Vin Bhaskara

AI Research & Engineering | Vector AI Scholar | IIT Silver Medalist   🌐 vinbhaskara.github.io,   ✉ vin.bhaskara@gmail.com
Kaggle Competitions Expert (Top 5% Global, 5 Medals) | Prev: Samsung AI, UofT   Citizenship: Canadian

FULL-TIME WORK EXPERIENCE   **8+ years** of full-time experience in AI and 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 **$5MM+ per desk annually** using **Bloomberg chat data** across Repo, Equity Derivatives, Structured Rates, and U.S. Treasuries trading desks
- Development, validation and deployment of a flagship **Credit Capacity** product using **Foundation Models** trained on proprietary transaction data, **driving ~$200MM in 5-year NIBT** across **13 million 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: **300+**, 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

PREPRINT PUBLICATIONS

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

TECHNICAL SKILLS

- **Languages**: Python, C++, Java, C
- **Frameworks**: PyTorch, JAX, HuggingFace Transformers, TensorFlow, XGBoost
- **Databases**: SQL, NoSQL; **Big Data**: Hadoop, HDFS, MapReduce

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

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

ACADEMIC SERVICE

- **Academic Reviewer** for ICLR 2026, NeurIPS 2025, ICML 2025, CVPR 2023–2026, 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