Vin Bhaskara

Applied AI Research & Engineering | Vector AI Scholar |
Kaggle Expert | IIT Silver Medalist | Prev: Samsung AI

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FULL-TIME WORK EXPERIENCE

7+ years of full-time experience in applied AI & software engineering

Senior Applied Scientist, Foundation Models and LLMs — **Borealis AI (RBC Research Institute), Montréal**
Deep Learning for Capital Markets and Credit Modeling at Canada's Largest Bank — Aug 2022 – **Present**

- Led R&D on **fine-tuned MLMs** and **agentic RAG** with **LLMs** for **capital markets**, delivering **$5M+ per desk annually** using **Bloomberg chat data** across Repo, Equity Derivatives, Structured Rates, and U.S. Treasuries trading desks
- Delivered enhanced **Credit Models** using **Foundation Models** trained on proprietary transaction data, **driving $10M+ in annual revenue** across **13M customers** while improving **fairness** and **interpretability**

Research Engineer, Computer Vision — **Samsung AI Centre, Toronto**
Deep Learning for Image Enhancement and Synthesis — Feb 2020 – Jun 2022

- Led projects in Multi-frame Alignment for **Burst Photography** using Neural Implicit Models, and **Self-Supervised Learning** for **blind image denoising (low-light night mode)** and **super-resolution (digital zoom)** on Samsung Galaxy mobile phone cameras

Software Engineer 2 — **Broadcom Inc., India**
Machine Learning and Big Data for Malware Detection — Jul 2016 – Jul 2018

- Co-led the development of an **XGBoost** model in production on **Norton Anti-Virus** by leveraging **Symantec**'s **Big Data** telemetry of file attributes, which reduced **over 60%** of previously missed malware detections
- Led research on **proactive protection against malware** by modeling **Generative Adversarial Networks** (GANs) over a distributed image representation of dynamic file behavior (Preprint: *arXiv:stat.ML/1807.07525*)

EDUCATION

M.Sc. in **Applied Computing** (Deep Learning), Department of Computer Science, 4.0/4.0 (**A+**) — Sep 2018 – Dec 2019
University of Toronto, Downtown Toronto, Canada

- Received the **Vector Institute Scholarship in Artificial Intelligence (VSAI)** valued at $17,500 awarded to **66 scholars in Ontario**
- Thesis: "Robust Single-Shot Object Detection for Computer Vision." Supervisors: Dr. Alex Levinshtein and Prof. Allan Jepson

B.Tech. in **Engineering Physics** with Minor in **Electronics Engineering**, Department **Rank 1** — Jul 2012 – Jun 2016
Indian Institute of Technology (IIT), Guwahati, India

- **Institute Silver Medalist** for the best academic performance in the department among the graduating class of 2016 at IIT Guwahati
- **Primary author** of a **foundational paper** on Quantum Entanglement and **visiting scholar** at the **Institute for Quantum Computing** (IQC), University of Waterloo, Canada

SELECTED PEER-REVIEWED PUBLICATIONS

Citations: **298**, h-index: **8** - Google Scholar

1. **V.S. Bhaskara***, T.A. Armstrong*, A. Jepson, A. Levinshtein. "GraN-GAN: Piecewise Gradient Normalization for Generative Adversarial Networks," *WACV 2022 Conference* (2022 IEEE Winter Conference on Applications in Computer Vision) Jan 2022
2. **V.S. Bhaskara***, H. Wang*, A. Levinshtein*, S. Tsogkas, A. Jepson. "Efficient Super-Resolution Using MobileNetV3," *ECCV 2020 Workshop* (2020 European Conference on Computer Vision Workshop) Jan 2021
3. **V.S. Bhaskara***, S.N. Swain*, P.K. Panigrahi. "Generalized Entanglement Measure for Continuous-Variable Systems," *Physical Review A (PRA) 105, 052441 (2022)*, American Physical Society May 2022
4. **V.S. Bhaskara**, P.K. Panigrahi. "Generalized concurrence measure for faithful quantification of multiparticle pure state entanglement using Lagrange's identity and wedge product," *Quantum Inf. Process. 16 (5), 118*, Springer Mar 2017
5. J. Flannery, G. Bappi, **V.S. Bhaskara**, O. Alshehri, M. Bajcsy. "Implementing Bragg mirrors in a hollow-core photonic crystal fiber," *Optical Materials Express 7 (4), 1198*, Optical Society of America Journal Mar 2017
6. C.M. Haapamaki, J. Flannery, G. Bappi, R. Al-Maruf, **V.S. Bhaskara**, O. Alshehri, T. Yoon, M. Bajcsy. "Mesoscale cavities in hollow-core waveguides for quantum optics with atomic ensembles," *Nanophotonics 5 (1)*, De Gruyter Journal Sep 2016

(Denotes equal contribution)*

GRANTED PATENTS

1. H. Wang, X. Sun, **V.S. Bhaskara**, S. Tsogkas, A. Jepson, A. Levinshtein. "Unsupervised Super-Resolution Training Data Construction," Samsung AI Centre Toronto, *US Patent 12,210,587* Jan 2025

