SUDHAMSHU HOSAMANE

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SKILLS PROFILE

- Seeking summer 2022 internships in Data Science, Analytics, NLP or Machine Learning
- Skills: Machine Learning (ML), Natural Language Processing (NLP), Data Visualization, Information Retrieval and Text Mining, Time Series Analysis, Statistical methods, Social Science Research Methodology
- Technical Proficiencies: C, C++, Python (Advanced); Python libraries (scikit-learn, Pandas, NumPy, SciPy, Requests, Flask, NetworkX, NLTK, spaCy), MATLAB, R, Git (Intermediate); MySQL, BASH, Product experimentation (A/B testing, Multivariate testing and Multi-armed Bandit testing), Linux, Distributed systems (Spark), Web Development (JavaScript, HTML, CSS), and Visualization (Tableau desktop, d3.js) (Basic)
- Recent Courses: Content Analysis and Text Mining, Mathematics for Machine Learning, Social Network Analysis, Perspectives on Computational Analysis, Internet Censorship and Online Speech

EDUCATION

The University of Chicago, Chicago, IL USA
Master of Arts (STEM), Computational Social Science; CGPA – 3.77/4.00
Concentration: Machine Learning, Marketing and Sociology, June 2023

Birla Institute of Technology & Science (BITS), Pilani, India
Bachelor of Engineering, Concentration: Electronics and Instrumentation, February 2018

EXPERIENCE

The University of Chicago, Chicago, IL USA
Graduate Student Researcher, January 2022 – Present

- Providing research support to Dr. James Evans on the '*Mapping International Cultures'* Project
- Learning to draw insights from hundreds of GB of big data (Google N-gram project) by using statistical methods and NLP

Robert Bosch Engineering and Business Solutions, Bangalore
Software Engineer, Demand Forecasting Team, Bosch Corporate Research, February 2021- August 2021

- Developed a white-box time-series tool to predict the requirements of raw materials for manufacturing several months prior to its use; Worked on increasing repeatability, building intra-day and long-time period forecasting
- Built a model to predict defect percentage in deliveries made by vendors, using Decision Trees and Support Vector Machine

Software Engineer, Functional Safety – Powertrain, Customer Engineering Team, March 2019- February 2021

- Worked on software and firmware relating to functional safety of the vehicle. Was involved in writing impeccable code and rigorous testing of the developed modules under various circumstances. Ensured that the vehicle regressed to a recoverable safe state in the condition of a critical system failure every single time
- Led a team of 4 people in analyzing software requirement, documentation, distributing work and assisted them with design, code reviews and software testing. Collaborated with engineers from multiple teams to arrive at the most efficient solution for all requests raised by the automobile manufacturer
- Developed scripts for automation of CAN frames development; Reduced workload by an average of 12 hours per project configuration; Created scripts for automatically generating unit test cases for regression tests with only source code files as input
- Received the "Best Performer" award in 2019 and 2020 on two different teams

Young Leaders for Active Citizenship (YLAC), Bangalore
Mobility Champion, Campaign: #BengaluruMoving, July 2020 - September 2020

- Selected among 1100 applicants to participate in a paid advocacy campaign run by YLAC, the Department of Urban and Land transport, Karnataka and World Resource Institute, to help reduce traffic congestion in Bangalore
- Conducted effective research and gained successful outreach campaign techniques
- Collected and cleaned data; Analyzed citizen sentiment and behavior patterns through various social media platforms and presented the findings to the government, advocating for evidence backed decision making (i.e., increased cycling trails in Bangalore)

Smarterhomes Technologies, Bangalore
Hardware Design / Firmware Engineer, July 2018 - March 2019

- Led the new product portfolio team; Migrated the company's technology stack from GSM and WIFI to LoRa; Analyzed market requirement in Bangalore and created a range of LoRa based products
- Improved design of the PCB to remove parasitic current leakages and introduces a routine to use the low power core, reducing the sleep current of the meter to the lowest level possible in the industry (2uA)
- Proposed and implemented a 'Built in Self-Test' for existing meters to find faulty components and aid in quick replacements

