Tezan **Sahu**

DATA & APPLIED SCIENTIST

Microsoft, India

 (+91) 9022350789 | tezansahu@gmail.com | www.tezansahu.github.io | tezansahu | tezan-sahu

Work Experience

Data & Applied Scientist

MICROSOFT

Hyderabad

Jul 2021 - Present

- As a part of the Bing Autosuggest team, improve the diversity, coverage & quality of autosuggestions across 200+ countries in 100+ languages
- Leverage various data science & A/B experimentation techniques to innovate & evaluate solutions for enhancing suggestion relevance in Bing

Google Summer of Code 2020 Student Developer [Work Report]

PEcAn Project

Remote

Jun - Aug 2020

- Conceptualized & developed `rpecanapi`, an R package to leverage PEcAn's services without the overheads of connecting to the database
- Revamped & dockerized the PEcAn RESTful API to consist of all the endpoints which allow users to interact remotely with PEcAn servers

Data & Applied Science Intern

MICROSOFT

Remote

May - Jul 2020

- As a part of the Core Relevance team at Bing, developed a framework to automate the analysis of ranking techniques based on DCG Metrics
- Improved query reproducibility rate by 10 % and slashed the time taken to debug ranking techniques from a week to only a few hours
- Selected to present the project at Microsoft's Machine Learning & Data Science (MLADS) Synapse 2020 Conference *(41% acceptance rate)*

Smart Contract & DevOps Intern

WALLETSOCKET INC.

Remote

Dec 2019

- Successfully completed the development testing of smart contracts for Pay0K, a crypto payment processor that integrates a variety of merchants
- Configured Istio proxies to build a service mesh for the microservices deployed on Kubernetes to communicate by abstracting the network

Blockchain Engineering Intern

WANDX SOLUTIONS PVT. LTD.

Bengaluru

May - Jul 2019

- Fabricated a new Security Token standard around ERC721 tokens using IPFS for storing proofs, along with proof verification strategies
- Engineered smart contracts for implementing confidential transactions of fiat-backed stable coins using AZTEC protocol for WalletSocket Inc.
- Devised a solution for WandX Desktop Application by aggregating multiple cryptocurrency exchanges to display best trades to the user

Backend Developer

ENCORO SOLUTIONS PVT. LTD.

Mumbai

Jan - Mar 2019

- Formalized and implemented the mathematical model to figure out key nodes in an organization as part of Social Network Analysis
- Analysed and evaluated the model to suggest the incorporation of various new parameters to improve the model

Blockchain Research Intern

DUNYA LABS (INDIA) PVT. LTD.

Bengaluru

Dec 2018

- Examined block data worth several days to formulate and test metrics for the middleware being developed on the EOS Blockchain
- Explored the working and applications of Zero-Knowledge Proof Systems such as SNARKs, STARKs and Bulletproofs on various blockchains
- Brainstormed about middlewares and services that could be built on top of upcoming blockchains such as Dfinity and Polkadot

Education

IIT Bombay

B.TECH. IN MECHANICAL ENGINEERING WITH MINOR IN COMPUTER SCIENCE AND ENGINEERING

CPI: 9.90

2017 - 21

Jaipuriar School

INTERMEDIATE/+2

96.2%

2017

St. Mary's ICSE School

MATRICULATION (ALL INDIA RANK - 1)

99.2%

2015

Key Projects

Lookup or Exploratory: What is Your Search Intent? [Paper]

UNDER THE GUIDANCE OF DR. MANOJ AGARWAL (MICROSOFT)

Research Project

Jun 2020 - May 2021

- Fine-tuned a transformer-based model to classify specificity of search queries into *exploratory* or *lookup* using augmented triplet loss function
- Achieved an accuracy of 80.25% & an F1 Score of 0.8321 on queries from actual Bing logs without the usage of session-related information
- Proposed a Semi-Greedy Iterative Training algorithm to improve the model accuracy to 87% using pseudo-ground truths
- Presented at Machine Learning & Data Science (Synapse) Conference 2020 | Published in Microsoft Journal for Applied Research (MSJAR) 2021

