

JIVJOT SINGH

Ludhiana, Punjab

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PERSONAL PROFILE

An IISER Mohali Physics graduate student with a minor specialization in Data Science, transitioning to a career as **Machine Learning Researcher**. Deeply passionate to combine my expertise in Astrophysics with Machine Learning to leverage my knowledge & skills for positive societal change.

WORK EXPERIENCE

Indian School of Business

Research Intern @ Institute of Data Sciences

Mohali, India

Jun 2023 - Present

Capstone Project

- Generating data-driven strategic insights to enhance the efficiency of the Punjab Government's Grievance Redressal System
- Working on Multi-lingual Code-mixed seeded translation using AI4Bharat base libraries
- Developing interactive graph, enabling clear communication of the derived insights to stakeholders and facilitating informed decision-making

Research Project

- Operating within a dynamic Big Data environment, leading **Data Mining** of news articles from the last 150 years
- Harnessing the power of GPU computations to perform **Topic Modelling** through Latent Dirichlet Allocation & Transformers
- Creating Graph Networks of keyphrases extracted by running **Community Detection Algorithms** to uncover historical narratives

Technical Skills: Pandas, Plotly, Selenium, **Data Mining, Natural Language Processing**

Soft Skills: Research, Documentation, Communication, Presentation skills

Tatras Data

Project Intern

Mohali, India

May 2023 - Jun 2023

Political Discourse

- Scraped social media handles of Political leaders to perform Sentiment Analysis before and after a political event
- Performed Transliteration & Translation tasks on text comments from Hindi and Punjabi to English using Hugging Face models

Trendspotter

- Facilitated the identification of small to medium-scale food influencers within specific geographic regions, scraped Instagram using Selenium
- Fine-Tuned Keras models like ResNet50, achieving accuracy of 97.36% on classifying Food-vs-NonFood images to enhance filtering

Technical Skills: Selenium, Pandas, **Keras**

Soft Skills: Teamwork, Time Management, Communication, Multi-tasking

Sabudh Foundation

Data Science Intern

Mohali, India

Jan 2023 - Jun 2023

- Acquired in-depth understanding of Data Science and Machine Learning concepts through advanced courseworks and coding challenges
- Consistently maintained a top performance level throughout the entire 6-month period
- Seasoned with Data Structures & Algorithms, Statistics, Linear Algebra, Probability, **Deep Learning** and **Natural Language Processing**
- Excelled in Kaggle competitions like Frame Level Speech Recognition and BBC Document Classification
- Built a Medical Chatbot powered by RASA and Python as part of the Passion Project with the presentation delivered through Quarto

Technical Skills: NumPy, Matplotlib, Pandas, Scikit-learn, BeautifulSoup, Git, Quarto

Soft Skills: Teamwork, Time Management, Communication, Presentation skills

UNIVERSITY PROJECTS

Speech Recognition

Indian Institute of Science Education and Research, Mohali

Mohali, India

Mar 2023 - Apr 2023

- Thoughtfully devised Sequence Models using non Recursive Nets making use of residual connections to classify at a frame level
- Engineered feature-expansion approaches by parameterizing temporal context through customizing TensorFlow generators
- Constructed Dense and Convolution Deep Residual Networks by combining Functional, Sequential and Sub-classing methods
- Built Bidirectional-Recurrent models using GRU, LSTM and Encoder-Decoder architectures to classify at an utterance level

Technical Skills: TensorFlow, Linear Algebra, **Object-Oriented Programming**, NumPy, Plotly

Soft Skills: Notes-making, Documentation, Creativity

Multi-Layer Perceptron using NumPy

Indian Institute of Science Education and Research, Mohali

Mohali, India

Feb 2023 - Mar 2023

- Successfully created an object-oriented codebase that implements the complete architecture of MLP from scratch
- Created different methods of weight initializations and activation maps alongwith Stochastic Mini-batch Gradient Descent with momentum
- Tested on the MNIST data which resulted in 98.00% validation accuracy using a deep architecture

