

Hasib Zunair

Ph.D Candidate in Computer Vision (Expected December 2024)

Email: hasibzunair@gmail.com Phone: (514) 893-4048 Location: Toronto, Canada

Website LinkedIn Google Scholar GitHub

EDUCATION

- **Concordia University** Montreal, Canada
Ph.D and MAsc in Computer Vision, Machine Learning & Artificial Intelligence Sept. 2019 – Dec. 2024
- **North South University** Dhaka, Bangladesh
B.Sc. in Electrical & Electronic Engineering May 2013 – Dec. 2017

WORK EXPERIENCE

Decathlon Montreal, Canada
Applied Machine Learning Scientist Sept. 2022 – June 2024

- Developed machine learning (ML) algorithms for **stat-tracking basketball game videos** on **edge compute** in real-time using model quantization, elevating playing experience and driving higher user engagement.
- Created a **data annotation workflow**, **accelerating model development**, saving $7\times$ time and reducing costs.
- Built **object detector** to identify bike brands from marathon images to improve identifying penetration rate.
- Deployed **cloud-based ML APIs** in production to serve scalable computer vision models, optimized for efficiency.
- Mentored an intern in developing a domain-specific **human pose estimation** model for bike posture analysis.
- **Tools:** Python, PyTorch, YOLOv6, YOLOv8 Pose, ONNX, CoreML, FastAPI, Docker, GCP services, Weaviate.

Research Scientist Intern Sept. 2020 – Aug. 2022

- Trained new **semi-supervised image classification algorithm** using large-scale unlabeled data, saving $6\times$ time, reducing $5\times$ cloud compute resources, boosting robustness compared to existing methods. Optimized method on **sport-or-not**, **yoga-pose** and **sport** recognition, improving predictive accuracy; published in MMSports'21.
- Developed **generative AI algorithm** and created a dataset using clothing products for **image-based virtual try-on**, preserving clothing texture, embroidery and handling complex person poses; published in BMVC'22.
- Led and **managed two research projects** from ideation and algorithm development to experimental design, aligned with industrial and business needs, resulting in publications.
- **Tools:** Python, TensorFlow, PyTorch, OpenCV, NumPy, Scikit-learn, LabelMe, Docker, Gradio, HF Spaces.

Concordia University Montreal, Canada
Machine Learning Researcher Sept. 2019 – Dec. 2024

- Designed accurate and efficient **deep learning** algorithms in 2D & 3D **computer vision** for image generation, recognition, segmentation etc., addressing complex real-world challenges. Tailored models like DINO, ViT, cGAN, 3D U-Net, YOLO, CLIP, SAM, VLMs and applied unsupervised, self-supervised, **zero-shot learning** paradigms.
- Led publications and presented work at top conferences and journals like **WACV**, **BMVC**, **ICIP** and **IEEE TMI**, and workshops at **CVPR**, **ICML** and **MICCAI**, showcasing novel findings in computer vision. (**900+ citations**)
- Collaborated with **product teams** in industry and external researchers to develop innovative ML solutions.
- Mentored **15 students from undergraduates to Ph.Ds** in guiding research and implementation of algorithms.
- **Tools:** Python, PyTorch, OpenCV, NumPy, Scikit-learn, Pillow, MCMC, Timm, Tensorboard, Weights & Biases.

Ericsson Montreal, Canada
Machine Learning Specialist Feb. 2024 – June 2024

- Assisted 11 individuals in building **time-series forecasting** models using proprietary historical data.
- Taught **machine learning concepts** including **Building Large Language Models (LLMs) using PyTorch**.
- Recommended approaches, tools and libraries for **streamlining project development** and deployment.

Machine Learning Specialist Oct. 2021 – Mar. 2022

- Assisted 10 individuals in **detecting anomalies** in historical time-series data using machine learning.
- Taught machine learning concepts, including **Building Machine Learning (ML) Models using TensorFlow**.
- Guided project implementation through code reviews to **ensure successful project completion**.

SKILLS

- **Programming Languages:** Python, Bash (Shell Scripting).
- **Libraries:** PyTorch, TensorFlow, OpenCV, NumPy, Scikit-learn, ONNX, CoreML, Weaviate, Weights & Biases, Pytest.
- **Cloud Infrastructure and MLOps:** Google Cloud Platform, FastAPI, Docker, Gradio, GitHub Actions, Kubernetes.

OPEN-SOURCE CONTRIBUTIONS

- [kornia/kornia](#) (GitHub Stars: >9500), Added a core feature implementation of MS-SSIM + L1 loss function.
- [keras-team/keras](#) (GitHub Stars: >61000), Wrote tutorial code for 3D image classification from CT scans.
- [meituan/YOLOv6](#) (GitHub Stars: >5600), Fixed export of object detection models to ONNX format.