Travelling Salesman Problem: Parallel Implementations & Analysis [View]
ME, IIT Bombay

HIGH PERFORMANCE SCIENTIFIC COMPUTING COURSE PROJECT UNDER PROF. S. GOPALAKRISHNAN   *Mar - May 2021*
- Investigated & compared various paradigms of parallelization by implementing Brute Force TSP solution using OpenMP, MPI & CUDA (for GPUs)
- Contrasted OpenMP & MPI implementations using parallelization efficiency & Karp-Flatt Metric | Verified the extent of speedup for CUDA
- Quantitatively deduced the imperative need to choose an efficient algorithm to solve a problem instead of parallelizing an inefficient algorithm

WAVS: Web App Vulnerability Scanner [View]
CSE, IIT Bombay

FOUNDATIONS OF NETWORK SECURITY AND CRYPTOGRAPHY COURSE PROJECT   *Feb - Apr 2021*
- Developed a tool to perform inline vulnerability scan for a website given its URL & display the detailed results in the form of a dashboard
- Modularized the server code to analyse the status of SSL/TLS certificates, XSS, open redirection & potential phishing issues on the website
- Created a proxy to intercept & modify requests from the browser and also inject the scan results into the templatized dashboard

McDefect Solutions: AI-Powered Manufacturing Quality Inspection [Demo] [View]
ME, IIT Bombay

ENGINEERING DATA MINING & APPLICATIONS COURSE PROJECT UNDER PROF. ASIM TEWARI   *Oct - Dec 2020*
- Customized AI-powered defect detection & classification solutions for manufacturing industries to improve the production efficiency
- Trained a RetinaNet-based Object Detection Model & VGG-based models for defect detection using transfer learning to achieve 98% accuracy
- Created the website, demo portal & RESTful API server for deployment, along with enabling auto-documentation for the project

zkCompound: Privacy-Preserving Compound Lending on Ethereum [View]
Hackathon Project

HACK INOUT 6.0, BENGALURU   *Oct 2019*
- Innovated a novel solution using zero-knowledge to achieve complete verifiable privacy while performing compound lending & borrowing
- Overhauled the Compound Finance Protocol smart contracts to integrate the zero-knowledge proofs verification offered by AZTEC Protocol
- Designed an aesthetically pleasing front-end for the application to make end-user experience as intuitive & seamless as possible

TEXTURify: Cross-Platform Application for Image Quilting [View]
CSE, IIT Bombay

DIGITAL IMAGE PROCESSING COURSE PROJECT UNDER PROF. AJIT RAJWADE   *Sep - Oct 2019*
- Obtained convincing results by implementing the Image Quilting techniques for Image Texture Synthesis & Transfer [based on this work]
- Fabricated a cross-platform application around the implementation using Ionic & FastAPI to transfer desired textures onto target images

Excalibur: Ethereum-Based Voting Solution [Demo] [Presentation]
Hackathon Project

MICROSOFT CODEFUNDO++, IIT BOMBAY   *Aug 2019*
- Conceptualized an end-to-end Decentralized Voting Solution to organize secure, reliable and transparent elections using Azure Blockchain
- Applied the concepts of cryptography to ensure anonymity of voters on a public blockchain during the election, yet making the votes verifiable
- Constructed the front-end for the decentralized application using Angular | Implemented the service to encrypt and decrypt votes using Python

Waffle-CLI: An Explorer for Ethereum [View]
Hackathon Project

BEYOND BLOCKCHAIN HACKATHON, GITCOIN   *Jul 2019*
- Developed a CLI tool, similar to Ethereum block explorer, curated for developers to monitor smart contracts, transactions & events
- Enabled custom filtering of transactions and events based on function signatures and local timestamps, along with ENS Domain resolution

