

Bhavya Sehgal

 bsehgal17 |  bhavya-sehgal |  Portfolio |  bsehgal1@ualberta.ca |  +1 825-333-4001

Professional Summary

PhD student in Computing Science at the University of Alberta specializing in Computer Vision and Machine Learning. Research interests include human pose estimation, biomedical image analysis, and deep learning for healthcare applications. Experienced in developing and validating computer vision methodologies for clinical, agricultural, and industrial applications through interdisciplinary research collaborations.

Research Interests: Computer Vision, Human Pose Estimation, Human Motion Analysis, Biomedical Image Analysis, Machine Learning for Healthcare, Deep Learning

Education

PhD – Computing Science | [University of Alberta](#) *Sep 2024 – Present*
Focus: Computer Vision & Machine Learning

Master of Science – Computing Science (Multimedia) | [University of Alberta](#) *Sep 2022 – Dec 2023*
CGPA: 3.7 / 4.0

Bachelor of Technology – Computer Science & Engineering | [Guru Nanak Dev University](#) *Jul 2018 – Jul 2022*
CGPA: 8.83 / 10

Publications

Joint-Adaptive Temporal Filtering for Robust Pose-Based Human Motion Analysis [[Accepted](#)]

B. Sehgal, I. Cheng

IEEE Engineering in Medicine and Biology Conference (EMBC), 2026

Comparing Pose Estimation Models for Lower-Body Joints [[Accepted](#)]

B. Sehgal, T. Truong, I. Cheng

IEEE International Conference on Smart Multimedia (ICSM), 2025

Pattern Recognition in Apple Orchards During Dormancy and Bud Development [[Published](#)]

B. Sehgal, R. Gandhi, I. Cheng

International Conference on Smart Multimedia (ICSM), Springer Nature Switzerland, pp. 3–16, 2024

Research Experience

Computer Vision Research Engineer | [Okaki](#) *May 2024 – Present*
Calgary, AB (Hybrid)

- Developed and validated pose-based computer vision methodologies for quantitative gait and balance assessment from clinical video recordings.
- Validated assessment outputs against gold-standard motion analysis equipment, demonstrating strong reliability across diverse patient populations.
- Conducted comparative benchmarking of pose estimation frameworks including OpenPose, MediaPipe, and ViTPose across image and video datasets.
- Applied interdisciplinary research methodologies to clinical physiotherapy assessment tools in collaboration with healthcare researchers.

Graduate Research Assistantship (GRAF) | [University of Alberta](#) *Sep 2024 – Present*
Edmonton, AB

- Conducting doctoral research under the supervision of Dr. I. Cheng in Computer Vision and Machine Learning.
- Research supported through Mitacs in collaboration with Okaki for clinical human motion analysis applications.

Research Assistant | [University of Alberta](#)
Edmonton, AB

Jan 2024 – Apr 2024

- Performed comprehensive literature review and comparative evaluation of human pose estimation frameworks for downstream biomedical applications.
- Evaluated publicly available pose estimation models under varying imaging and motion conditions.

Computer Vision Research Engineer | [Noralta Technologies Inc.](#)
Calgary, AB

Sep 2023 – Dec 2023

- Developed and validated object detection and segmentation methodologies achieving significant improvements over baseline industrial models.
- Designed preprocessing and model training pipelines for proprietary industrial computer vision datasets.
- Customized YOLOv7 and segmentation architectures for domain-specific detection tasks.

Computer Vision Research Engineer | [CropMind Inc.](#)
Calgary, AB

May 2023 – Aug 2023

- Developed a tree-labeling algorithm using pattern recognition and YOLOv4 for automated orchard analysis.
- Collected and analyzed agricultural datasets while applying augmentation strategies to improve model robustness and generalization.
- Fine-tuned convolutional neural network models for crop feature recognition tasks using transfer learning approaches.

Academic Service & Mentorship

Graduate Student Mentor | [University of Alberta](#)
Edmonton, AB

May 2026 – Present

- Mentoring a junior research student in evaluating SAM-based pose estimation approaches for improving accuracy in clinical human motion analysis pipelines.

Selected Projects

Tree Labeling via Pattern Recognition

- Built a spatial labeling algorithm using YOLOv4 to uniquely identify orchard trees across video sequences.
- Applied centroid and dimensional analysis techniques to minimize label reassignment across frames.

Liver Segmentation & Tumour Detection

- Developed a PyTorch and MONAI-based pipeline for automated liver segmentation and tumour detection in medical imaging datasets.
- Optimized preprocessing and training strategies to improve inference efficiency and segmentation accuracy.

Ultrasound Visualization using VTK

- Developed a VTK-based application for interactive visualization of 3D ultrasound data.
- Implemented image enhancement, isosurface extraction, and Delaunay triangulation techniques for medical visualization workflows.

Cattle Detection under Occlusion

- Evaluated multiple object detection algorithms on drone-captured cattle datasets under challenging occlusion conditions.
- YOLOv7 demonstrated superior performance compared to alternative detection frameworks.

Technical Skills

Programming: Python, R, JavaScript, C#

Computer Vision & Machine Learning: PyTorch, TensorFlow, Keras, OpenCV, MONAI, Scikit-Learn, Scikit-Image

Scientific Computing & Visualization: NumPy, Pandas, SciPy, Matplotlib, Plotly, VTK

Cloud & Development Tools: AWS, Azure, Docker, Git, Jupyter Notebooks, VS Code, PyCharm

Web Technologies: HTML, CSS, Bootstrap, JavaScript, Drupal CMS