

Bimsara Pathiraja

Tempe, AZ | 602-718-9595 | bpathir1@asu.edu | bimsarapathiraja.github.io | github.com/bimsarapathiraja | [Google Scholar](#)

Ph.D. student researching generative models (diffusion and flow matching) for image, video and speech: training-free steering, capability transfer, image editing, preference alignment. Also computer vision and LLM reasoning.

Education

Arizona State University | Ph.D. in Computer Science, GPA 4.00, Tempe, AZ Aug 2023 – Aug 2028 (expected)
Advisors: Chitta Baral and Yezhou Yang.

University of Moratuwa | B.Sc. (Hons) in Electronic and Telecommunication Engineering, First Class Aug 2017 – Jul 2022

Experience

Amazon | Applied Scientist Intern, Seattle, WA May 2026 – Aug 2026
• Research on controllable expressive speech with flow-matching TTS models; first-author paper under review. **Return offer.**

Amazon | Applied Scientist Intern, Virginia May 2025 – Aug 2025
• Worked on object detection and multi-object tracking for image and video. **Return offer.**

Arizona State University | Ph.D. Student, Tempe, AZ Aug 2023 – Present

- Proposed **Discriminant Flow Steering** (first author): transfers a capability from a black-box teacher into an open flow-matching model (FLUX.1-dev) from about 20 teacher images, with no training and no inference overhead. On 126 strict prompts, raises the pass rate from 10.1% to 42.1% (63.9% with negative guidance, on par with per-prompt LoRA).
- Showed the steering vector equals what two-model guidance adds at the first sampling step, so it is computed once offline instead of running a second model at every step. Built DFS-CapBench (200 prompts, 20 capability families) and tested on SD3-medium, a second teacher family and video (Wan2.1).
- Developed **RefEdit** (ICCV 2025, first author): a referring-expression editing benchmark and a model trained on 20K synthetic triplets that outperforms Flux and SD3 baselines trained on millions. Released the benchmark, training data and model checkpoints on Hugging Face.

MBZUAI | Research Assistant with Muhammad Haris Khan, Abu Dhabi, UAE Aug 2022 – Aug 2023
• Developed a train-time method that jointly calibrates class confidence and box localization of object detectors using their predictive uncertainty; first-author paper at CVPR 2023 and a U.S. patent application.

WSO2 | Software Engineer, Sri Lanka May 2022 – Aug 2022
• Fixed and shipped 10+ bugs in the language server of the [Ballerina](#) programming language (Java).

Publications

* equal contribution

In review **Discriminant Flow Steering: Training-Free Capability Transfer in Flow-Matching Models.** Bimsara Pathiraja, Agneet Chatterjee, Chitta Baral, Yezhou Yang. *Under review, 2026.*

ICCV '25 **RefEdit: A Benchmark and Method for Improving Instruction-based Image Editing Model on Referring Expressions.** Bimsara Pathiraja*, Maitreya Patel*, Shivam Singh, Yezhou Yang, Chitta Baral. *ICCV 2025.* [\[paper\]](#)

NAACL '25 **Investigating the Shortcomings of LLMs in Step-by-Step Legal Reasoning.** Venkatesh Mishra*, Bimsara Pathiraja*, Mihir Parmar, Sat Chidananda, Jayanth Srinivasa, Gaowen Liu, Ali Payani, Chitta Baral. *Findings of NAACL 2025.* [\[paper\]](#)

TMLR '25 **Dual Caption Preference Optimization for Diffusion Models.** Amir Saeidi, Yiran Luo, Agneet Chatterjee, Shamanthak Hegde, Bimsara Pathiraja, Yezhou Yang, Chitta Baral. *TMLR 2025.* [\[paper\]](#)

CVPR '23 **Multiclass Confidence and Localization Calibration for Object Detection.** Bimsara Pathiraja, Malitha Gunawardhana, Muhammad Haris Khan. *CVPR 2023.* [\[paper\]](#)

EACL '26 **ExpressivityBench: Can LLMs Communicate Implicitly?** Joshua Tint, Som Sagar, Aditya Taparia, Kelly Raines, Bimsara Pathiraja, Caleb Liu, Ransalu Senanayake. *Findings of EACL 2026* (earlier version at NeurIPS 2024 Workshop on Behavioral ML). [\[paper\]](#)

CVPRW '24 **Fairness in Autonomous Driving: Towards Understanding Confounding Factors in Object Detection under Challenging Weather.** Bimsara Pathiraja, Caleb Liu, Ransalu Senanayake. *CVPR 2024 Workshop (DDADS).* [\[paper\]](#)

arXiv '22 **Class-Aware Attention for Multimodal Trajectory Prediction.** Bimsara Pathiraja, Shehan Munasinghe, Malshan Ranawella, Maleesha De Silva, Ranga Rodrigo, Peshala Jayasekara. *arXiv preprint, 2022.* [\[paper\]](#)

Patents

US '25 **Multiclass Confidence and Localization Calibration for Object Detection.** Bimsara Pathiraja, Malitha Gunawardhana, Muhammad Haris Khan. *U.S. Patent Application 18/392,651, published Mar 2025.* [\[patent\]](#)

Honors

Fulton Fellow Award, ASU (2023) | SCAI Conference Award, ASU (2024) | Sri Lankan IoT Competition (SLIOT), 2nd place (2019)

Skills

ML: PyTorch, Hugging Face Diffusers and Transformers, TensorFlow, TensorRT; FLUX, SD3, Wan, Qwen-VL

Engineering: Python, C, Java, Linux, AWS, Git, ROS, CARLA, Unity