SELECTED PUBLICATIONS

Full list of publications available on [Google Scholar](#).

- **PEEKABOO: Hiding Parts of an Image for Unsupervised Object Localization.** [Hasib Zunair](#), A. Ben Hamza. In *BMVC*, 2024.
- **Learning to Recognize Occluded and Small Objects with Partial Inputs.** [Hasib Zunair](#), A. Ben Hamza. In *WACV*, 2024.
- **Masked Supervised Learning for Semantic Segmentation.** [Hasib Zunair](#), A. Ben Hamza. In *BMVC*, 2022 (**Oral Presentation, Top 5%**).
- **Sharp U-Net: Depthwise Convolutional Network for Biomedical Image Segmentation.** [Hasib Zunair](#), A. Ben Hamza. In *Computers in Biology and Medicine*, 2021 (**Impact Factor: 7.7**).
- **A Multi-organ Nuclei Segmentation and Classification Challenge.** Ruchika Verma, Neeraj Kumar, [Hasib Zunair](#), A. Ben Hamza. In *IEEE Transactions on Medical Imaging*, 2021 (**Impact Factor: 10.6**).

MACHINE LEARNING COMPETITIONS

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| • Product Counting for Retail, AI City Challenge, CVPR Workshop - 3rd Place (Paper , Code , Leaderboard) | 2022 |
| • Tuberculosis Type Classification from 3D CT Scans, ImageCLEF - 2nd Place (Paper , Code , Leaderboard) | 2021 |
| • Nuclei Segmentation from Whole Slide Images, MoNuSAC - 11th Place (Paper , Code , Leaderboard) | 2020 |
| • Tuberculosis Prediction, ImageCLEF - 5th Place (Paper , Code , Leaderboard) | 2019 |
| • Bengali Digit Recognition, bengali.ai - 6th Place (Paper , Code , Leaderboard) | 2018 |

MENTORING & SUPERVISION

- Mominul Islam. **CosSIF**. In *Computers in Biology and Medicine*, 2024 (**Impact Factor: 7.7**).
- Deponker Sarker Depto, Md. Mashfiq Rizvee. **Leukemia detection**. In *Computers in Biology and Medicine*, 2022.
- Md Shakib Khan, Kazi Nabiul Alam, Abdur Rab Dhruba. **Knowledge Distillation in Melanoma Detection**. In *Computers in Biology and Medicine*, 2022.
- Deponker Sarker Depto, Shazidur Rahman, Md. Mekayel Hosen, Mst Shapna Akter, Tamanna Rahman Reme. **Blood Cell Segmentation**. In *Tissue and Cell*, 2021.
- Tamanna Rahman Reme. **Malaria Classification**. In *Tissue and Cell*, 2021.

CERTIFICATIONS & TRAINING

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|---|------|
| • Agile Crash Course: Agile Project Management; Agile Delivery. | 2024 |
| • Google Cloud Machine Learning - Vertex AI. | 2023 |
| • Effective MLOps - Model Development. | 2023 |
| • Terraform for Beginners using GCP - Google Cloud (Hands-on). | 2023 |
| • Kubernetes for the Absolute Beginners - Hands On. | 2023 |
| • Docker for the Absolute Beginner - Hands On - DevOps. | 2023 |
| • Deep Learning + Reinforcement Learning Summer School. | 2021 |

AWARDS & SCHOLARSHIPS

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| • Concordia University Graduate Doctoral Fellowship and International Tuition Award of Excellence for Ph.D. | 2021 |
| • MITACS Accelerate Fellowship for two years for MASc. | 2020 |
| • Concordia Merit Entrance Scholarship for Ph.D and MASc. | 2021, 2019 |

ACADEMIC SERVICES

- **Reviewer:** WACV'24, BMVC'22, 3DV'22-'24, Pattern Recognition Letters'22, Physics in Medicine and Biology'21-'22.
- **Lab Demonstrator:** COMP6771 - Image Processing, Winter'21 and Winter'22; COMP333 - Intro to Data Analytics, Fall'21 at Concordia University. Taught image processing and data analysis concepts and implementations using Python, OpenCV, NumPy, Scikit-learn, Pandas, Matplotlib to graduate level courses of 80 students and guided course projects.

MEDIA COVERAGE

- "One of our students did something crazy with transfer learning.", Jeremy Howard, fast.ai.
- "Semi-supervised visual learning using large-scale sport image data.", Concordia University.
- "A multi-year training program for AI professional development at Ericsson.", Concordia University.