Chris Francis

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Education

University of California San Diego ***2022 - 2024***
MS in Computer Science California, USA

Indian Institute of Technology Gandhinagar ***2018 - 2022***
BTech in Computer Science and Engineering [CPI: 9.77/10] (Transcript, Graduation Medals) Gujarat, India

Technical Skills

Languages: Python, JavaScript, C, C++, HTML, CSS, Dart, Verilog

Tools: PyTorch, TensorFlow, Keras, MySQL, OpenCV-Python, PyQt5, Flutter, AWS SageMaker, Flask, Numpy, Pandas, Bash, Linux, Plotly, LaTeX, Autodesk Inventor, Autodesk Fusion 360, Adobe Illustrator, Adobe Photoshop

Experience

Research Intern, California Institute of Technology (Remote) ***May - July 2021***
- Developed machine learning models with TensorFlow to identify the species present in low-biomass metagenomic samples and achieved a classification accuracy of around 81%.

Teaching Assistant, Data Structures and Algorithms-I, IIT Gandhinagar ***August - December 2020***
- Delivered guest lectures on C programming, linked lists, tree traversal, and coding problems.
- Designed coding questions and tested solutions for course assignments and quizzes.

Research Intern, Indian Institute of Science, Bangalore (Remote) ***May - June 2020***
- Worked on data visualization and parameters for a data-driven partial differential equation based model of COVID-19 infections using Python, Numpy, Pandas and Plotly.
- Developed a webpage to display the results of the model using JavaScript, HTML, and CSS. The webpage included time-series plots using FusionCharts.js and choropleth maps using Leaflet.js.

Application Developer, InsIIT: An all-in-one app for IIT Gandhinagar students ***May - June 2020***
- Developed the InsIIT App, using Flutter, under Students' Summer Online Projects (SSOP) 2020 at IIT Gandhinagar.
- Implemented the campus map feature using the Google Maps and Sheets APIs which enables users to search for, read about, and get directions to their desired location.

Co-inventor, FoodBuddy: An assistive dining device for the disabled, Invent@IITGN ***May - June 2019***
- Invented a voice-controlled robotic device that assists people with arm disabilities to eat independently.
- Achieved more than 1000% cost reduction from existing solutions. Enhanced portability and user experience.
- Filed provisional patent applications for the invention in India (IN201941027110) and USA (US62912080).

Publications

SpiroMask: Measuring Lung Function Using Consumer-Grade Masks
- Developed a system for estimating lung-health parameters by employing machine learning and audio sensors fitted in consumer-grade N95 and cloth masks with an error rate less than 5%. Accepted in ACM Transactions on Computing for Healthcare (doi).

Projects

Adaptive Candidate Assessment for Subjective Tests ***August - November 2021***
- Developed a system for adaptive candidate assessment for subjective tests using natural language processing and machine learning with PyTorch (GitHub repository).
- Created a dataset of subjective question-answer pairs from NCERT textbooks and reference books.

Acad Search: A search engine to find professors in computer science ***January - May 2021***
- Developed a search engine using Python and Flask that can cater to the needs of students looking for professors to approach for projects, internships, or jobs (GitHub repository).
- Implemented boolean retrieval, phrase-based retrieval, and TF-IDF (Term Frequency-Inverse Document Frequency) based retrieval.

Cross-Modal Learning for Fashion Image-Text Retrieval ***January - May 2021***
- Implemented cross-modal machine learning methods like Siamese Networks, Correlational Networks, and Deep Cross-Modal Projection Learning in PyTorch for image-text retrieval in the fashion clothing domain (GitHub repository).

Mini-Classroom: Classroom Management Software in C++ ***September - November 2020***
- Developed a CLI classroom management software, with features similar to Google Classroom, from scratch using C++ (GitHub repository).

Relevant Coursework

Machine Learning, Natural Language Processing, Introduction to Data Science, Data Structures and Algorithms - I, Data Structures and Algorithms - II, Operating Systems, Compilers, Databases, Computer Networks, Discrete Mathematics, Computer Organization and Architecture, Theory of Computation, Probability and Random Processes, Modeling and Simulation of Complex Systems