Aquassure, Bangalore
Founder, November 2017 - July 2018

- Deeply concerned by the exorbitant shared water bill at my residence, I built an end-to-end business solution prototype for water usage and billing in apartment complexes using easily pluggable non-intrusive smart meters based on LoRa; Developed prototype dashboard for the customer to track daily usage patterns, check for leakage detection, enable remote valve operation, and raise alert in case of excessive water wastage
- Assumed a wide array of roles in the small team (i.e., pitching to potential investors, writing code, designing and fabricating circuit boards, addressing customer grievances, and more) as all aspects of the business were handled in-house

Birla Institute of Technology & Science (BITS) Pilani, India
Undergraduate Teaching Assistant, September 2016 – March 2017

- Lab Teaching Assistant for the course 'Microprocessor Programming and Interfacing'. Was involved with setting questions for the lab, grading and helped students' queries
- Awarded a monetary prize for being one of the best TAs in the course

Indian Institute of Science, Bangalore
Research Intern; Electrical Communication Engineering Dept – Undergraduate Thesis, June 2017 - December 2017

- Worked on *AMBULET* - a project aimed at providing high Quality of Service (QoS) on unreliable mobile telecom networks
- Developed a heuristic adaptive jitter buffer algorithm, by taking inspiration from video conferencing applications like Skype; Demonstrated the efficiency of the algorithm by showing difference in packet delay and loss patterns with and without the algorithm on a Constant Bit Rate application traffic

PROJECTS

Computational Content analysis (present)
Working on extracting data from various sources and different medium to study the relationship between polarization, demagoguery and content moderation on online platforms. I am particularly interested in the creation of closed-door echo chambers resulting from switching social media platforms and prevalence of targeted advertisements on these sites. Currently exploring techniques like Word Embeddings, Dependency Parsing, Network Analysis, topic modelling to study relevant discourse on the internet

Studying Internet Censorship in Turkmenistan (present)
Studying the extent of online censorship, and techniques used for the same in Turkmenistan. Gathered over 600 million website URLs to test censorship on and identified all relevant Autonomous Systems and DNS resolvers in the country. I am interested in finding out what websites are blocked and the relevance for blocking. Currently using keyword extraction and Regex matching to identify DNS manipulation on request. Other areas of interest include looking at HTTP injections, blocked pages, bandwidth throttling, Denial of Service, and content moderation (shadow-banning, blocking); also working on developing scripts to study these phenomenon

Interpretable Torque Model Using Symbolic Regression (2021, at Bosch)
Helped program a proof-of-concept functional expression for the engine torque of a diesel engine using genetic programming. Multi parameter optimization was performed to find model with least memory and computing demand while having good prediction accuracy. The developed model used combustion rate, ignition angle and drag to predict engine torque with 94% accuracy on the test data

Design and Implementation of a RISC-V Micro Controller (2017)
Designed the data-path and branch control decisions for an Out of Order instruction execution (OoO) micro-processor (based on the RISC-V ISA), taking inspiration from the Berkeley Out of Order Machine (BOOM) and the example processor on GEM5 and simulated it on the same.

Query Based Object Tracking System (2016)
Designed a query-based tracking system to find the exact location of 6 people limited to 6 classrooms, detected using wireless motes (localization and sensing). Custom routing algorithms and MAC protocols were designed in TinyOS and implemented on MicaZ and Telosb motes and triangulation techniques based on receiver signal strength (RSSI) were used for distance calculation. A web-based database was also maintained to record and update the dynamic movement of the tagged people

OTHER ACTIVITIES & HONORS

Maroon Scholar, University of Chicago, 2021-2022 (2/3 tuition waiver)
Research Intern (Volunteer), Randomized Control Trial on TB Patients, October 2019 - February 2020
Finalists – SpaceX Hyperloop challenge 2021, Hawthorne, CA (Only team from Asia)
Poster presentation at COMSNETS 2019
Top 10% (60% tuition waiver), BITS Pilani, 2017-2018