

Saad Hossain

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EDUCATION

Bachelor of Applied Science (BASc) in Biomedical Engineering
University of Waterloo — Specialization in **Medical Artificial Intelligence**

Sep. 2020 – Apr 2025
GPA: 93/100

EXPERIENCE

Machine Learning Research Intern
Kolena Inc.

Jan. 2024 – Aug. 2024
San Francisco, California, U.S.A

- Automated evaluation of Gen-AI by fine-tuning Vision-Language models to model human preference.
- Improved RAG Generator accuracy by 8% on finance data through improved PDF-parsing & LLM prompting.

Machine Learning Developer
Deep Breathe

Sep. 2022 – Aug. 2024
London, Ontario, Canada

- Developed AI based screening tool confirming with 96% certainty the presence of fluid in lung ultrasound scans.
- Achieved 80% IoU in segmenting effusions and consolidations in lung-ultrasound using TensorFlow.

Research Assistant
University of Waterloo — *VIP, Critical ML Labs*

Jan. 2022 – Present
Waterloo, Ontario, Canada

- Investigating Domain Adaptation methods in Image Classification, Pose Estimation and Semantic Segmentation.
- Outperformed Egocentric Pose Estimation State of the Art by 38% via Vision Transformers built in PyTorch.

Software Engineer
IntelliSports

Jan. 2022 – Apr. 2022
Montreal, Quebec, Canada

- Boosted game cheat-detection accuracy by 30% by feature engineering IMU data with Sklearn & SciPy.
- Identified onboarding flow with +50% user retention by conducting decision-tree & SVM analysis on user data.

Robotics Research Intern
University of Waterloo — *HCRMI, SIRRL Labs*

May. 2021 – Dec. 2021
Waterloo, Ontario, Canada

- Deployed facial identity & emotion recognition pipeline on the Reem-C robot showcased in Robotics conferences.
- Researched feature extraction for IMU signals to perform activity recognition for Human-Robot Interaction.

PUBLICATIONS

- [1] C. Liu, **S. Hossain**, C. Thomas, K. Lai, R. Vemulapalli, S. Rambhatla, A. Wong. LangDA: Language-guided Domain Adaptive Semantic Segmentation. *Advances in Neural Information Processing Systems (NeurIPS) Workshop on Adaptive Foundation Models*, 2024. [\[Link\]](#)
- [2] J. Park, K. Kaai, **S. Hossain**, N. Sumi, S. Rambhatla, P. Fieguth. Domain-Guided Spatio-Temporal Self-Attention for Egocentric 3D Pose Estimation. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2023. [\[Link\]](#) [\[GitHub\]](#)
- [3] K. Kaai, **S. Hossain**, S. Rambhatla. Are all classes created equal? Domain Generalization for Domain-Linked Classes. *Advances in Neural Information Processing Systems (NeurIPS) Workshop on Distribution Shifts: New Frontiers with Foundation Models*, 2023. [\[Link\]](#) [\[GitHub\]](#)
- [4] J. Park, F. Barnard, **S. Hossain**, S. Rambhatla. Implicit Stylization for Domain Adaptation. *International Conference on Learning Representations (ICLR) Domain Generalization Workshop: What do we need for successful domain generalization?*, 2023. [\[Link\]](#)
- [5] J. Park, K. Kaai, **S. Hossain**, N. Sumi, S. Rambhatla, P. Fieguth. Building Spatio-temporal Transformers for Egocentric 3D Pose Estimation. *Joint International Workshop on Egocentric Perception, Interaction and Computing (EPIC) and Ego4D, IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR)*, 2022. [\[Link\]](#)

- [6] C. Liu, B. Balaji, **S. Hossain**, C. Thomas, K. Lai, R. Vemulapalli, S. Rambhatla, A. Wong. Building Context-Awareness via Language for Domain Adaptive Semantic Segmentation. *Manuscript Under Review*, 2024.
- [7] K. Kaai, **S. Hossain**, S. Rambhatla. Domain Generalization For Domain-Linked Classes. *Manuscript Under Review*, 2024.
- [8] R. Chaudhary, J. Ho, D. Smith, **S. Hossain**, J. Hargun, B. VanBerlo, C. Dave, J. Deglint, A. Durvasula, A. Ford, B. Li, N. Murphy, R. Prager, M. Rahman, K. Rikhranj, J. Tschirhart, B. VanBerlo, C. Vannelli, B. Wu, D. Wu, R. Arntfield. Development of a Clinically Tailored Automated Pleural Effusion Classifier (Pleff-Net) using convolutional neural networks. *Manuscript Under Review*, 2024.

THESIS AND CAPSTONES

- PneumoGuide: Leveraging Augmented Reality to Guide Ultrasound Sonography for Detecting Lung Conditions. *Final Year Design Project*, 2025.

WEBINARS AND BLOGS

- Enhancing AI Testing : The Power of Metadata Hydration. Live Webinar Hosted by Kolena, Inc. *Invited as Key Speaker*, 2024. [\[Link\]](#)
- Mastering RAG Systems for LLMs: From Pitfalls to Performance. Live Webinar Hosted by Kolena, Inc. *Invited as Panelist*, 2024. [\[Link\]](#)
- Crash Workshop on Physiological Computing, Univeristy of Waterloo. *Presenter on Inertial Measurement Unit (IMU) Feature Extraction*, 2022. [\[Link\]](#)

SOFTWARE TOOLKITS

- HRI Physiolib: A software framework to support the integration of physiological adaptation in Human Robot Interaction. *Contributed to IMU Signal Processing Tools*, 2022. [\[Link\]](#) [\[GitHub\]](#)

HONOURS AND AWARDS

Honours and Awards

- CRA Outstanding Undergraduate Researcher Award - *Honorable Mention*
- Best Paper Award *Conference on Vision and Imaging Systems 2024*
- Yuen Family Foundation Award for Final Year Design Project *\$10,000*
- President's Research Award *\$1,500*
- Engineering International Student Scholarship *\$10,000*
- President's Scholarship of Distinction *\$2,000*
- Term Dean's Honour List. Fall '2023 & Winter '2023 & Fall '2021 & Fall '2020
- Top AS Level Exam Scorer in Country *Cambridge International Examinations 2019*

Performance Evaluations

- Kolena Inc. - Outstanding Performance, Winter '2024 & Spring '2024
- Deep Breathe - Outstanding Performance, Fall '2022 & Spring '2023
- IntelliSports - Outstanding Performance, Winter '2022
- University of Waterloo (HCRMI Lab) - Outstanding Performance, Spring '2021

TECHNICAL SKILLS

Languages: Python, C++, C#, MySQL, PostgreSQL, PHP, HTML

Tools and Technologies: PyTorch, TensorFlow, Sklearn, Git, OpenCV, ROS, EC2, Linux, Shell, AWS, Azure, Pandas

Interests: Travelling, Basketball, Calisthenics, Robotics, Computer Vision, LLMs, Generative AI, Languages (Spoken)