

Hasib Zunair

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| CONTACT INFORMATION | Montreal, Canada 904 Boul. Henri-Bourassa East, Apt 104 Phone: +15148934048 | Email: hasibzunair@gmail.com Website: hasibzunair.github.io Professional: LinkedIn , GitHub |
| SKILLS | <ul style="list-style-type: none">• Research Expertise: Computer Vision, Machine Learning, Image Recognition & Generation, Segmentation, Video Analysis, Object Detection, Visual Search, Technical Writing.• Programming Languages: Python, Bash (Shell Scripting), Git, C++, Matlab.• Libraries & Programs: NumPy, PyTorch, TensorFlow, Keras, OpenCV, imgaug, Scikit-learn, ONNX, CoreML, TensorBoard, Autodistill, LabelMe, Weights & Biases, Pytest.• Cloud Infrastructure & Deployment (CI/CD): Google Cloud Platform, Vertex AI, Docker, Flask, FastAPI, GitHub Actions, Gradio, Linux OS.• Team Management: Led research teams from ideation, to development, to publication.• Product Management: Led end-to-end development of novel algorithms from problem framing, to planning, to design of the experiments according to industrial and business needs. | |
| EDUCATION | Ph.D. in Information Systems Engineering <i>Concordia University, Montreal, QC, Canada</i> Thesis: Masked Supervised Models for Visual Learning Advisor: Prof. Abdessamad Ben Hamza | Sep 2021 - Dec 2024 |
| | MAS.c in Quality Systems Engineering <i>Concordia University, Montreal, QC, Canada</i> Thesis: Designing Efficient Deep Learning Models for Medical Diagnosis Advisor: Prof. Abdessamad Ben Hamza | Sep 2019 - Aug 2021 |
| | B.Sc. in Electrical and Electronic Engineering <i>North South University (NSU), Dhaka, Bangladesh</i> Capstone: Design and Implementation of an Automated Attendance System | May 2013 - Dec 2017 |
| INDUSTRY EXPERIENCE | Applied ML Scientist (Part-time) - <i>Decathlon, Montreal, Canada</i> Developing machine learning and computer vision algorithms for sports use-cases and support the deployment on the cloud infrastructure and edge devices. | Sept 2022 - Present |
| | ML Specialist (5 months) - <i>Ericsson, Montreal, Canada</i> Assisted three teams to build time-series forecasting models using proprietary historical data using machine learning. Also, delivered relevant ML tutorials and support project implementations. | Feb 2024 - Jun 2024 |
| | Research Scientist Intern (12 months) - <i>Decathlon, Montreal, Canada</i> Created image-based virtual try-on dataset using Decathlon products and developed FIFA to handle complex person poses while retaining the texture and embroidery of clothing items. | Sept 2021 - Aug 2022 |
| | Research Scientist Intern (12 months) - <i>Decathlon, Montreal, Canada</i> Researched approaches for semi-supervised image classification and developed STAR to improve Decathlon's existing computer vision models by leveraging large-scale unlabeled image data. | Sept 2020 - Aug 2021 |
| | ML Specialist (6 months) - <i>Ericsson, Montreal, Canada</i> Assisted two teams in detecting anomalies in proprietary historical time-series data using machine learning. Developed and delivered ML tutorials and support project implementations. | Oct 2021 - Mar 2022 |

ML Engineer (4 months) - *Think Bricks LLC, Dhaka, Bangladesh* Apr 2019 - Aug 2019
Led and collaborated with a team of two interns and developed a deep learning model that improved diabetic retinopathy detection accuracy by 8% from fundus images, aiding doctors in diagnosis.

SELECTED
PUBLICATIONS

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

- P.1 **RSUD20K: A Dataset for Road Scene Understanding In Autonomous Driving.** [Hasib Zunair](#), Shakib Khan, A. Ben Hamza. In **ICIP**, 2024.
- P.2 **Learning to Recognize Occluded and Small Objects with Partial Inputs.** [Hasib Zunair](#), A. Ben Hamza. In **WACV**, 2024.
- P.3 **Masked Supervised Learning for Semantic Segmentation.** [Hasib Zunair](#), A. Ben Hamza. In **BMVC**, 2022 (Oral Presentation).
- P.4 **Fill in Fabrics: Body-aware Self-supervised Inpainting for Image-based Virtual Try-on.** [Hasib Zunair](#), Yan Gobeil, Samuel Mercier, A. Ben Hamza. In **BMVC**, 2022.
- P.5 **VISTA: Vision Transformer Enhanced by U-Net and Image Colorfulness Frame Filtration for Automatic Retail Checkout.** Md Shihab Istiak Hossain, Nazia Tasnim, [Hasib Zunair](#), Labiba Kaniy Rupty, Nabeel Mohammed. In **CVPR Workshop**, 2022.
- P.6 **Synthetic COVID-19 Chest X-ray Dataset for Computational Analysis.** [Hasib Zunair](#), A. Ben Hamza. In **ICML Workshop**, 2021.
- P.7 **Sharp U-Net: Depthwise Convolutional Network for Biomedical Image Segmentation.** [Hasib Zunair](#), A. Ben Hamza. In **Computers in Biology and Medicine**, 2021.
- P.8 **STAR: Noisy Semi-Supervised Transfer Learning for Visual Classification.** [Hasib Zunair](#), Yan Gobeil, Samuel Mercier, and A. Ben Hamza. In **ACM Workshop**, 2021.
- P.9 **MoNuSAC2020: A Multi-organ Nuclei Segmentation and Classification Challenge.** Ruchika Verma, Neeraj Kumar, [Hasib Zunair](#), A. Ben Hamza et al.. In **IEEE Transactions on Medical Imaging**, 2021.
- P.10 **Uniformizing Techniques to Process CT scans with 3D CNNs for Tuberculosis Prediction.** [Hasib Zunair](#), Aimon Rahman, Nabeel Mohammed, and Joseph Paul Cohen. In **MICCAI Workshop**, 2020.

