

# Shivesh Prakash

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## EDUCATION

**University of Toronto, Honors Bachelor of Science (GPA: 4.0)** April 2025

- Specialist in Computer Science, Focus in AI, Computer Vision, Scientific Computing and Minor in Statistics
- International Scholar \$92,500, Faculty Award \$7,500, Dr. James A. Scholarship \$500, and Dean's List Scholar

**Narayana e-Techno School, High School (GPA: 4.0)**

- CBSE Class 12 - Overall 98.2%, 99% in Math and CS, Term 1 Full Scorer, 100% in all subjects, 97% in class 10
- JEE All India Rank 389, State Topper and 2×National top 1% in Physics Olympiad Qualifier, 2×KVPY Scholar

## EXPERIENCE

**Undergraduate Researcher, University of Toronto** February 2023 – Present

- Conducting research with Prof. Hans-Arno Jacobsen's Middleware Systems Research Group to predict faster, cheaper, greener, and efficient pathways for synthesizing critical chemical compounds through machine learning
- Conducting research with Prof. Alex Mariakakis's Computational Health and Interaction Lab for material sensing via mobile cameras utilizing hyperspectral imaging and machine learning methodologies
- Member of Profs. David Lindell and Kyros Kutulakos's Toronto Computational Imaging Group

**Machine Learning Project Lead, University of Toronto Aerospace Team** October 2022 – Present

- Currently leading the Keystone project, aimed at resolving the keystone distortion in hyperspectral imaging
- Previously, as a developer, automated programs to extract reference data and generate artificial SMILE shift in the data, resulting in a robust testing framework for validating the ML algorithms, brought run time down to 65 seconds

**Computer Science Educational Content Developer, University of Toronto** May 2023 – September 2023

- Collaborated with Professor David Liu to develop material for UofT's flagship first-year CS courses
- Reviewed and edited worksheets, comprising over 3000 lines of instructive Python code, to ensure accuracy
- Created over 20 graphs, figures, and animations to enhance course notes, doubling the amount of visual material

**Software Developer Intern, Sigma Infosolutions** April 2021 – May 2021

- Worked on the BI and Analytics project, converting raw data into visually appealing graphs using PyGraph library
- Transformed large volumes of data into 10+ aesthetic visual graphs, providing valuable insights for stakeholders

## PROJECTS

**DygnosTech** | Python, Keras, OpenCV, Tensorflow, Web Assembly, Streamlit, HTML/CSS, Twilio November 2022

- Utilized a GAN's based model for drug side effect predictions, optimizing models via WebAssembly for performance
- Streamlit, Graphviz and CSS empowered the user-friendly web UI, while Twilio allowed messaging functionality

**Weed Detech** | Python, Keras, Tensorflow, Streamlit, Git November 2022

- Web application that allows farmers to pinpoint unwanted weeds
- Model created by transfer learning using a ConvNeXt model trained on ImageNet, optimized using Grappler

**tPay** | Python, Keras, Tensorflow, Django, HTML/CSS, Javascript October 2022

- A secure facial recognition-based payment system, eliminating the need for physical Tcards
- Utilized transfer learning with MobileNet, TensorFlow, and Keras to train a model on 3000+ images

## PUBLICATIONS

1. 'Efficient Training of Transformers for Molecule Property Prediction on Small-scale Datasets'(Preprint Research Paper): Achieved state-of-the-art performance in detecting the Blood-brain Barrier Permeability using the MoleculeNet Dataset. The paper proposes a GPS Transformer architecture augmented with Self Attention.
2. 'Hindu Students' Council at the University of Toronto'(Article): Published in a special edition magazine commemorating the 185<sup>th</sup> anniversary of arrival of Indians to the West.
3. 'Upanishads – Learnings and Modern Applications'(Article): Published in India's premier newspaper The Statesman, this article links ancient Upanishad texts with the modern concepts of Quantum Physics.

## TECHNICAL SKILLS

**Languages:** Python, C/C++, Java, SQL, JavaScript, HTML/CSS, R, Matlab

**Tools:** Git, TensorFlow, Keras, Pytorch, ScikitLearn, NumPy, SciPy, Android Studio

**Courses:** ML and Deep Learning Specialization by Stanford, Microsoft Azure AI Fundamentals, Harvard CS50's Intro to CS

## EXTRACURRICULAR ACTIVITIES

**Co-Founder and Vice President, UofT Computer Vision Club** June 2023 – Present

- Built a community of over 100 members on Discord, organized and led multiple research paper discussion events

**Founder and Chief Developer, Cyber Literacy - Curated Online Information** March 2020 – October 2021

- Developed the Cyber Literacy app using Android Studio and Java, incorporating SQL to enhance user experience
- It has over 100 downloads and provides resources on cybercrime, cyberbullying, laws, and etiquette