

# Hasib Zunair

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

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[Website](#)   [LinkedIn](#)   [Google Scholar](#)   [GitHub](#)

## WORK EXPERIENCE

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### 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× 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× time, reducing 5× 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 state-of-the-art **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**.

## EDUCATION

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### Concordia University

Montreal, Canada

*Ph.D and MAsC in Computer Vision, Machine Learning & Artificial Intelligence*

*Sep. 2019 – Dec. 2024*

### North South University

Dhaka, Bangladesh

*B.Sc. in Electrical & Electronic Engineering*

*May 2013 – Dec. 2017*

## SKILLS

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- 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

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- [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

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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 - <b>3rd Place</b> ( <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Leaderboard</a> ) | 2022 |
| • Tuberculosis Type Classification from 3D CT Scans, ImageCLEF - <b>2nd Place</b> ( <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Leaderboard</a> )  | 2021 |
| • Nuclei Segmentation from Whole Slide Images, MoNuSAC - 11th Place ( <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Leaderboard</a> )                | 2020 |
| • Tuberculosis Prediction, ImageCLEF - 5th Place ( <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Leaderboard</a> )                                   | 2019 |
| • Bengali Digit Recognition, bengali.ai - 6th Place ( <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Leaderboard</a> )                                | 2018 |

## MENTORING & SUPERVISION

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- 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

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- **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

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- "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.