Technical Skills: Calculus, Linear Algebra, **Object-Oriented Programming**, Fine-tuning, Plotly

Soft Skills: Notes-making, Documentation, Creativity

IPL batting partnership Network Analysis

Indian Institute of Science Education and Research, Mohali

Mohali, India

Sep 2022 - Oct 2022

- Aggregated the partnership statistics by Web Scraping the ESPN website
- Built dynamic Network Graphs to rank key players based on various Centrality measures
- Discovered that the IPL batting Network is very weak Dis-assortative type using the Average Nearest Neighbor Degree results
- **Technical Skills:** Python, **Data Mining**, RegEx, BeautifulSoup, Pandas, NetworkX, Pyvis, \LaTeX
- **Soft Skills:** Report writing, Presentation skills, Logical & Critical Thinking

MASTERS THESIS

Dissertation: Multi-wavelength analysis of the NGC 3227 group using AstroSat

Indian Institute of Science Education and Research, Mohali

Mohali, India

May 2022 - Apr 2023

- Studied the dynamics of Star-forming galaxies within an interacting system, employing a comprehensive multi-wavelength approach
- Conducted comprehensive statistical analysis on astronomical sources extracted from AstroSat-UVIT's FUV image of galaxy NGC 3227
- **Designed code** implementing an innovative approach for distinguishing faint objects between Point sources and Extended objects utilizing Point Spread Function and χ^2 test-based classification
- Modelled a Spectral Energy Distribution (SED) model by integrating data from AstroSat-UVIT, GALEX, SDSS, WISE, and IRAC
- **Discovered an exciting Tidal Dwarf Candidate**, exclusively observable in the AstroSat data of the Far Ultraviolet band, to gain insights into the Star Formation Rates in interacting galactic systems
- Effectively communicated the findings of my data analysis to the Astrophysics Thesis committee through meticulously compiled results showcased in Poster, PowerPoint, and \LaTeX presentations as part of the Masters Research Project under the guidance of Prof. Kulinder Pal Singh
- **Technical Skills:** Python, SciPy, Matplotlib, SOURCE EXTRACTOR, MAGPHYS, \LaTeX , PowerPoint
- **Soft Skills:** Research, Time Management, Presentation skills, Report & **Thesis writing**

EDUCATION

Indian Institute of Science Education and Research, Mohali

BS-MS with Major in Physics & Minor in Data Science

Mohali, India

Aug 2018 - May 2023

- Demonstrated Physics Experiments to Punjab School kids as a **volunteer** at IISER-Mohali Foundation Day (2018 & 2019)
- **Relevant Courses:** **Python programming**, Analysis in one variable, Introduction to Cryptography, **Probability & Statistics**, Math methods for physicists, Statistical Mechanics, Non-linear dynamics & complex systems, **Data Science**, **Machine Learning**, **Design & analysis of algorithms**

Sacred Heart Senior Secondary School

High School

Ludhiana, India

Mar 2016 - Apr 2018

- **Bagged 1st place** for Radiometer Construction at Science Exhibition
- **Subjects:** Physics, Chemistry, Maths and Fine Arts

SKILLS

Data Science	Python, Probability, Statistics, Linear Algebra, Data Structures & Algorithms, Data Mining
Machine Learning	Supervised & Unsupervised Learning, Feature Engineering, Deep Learning, TensorFlow, Keras
Natural Language Processing	Speech Recognition, Topic Modelling, Conversational AI
Miscellaneous	\LaTeX , Git, Linux, Microsoft Office
Soft Skills	Adaptability, Time Management, Multitasking, Problem-solving skills, Documentation, Creativity

INTERESTS

Art	I dedicate my free time to painting and sketching as a form of artistic expression.
Technical Writing	I began posting on LinkedIn where I combine GitHub-hosted IPython Notebooks with digital notes on ML

LANGUAGES

English	Professional proficiency
Punjabi, Hindi	Native proficiency