnak, W.**, Caldas, S., Dufendach, K. A., Clermont, G., Miller, J. K., Dubrawski, A. (2021). Robust Interpretable Rule Learning to Identify Expertise Transfer Opportunities in Healthcare. *NeurIPS 2021 Workshop Bridging the Gap: from Machine Learning Research to Clinical Practice*.
[\[Workshop details\]](#)
- C6 **Potosnak, W.**, Dufendach, K. A., Wertz, A., Miller, J. K., Kilic, A., Dubrawski, A. (2021 January 29-31). Continuous Intraoperative Data Analysis Using Machine Learning Reveals Multiple Parameters to Predict Post-CABG Renal Failure [Conference presentation abstract]. *Society of Thoracic Surgeons (STS) 57th Annual Meeting*.
[\[Meeting details\]](#)
- C7 Rühling Cachay, S., Erickson, E., Bucker, A. F. C., Pokropek, E., **Potosnak, W.**, Osei, S., Lütjens, B. (2020). Graph Neural Networks for Improved El Nino Forecasting. *NeurIPS 2020 Workshop on Tackling Climate Change with Machine Learning*.
[\[Paper\]](#)