Varun Sahni

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Education

University of Toronto - St. George — Toronto, ON
Bachelor of Science in Computer Science — *Expected April 2026*
CGPA: 4.0/4.0

Technical Skills

Languages: Python, C, JavaScript, Java, SQL, HTML/CSS
Frameworks: Flask, React.js, Node.js, MYSQL, MongoDB, Express.js, Next.js
Developer Tools: Git, Heroku, Visual Studio, PyCharm, IntelliJ
Libraries: PyTorch, TensorFlow, PySpark, SciPy, Scikit-Learn, PyMongo, SQLite, Pandas, NumPy, Matplotlib

Experience

University of Toronto — Sep. 2023 – Present
Machine Learning Research Assistant — *Toronto, ON*
- Building a multiheaded model based on a **Variational Autoencoder** and **dueling DQN** architecture using **PyTorch** to reconstruct masked images
- Applying the model to simulate social cognition gaps in humans under the supervision of Dr. Cunningham

University of Toronto — Sep. 2023 – Dec. 2023
Software Developer — *Toronto, ON*
- Developed a **Python** package (PythonTA) used by **10000+ students** to analyze code using an AST parser
- Implemented a **runtime tracer** to visualize recursive function execution by constructing a custom tree structure

Canadian Society of Echocardiography — Jul. 2023 – Nov. 2023
Software Developer — *Toronto, ON*
- Developed a custom full-stack technology for the official website with over **2.1 million user engagements**
- Designed a measurement system using **OpenCV** and **TypeScript** for **25 labs** to train **800+ doctors**
- Built a permission-based invitation infrastructure that gives access via email using **NextJS** and **MySQL**

RBC Capital Markets — May 2023 – Aug. 2023
Software Developer Intern — *Toronto, ON*
- Developed an API using **Python-Flask** that dynamically generates code to **reduce time spent by 95%**
- Implemented a **Python-MSSQL** backend server to automate data lineage tracking and **save 20+ hours/week**
- Created a full-stack fintech platform using the functional language Elm and FINOS-Morphir to be showcased in a corporate tech summit

Projects

Sonoverse (TreeHacks 2024 @ Stanford Winner) | *PyTorch, Python, Next.js, AWS S3, PostgreSQL* | **Devpost Link**
- **Blockchain** app that uses **deep learning** to automate DMCA enforcement on social media platforms
- Built and trained a dual-headed **LSTM using PyTorch** to detect remixed songs or parodies with **93% accuracy**
- Created an **Ethereum L2 chain** powered by Caldera to store original works and issue authenticity certificates

re.live (UofTHacks XI Winner) | *Python, OpenCV, Mediapipe, Azure API, React.js, Cohere* | **Devpost Link**
- Multimedia app that uses **computer vision** and a **diffusion model** to map and transfer dance moves to images
- Fine-tuned a pre-trained model to accept skeletons generated from dances using Mediapipe with **94% accuracy**
- Used Cohere for **KNN semantic search** and re-ranking on captions generated from images using Azure CV API

Code Flow (Hack The North 2023 Winner) | *Python, MongoDB, Flask, React.js, PyVis, Cohere* | **Devpost Link**
- **NLP-powered** web app that performs static code analysis on a project to **reduce onboarding time by 90%**
- Identified relevant files using a **KNN algorithm** and processed the code using Cohere to answer user questions
- Implemented syntactic parsing to generate a node-based visual for code in a file/folder to show its connectivity

Tune Turn (MakeUofT 2023 Winner) | *Java, OpenCV, Android Studio, Qualcomm HDK 8450* | **Devpost Link**
- Android app that uses **computer vision** to turn to the next page of sheet music with a head gesture
- Used Qualcomm HDK 8450 development kit for testing and to process which direction to turn the page
- Optimized model to deliver **1 second responses and 93.4% accuracy** resulting in quick and accurate turns