NOTABLE ACHIEVEMENTS

- **Top 5%** (201st of 4,436 teams) in a **solo submission**, earning a **Kaggle Silver Medal** for predicting Nasdaq **stock price movements** on **real market data** from **Optiver** 2024
- "**Samsung Research America Rockstar**" peer-to-peer recognition award 2021
- Selected for **AI Residency Program** at **Google X**, Mountain View (did not accept the offer) 2019
- **Symantec WOW** (Winning Our Way) Level 1 & Level 3 **company-wide recognition awards** for "exceptional performance through focused collaboration with teams" 2018
- **Kaggle 'Competitions Expert'** ranking for being placed **835 out of 69,593** competing data scientists 2017
- Shortlisted **among 25 students selected internationally** for USEQIP 2015 Summer School at the Institute for Quantum Computing and the **Perimeter Institute** for Theoretical Physics in Waterloo, Canada 2015
- National Initiative on Undergraduate Science (NIUS) **scholarship** awarded by the **Tata Institute of Fundamental Research** (TIFR) for pursuing research at leading physics labs in India for the year 2013

OTHER RESEARCH ARTICLES

1. **V.S. Bhaskara**, S. Tsogkas, K. Derpanis, A. Levinshtein. "Part-based Auxiliary Objectives with No Extra Labels for Robust Single-Shot Object Detection," *dx.doi.org/10.13140/RG.2.2.10079.47521* Apr 2020
2. **V.S. Bhaskara**, S. Desai. "Exploiting uncertainty of loss landscape for stochastic optimization," *arXiv:cs.LG/1905.13200* May 2019
3. **V.S. Bhaskara**, Y. Fu, S. Gowda. "Risk Prediction in the General Internal Medicine Ward at St. Michael's Hospital," *dx.doi.org/10.13140/RG.2.2.27695.55205* Apr 2019
4. **V.S. Bhaskara**, D. Bhattacharyya. "Emulating malware authors for proactive protection using GANs over a distributed image visualization of dynamic file behavior," *arXiv:stat.ML/1807.07525* Jul 2018

SELECTED PROJECTS

Improving Object Detection in Cluttered Scenes — **Research Intern, Samsung AI Centre**
Supervised by Dr. Alex Levinshtein and Prof. Allan Jepson (University of Toronto) May 2019 – Dec 2019

- Improving object detection in cluttered scenes using **part-based auxiliary targets** with single-stage methods for **on-device inference**

Machine Learning to Assess a Patient's Risk of ICU Transfer in the ER — **Research Visitor, St. Michael's Hospital**
Supervised by Prof. Marzyeh Ghassemi (MIT) Feb 2019 – Apr 2019

- Utilizing patient data from the General Internal Medicine ward to assess a patient's **risk of ICU transfer or death** early
- Proposed a **data-driven regularization layer** that improved generalization and interpretability of predictions by incorporating **ICD-10 diagnosis codes** into the model (without requiring them during inference)

Enhancing the Adam Optimizer by Leveraging Loss Landscape Uncertainty — **Graduate Researcher, University of Toronto**
Supervised by Prof. Roger Grosse and Prof. Jimmy Ba (University of Toronto) Jan 2019 – May 2019

- Developed a novel variant of **momentum** that leverages the **variance of loss landscape** during training as an **exploration** bonus
- Incorporating into Adam, our method demonstrates up to **6% improvement in validation accuracy** and significantly **faster convergence** in training CNNs on CIFAR-10 compared to the original Adam optimizer

Improved Curious Agent for Learning Better World Models — **Graduate Researcher, University of Toronto**
Supervised by Prof. Jimmy Ba (University of Toronto) Sep 2018 – Dec 2018

- Developed a novel curiosity reward formulation by designing a **curious-critic module** for **sample-efficient exploration** of stochastic state spaces in **model-based Reinforcement Learning**, effectively addressing **catastrophic forgetting** of past experiences

TECHNICAL SKILLS

- **Programming & Scripting**: Python, C++, Java, C, Bash (Unix Shell)
- **Databases & Big Data**: SQL (RDBMS), NoSQL, Hadoop Ecosystem (Hive, Oozie, HDFS, MapReduce)
- **Packages & Frameworks**: PyTorch, JAX, HuggingFace Transformers, XGBoost, Pandas, Weights & Biases

ACADEMIC SERVICE

- **Program Committee** member for AAAI 2026 2025 – Present
- **Academic Reviewer** for NeurIPS 2025, ICML 2025, CVPR 2025/2023, ICCV 2023, WACV 2023 2023 – Present
- **Mentor to Graduate Students** at Mila (Quebec Artificial Intelligence Institute) 2022 – 2023
- **Mentor to Undergrad Students** at the Department of Computer Science, University of Toronto 2022 – Present
- **Research Supervision** to undergraduate student teams through the "Let's Solve It" program of Borealis AI 2022 – Present

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