SOFTWARE
PROJECTS

All of my projects details are available on my [website](#) and the code on [github](#).

[Machine Learning Competitions]

- Product Counting and Recognition for Retail Checkout, AI City Challenge, CVPR Workshop, 2022 - **3rd Place** ([Paper](#), [Code](#), [Leaderboard](#))
- Tuberculosis Type Classification, ImageCLEF, 2021 - **2nd Place** ([Paper](#), [Code](#), [Leaderboard](#))
- Nuclei Segmentation, MoNuSAC, 2020 - **11th Place** ([Paper](#), [Code](#), [Leaderboard](#))
- Tuberculosis Prediction, ImageCLEF, 2019 - **5th Place** ([Paper](#), [Code](#), [Leaderboard](#))
- Bengali Digit Recognition, bengali.ai, 2018 - **6th Place** ([Paper](#), [Code](#), [Leaderboard](#))

[Datasets]

- Bangladesh Road Scene Understanding Dataset for Autonomous Driving, 2024 - ([Link](#))
- Public Synthetic Dataset of COVID-19 Chest X-rays, 2021 - ([Link](#))

[Other Projects]

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| | <ul style="list-style-type: none"> • Monocular-to-3D Virtual Try-On, 2021 - (Webpage, Report, Video, Slides, Code) • Low to High Resolution Knee MRI Reconstruction, 2019 - (Code) • Deep Learning based Thyroid Nodule Segmentation from Ultrasound Images, 2020 - (Code) | |
| OPEN-SOURCE CONTRIBUTIONS | <p>meituan/YOLOv6 (GitHub Stars: >5600), Fix export of YOLO models to ONNX format.</p> <p>kornia/kornia (GitHub Stars: >9500), Add MS-SSIMLoss reconstruction loss function as a feature.</p> <p>keras-team/keras (GitHub Stars: >61000), Wrote tutorial code for 3D image classification.</p> | |
| AWARDS & SCHOLARSHIPS | <p>Concordia University Graduate Doctoral Fellowship for Ph.D 2021</p> <p>Concordia Internation Tuition Award of Excellence for Ph.D 2021</p> <p>Concordia Merit Entrance Scholarship for Ph.D 2021</p> <p>Two-year MITACS Accelerate Fellowship for MASc. 2020</p> <p>Concordia Merit Entrance Scholarship for MASc. 2019</p> <p>Best Student Paper Award, ICSSA, Kuching, Malaysia 2018</p> <p>Winner (First Prize), IEEE SS12 Maker Fair, Hyderabad, India 2017</p> | |
| INVITED TALKS & TUTORIALS | <p>Leveraging Vector Databases with Embeddings for Fast Image Search and Retrieval (Link) 2024</p> <p>Building and Applying Generative Models using PyTorch, Ericsson Canada (Link) 2024</p> <p>Build and Deploy Custom Docker Images for Object Recognition (Link) 2023</p> <p>Deep Learning in Computer Vision with PyTorch, NSU (Link) 2023</p> <p>Intro to Deep Learning with NumPy, NSU (Link) 2022</p> <p>Building ML models with TensorFlow, Ericsson Canada (Link) 2021</p> <p>How to get started with building Computer Vision systems, NSU (Link) 2021</p> <p>3D image classification from CT scans, Keras, TensorFlow (Link) 2020</p> <p>Programming with Python, NSU (Link) 2019</p> <p>Intro to Deep Learning for Image Classification using Python, NSU (Link) 2019</p> <p>Basics of Image Processing and Computer Vision, NSU (Link) 2018</p> <p>Intro to Robotics (ROBO101), a semester-long series of workshops, NSU 2018</p> | |
| CERTIFICATIONS & TRAINING | <p>Udemy - “Agile Crash Course: Agile Project Management; Agile Delivery” (Link) 2024</p> <p>Udemy - “GitHub Actions - The Complete Guide” (Link) 2023</p> <p>Udemy - “Terraform for Beginners using GCP - Google Cloud (Hands-on)” (Link) 2023</p> <p>Udemy - “Google Cloud Machine Learning - Vertex AI” (Link) 2023</p> <p>W&B - “Effective MLOps - Model Development” (Link) 2023</p> <p>Udemy - “Google Cloud Platform (GCP) Fundamentals for Beginners” (Link) 2023</p> <p>Udemy - “Kubernetes for the Absolute Beginners - Hands On” (Link) 2023</p> <p>Udemy - “Docker for the Absolute Beginner - Hands On - DevOps” (Link) 2023</p> <p>CIFAR - “Deep Learning + Reinforcement Learning Summer School” (Link) 2021</p> <p>Coursera - “Deep Learning Specialization” (Link) 2019</p> <p>Coursera - “Introduction to TensorFlow for AI, ML, DL” (Link) 2019</p> <p>Coursera - “Convolutional Neural Networks in TensorFlow” (Link) 2019</p> <p>Coursera - “IBM Machine Learning with Python” (Link) 2019</p> | |
| ACADEMIC SERVICES | <p>Reviewer: Winter Conference on Applications of Computer Vision (WACV), 2024</p> <p>Reviewer: British Machine Vision Conference (BMVC), 2022, 2024</p> <p>Reviewer: International Conference on 3D Vision (3DV), 2022, 2023, 2024</p> | |

