

EDUCATION

Bachelor of Science, Major in Computer Science and Statistics
University of British Columbia, Vancouver

Sept 2022 - Present

- GPA: 4.0, Dean's List 2023, 2024
- Software Lead@Open Robotics, Data Science Club, Undergraduate Mathematics Society, UBC Sikh Association
- Relevant Coursework: Calculus, Data Structures and Algorithms, Linear Algebra, Probability, Computer Systems, Software Construction

PRE-PRINTS

Iris and Palmprint Multimodal Biometric Recognition using Novel Preactivated Inverted ResNet and Hybrid Metaheuristic Optimized DenseNet

Indu Singh, **Gunbir Singh Baveja**, Shruti Khatri, Sunaina Luthra, and Tanvi Singh
IEEE Transactions on Machine Learning in Communications and Networking

PROJECTS

Data-Efficient Exploration with Self Play in Open-ended environments

April 2024

- Implemented Provable Self-Play Algorithms for Competitive Reinforcement Learning in PyTorch.
- Compared our method with SOTAs such as SelfPlayer, GoExplore, Curiosity, PPO, Rainbow, SimPLe
- Demonstrated the sample-efficiency of VI-ULCB, proving the algorithm to be robust for open-ended problems.

Schizospeak: An Esoteric Programming Language

July 2023

<http://npmjs.com/package/schizospeak>

- Developed Parser, a Lexer, and Interpreter using TypeScript and incorporated expressions, declarations, identifiers, and literals types.
- Implemented self-recursive code and depth-first search algorithm to solve logical lexical morphology of the language.
- Created the language to support Expressions: assignment, binary, call, and member expressions; Declarations: variable, function, if, and for declarations; and Literals: numeric, string, and object literals.

Alokhe

February 2022

<https://github.com/sheerio/alokhe>

- Developed symbolic code in Python to perfectly transliterate from English to Hindi using phonosyntactic rules of linguistics.
- Used flask to create and host a REST API for Alokhe.
- Created a discord bot using JavaScript that used Alokhe API and OpenAI API with the ability to transliterate English to Hindi and Hinglish (Hindi written in the alphabet) to Hindi.

AutoTechnoblade

November 2020

<https://socialblade.com/twitter/user/autotechnoblade>

- Fine-tuned GPT-2 on Technoblade's tweets using few-shot learning.
- Created a Twitter bot using Python and JavaScript.

WORK EXPERIENCE

Software Team Lead, Fast.ai, PyTorch, Arduino, Python
Open Robotics

November 2023 - Present
Remote

- Leading a six-member software team for the Pianobot project.
- Directed the development of the MIDI and Arduino translators.
- Implementing Reinforcement Learning (RL) algorithms to optimize for technical efficiencies and working towards more autonomous behavior of the robot – allowing for real-time improvisation.

Research Intern, PyTorch, OpenCV, Matplotlib,
Delhi Technological University

June 2023 - August 2023
Delhi, India

- Under the supervision of Dr. Indu Singh: formulated, designed and implemented a novel two-fold multimodal recognition architecture with histogram equalization with FALF-SVR, a pre-activated Inv-ResNet block with spatial attention and global-local JFPA-ROA search-matching.

Machine Learning Intern, TensorFlow, OpenCV, MongoDB, Python
Bausch + Lomb

April 2020 - July 2020
Remote

- Implemented data augmentation techniques to diversify and expand the training dataset.
- Utilized incremental learning methodologies for continuous improvement of the model over time and developed a large-scale model that demonstrated enhanced accuracy in predicting stock levels.

Research Intern, Python, SKLearn, Tensorflow, MATLAB
GD Goenka University

August 2020 - November 2020
Sohna, India

- Conducted research under the supervision of Dr. Jaspreet Singh in the department of Computer Science and Engineering.
- Created an earthquake magnitude prediction model using Extreme Learning Machines and Support Vector Machines.

PRESENTATIONS

Scalable Unsupervised RL with Metric-Aware Abstraction
KAIST · Reinforcement Learning Reading Group

June 2024

Skill-based Model-based Reinforcement Learning
KAIST · Cognitive Learning for Vision and Robotics Group

March 2024

AWARDS AND GRANTS

- **International Work Terms Grant:** UBC Vancouver Co-Op (\$1,000)
- **Outstanding International Student Award:** UBC Vancouver (\$10,000)
- **Second Award, Global Youth Science and Technology Bowl:** independent project. Awarded by The Hong Kong Federation of Youth Groups.
- **Grand Award, IRIS National Fair:** Selected amongst around 1000 teams to represent India at the Intel Science and Engineering Fair. Awarded by the Ministry of Science and Technology of India.
- **Finalist, Intel Science and Engineering Fair.** Represented India for my research at the largest science fair in the world.
- **Most Outstanding Exhibition in STEM, IRIS National Fair:** awarded by Yale Science and Engineering Association at the IRIS National Fair.
- **Bronze Medal, Asia Pacific Linguistics Olympiad (APLO):** selected as member of alternate team for India at the International Linguistics Olympiad (IOL) 2022. *APLO Rank 8, PLO Rank 11.*

SKILLS

Frameworks
Programming
Graphics

OpenCV, fastai, PyTorch, Tensorflow, SciKit/XGBoost, Swing, React, NumPy
Python, Java, C/C++, Git, JavaScript, TypeScript, L^AT_EX, Matlab, MarkDown
Blender, Autodesk Maya, Unreal Engine, Adobe Illustrator