Vin Bhaskara

AI Research Engineer | Vector AI Scholar |
Kaggle Expert | IIT Silver Medalist | Prev: Samsung AI

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EDUCATION

M.Sc. in **Applied Computing**, 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 highly cited paper** on Quantum Entanglement and **visiting scholar** at the Institute for Quantum Computing (IQC), University of Waterloo, Canada

WORK EXPERIENCE

7+ years of full-time experience in applied AI

Senior Research Engineer, Foundation Models and LLMs **Borealis AI (RBC Research Institute), Montréal**
Deep Learning for Capital Markets and Credit Modeling Aug 2022 – **Present**

- Led R&D on **Foundation Models** and **agentic RAG-based LLMs**, leveraging RBC's proprietary financial data for **credit modeling** and **capital markets applications**, including Repo, Equity Derivatives, and US Treasuries trading desks
- Improved **Credit Models** to generate over **$10 Million CAD** in annual incremental revenue across **13 Million customers** while **enhancing fairness** by mitigating historical bias across sensitive variables

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, Big Data and Machine Learning **Broadcom Inc. (formerly Symantec), India**
Machine Learning 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*)

PEER-REVIEWED PUBLICATIONS

Citations: **285**, h-index: **8** on Google Scholar as of Mar 2025

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)

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 (Granted)* Jan 2025

PREPRINTS

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

RESEARCH INTERNSHIPS

Research Intern, Computer Vision **Samsung AI Centre, Toronto**
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

Research Visitor, Machine Learning for Health **St. Michael's Hospital, Toronto**
Supervised by Prof. Marzyeh Ghassemi (University of Toronto) 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)

Undergrad Research Assistant, Nano-Photonics **Institute for Quantum Computing (IQC), Waterloo**
Supervised by Prof. Michal Bajcsy (University of Waterloo) May 2015 – Jul 2015

- Evaluating novel hollow-core **photonic-crystal fibre** designs by simulating EM wave propagation for on-chip photonic transistors

ACHIEVEMENTS

- **Placed in the Top 5%** (201st of 4,436 teams) and earned a **Kaggle Silver Medal** in a **solo submission** for predicting Nasdaq stock closing price movements **using 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

TECHNICAL SKILLS

- **Scripting/Languages**: Python, C++, Java, C, Unix Shell
- **Databases**: SQL (RDBMS), NoSQL, Big Data on **Hadoop** (Hive, Oozie, HDFS, MapReduce)
- **Packages**: PyTorch, HuggingFace Transformers, XGBoost, Pandas, Eigen, Libigl

ACADEMIC SERVICE

- **Academic Reviewer** for ICML 2025, CVPR 2025/2023, ICCV 2023, WACV 2023
- **Mentor to Graduate Students** at Mila (Quebec Artificial Intelligence Institute) 2022 – 23
- **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

REFERENCES

- **Dr. Alex Levinshtein**, Research Director at Samsung AI Centre Toronto
- **Prof. Allan Jepson**, Professor Emeritus at the University of Toronto (Previously VP/Chief Scientist at Samsung AI Centre Toronto)