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| | Reviewer: Pattern Recognition Letters (PRL), 2022 | |
| | Reviewer: Physics in Medicine and Biology (PMB), 2021, 2022 | |
| TEACHING EXPERIENCE | Lab Demonstrator, COMP 6771: Image Processing, <i>Concordia University</i> | 2022 |
| | Lab Demonstrator, COMP 333: Intro to Data Analytics, <i>Concordia University</i> | 2021 |
| | Lab Demonstrator, COMP 6771: Image Processing, <i>Concordia University</i> | 2021 |
| SUPERVISION & MENTORING | <ul style="list-style-type: none"> • Mominul Islam, “CosSIF: Cosine similarity-based image filtering to overcome low inter-class variation in synthetic medical image datasets”, In <i>Computers in Biology and Medicine</i>, 2024. • Jingnan Cao, “Human Pose Estimation for Bike Posture Analysis”, In <i>Decathlon SportsLab, France</i>, 2023. • Khundker Mohammad Sarwar Khalid, Farhan Ishraq Omi, Mohammed Bashem, “Improving Masked Supervision for Semantic Segmentation”, 2023. • Kazi Ramisa Rifa, Khalid Bin Shafiq, “Bangladeshi Traditional Virtual Try-On with Deep Learning Techniques and Computer Vision”, 2023. • Rejuana Islam, Fairouz Rahman, Md. Khaled Zohani Tonmoy, Mahmud Khan, “Synthetic Data Generation for Imbalanced Medical Image Classification”, 2023. • Ifad Uz Zaman, Sudipta Bhatta, Sadia Jeesan Ayesha, “Improving Knowledge Distillation for Medical Image Classification”, 2022. • Deponker Sarker Depto, Md. Mashfiq Rizvee, “Quantifying imbalanced classification methods for leukemia detection”, In <i>Computers in Biology and Medicine</i>, 2022. • Md Shakib Khan, Kazi Nabiul Alam, Abdur Rab Dhruba, “Knowledge Distillation Approach Towards Melanoma Detection”, In <i>Computers in Biology and Medicine</i>, 2022. • Deponker Sarker Depto, Shazidur Rahman, Md. Mekayel Hosen, Mst Shapna Akter, Tamanna Rahman Reme, “Automatic Segmentation of Blood Cells”, In <i>Tissue and Cell</i>, 2021. • Tamanna Rahman Reme, “Analysis of Deep Learning Architectures on High Variation Malaria parasite Classification”, In <i>Tissue and Cell</i>, 2021 • Labib Chowdhury, “Robust deep speaker recognition: Learning latent representation with joint angular margin loss”, In <i>Applied Sciences</i>, 2020 | |
| COMMUNITY ACTIVITIES | Founding President , IEEE Robotics and Automation Society, North South University | 2017 |
| | Conducted technical workshops for undergraduate students on building mobile robots and led teams in organizing and participating in national and international robotics competitions. | |
| MEDIA COVERAGE | <p>“One of our students did something crazy with transfer learning.”, Jeremy Howard, fast.ai.</p> <p>“Semi-supervised visual learning using large-scale sport image data.”, Concordia University.</p> <p>“A multi-year training program for AI professional development at Ericsson.”, Concordia University.</p> | |