Other Projects

KMR: Digital Repository for Document Storage │ CorpComp, TechFest 2020	[View]	Feb-Mar 2021
Athena: Playground for Visualizing Computer Graphics Curves │ Hobby Project	[View]	Feb 2021
Smart UI: Generating JSON & HTML from Wireframes │ Smart UI Hackathon, TechFest 2020	[View]	Jan 2021
HumanChain: Volunteering & Donation Platform during COVID-19 │ COVID-19 Global Hackathon 1.0	[Demo]	Mar-Apr 2020
Berkeley Clock Synchronization Algorithm │ Principles of Concurrent & Parallel Programming Course Project	[View]	Sep-Oct 2019
LendZ: Zero Knowledge Loans on Ethereum │ ETHIndia Hackathon 2.0	[Code]	Aug 2019
Pay-No-Load: A Plugin for the Aleth.io Ethereum Lite-Explorer │ Beyond Blockchain Hackathon	[View]	Jul 2019
Attendance System using Face Recognition │ Institute Technical Summer Project	[Video]	May-Jul 2018

Achievements

SCHOLASTIC

May 2021	**Academically Outstanding Student Award,** Mechanical Engineering Department Awards 2021	*IIT Bombay*
2019-21	**Institute Rank 2,** Indian Institute of Technology Bombay	*IIT Bombay*
2018-21	**Department Rank 1,** Mechanical Engineering Department	*IIT Bombay*
2017-21	**AP (Advanced Performer) Grade in 4 courses,** Awarded to top 1% students in a course	*IIT Bombay*
2020-21	**O.P. Jindal Engineering and Management Scholarships (OPJEMS) Scholarship,** O. P. Jindal Group	*India*
2015	**All India Rank 1,** ICSE Board Examination, among 0.16 million students	*India*

Technical

Q2 2021-22	**Award for Excellence - Innovation**, Search Technology Center India (STCI), Microsoft	*Hyderabad*
Mar 2021	**1st Place**, Smart UI Hackathon, TechFest 2020	*Online*
Aug 2020	**Institute Technical Color**, Institute Student Technical Awards 2019-20	*IIT Bombay*
Feb 2020	**Winner**, I_Hack Blockchain Track, E-Summit 2020	*IIT Bombay*
Aug 2019	**1st Place**, Microsoft CodeFunDo++ Institute-Wide Hackathon	*IIT Bombay*
Aug 2019	**Winner**, ETHIndia Hackathon 2.0 **[Also won API Prizes of AZTEC Protocol, Lendroid & Matic Network]**	*Bengaluru*
Jul 2019	**1st Place**, Aleth.io Lite Explorer Freestyle Track, Gitcoin Beyond Blockchain Hackathon	*Online*
Jul 2019	**2nd Place**, Aleth.io API Freestyle Track, Gitcoin Beyond Blockchain Hackathon	*Online*
2018-19	**Special Mention**, Hostel 3 Technical Awards	*IIT Bombay*
Aug 2018	**Top Hack Prize**, Lendroid track, ETHIndia Hackathon	*Bengaluru*

Positions of Responsibility

Institute System Administrator $\hfill$ *IIT Bombay*
Hostel Affairs Council $\hfill$ *Jun 2020 - May 2021*
- Lead a 12-member SysAd team as the interface between IIT Bombay Computer Center and students across the institute
- Responsible for maintenance and upkeep of servers in the student data center, ensuring their smooth functioning & minimal downtime
- Developed & maintained the Application Management System (AMS) to digitize the process of filling, signing & approving institute-related forms

Overall Coordinator, Developers' Community $\hfill$ *IIT Bombay*
Institute Technical Council $\hfill$ *Jun 2020 - May 2021*
- Spearheaded the community of software developers at IIT Bombay with a 3-tier student technical team to accomplish several projects
- Brainstormed & contributed towards developing the Resume Verification Portal, Games Portal, Tech Projects & Funds Management Portal

Convener $\hfill$ *IIT Bombay*
The Web and Coding Club, Institute Technical Council $\hfill$ *Apr 2018 - Mar 2019*
- Organized and spoke at sessions on Web Scraping, Game development, Version Control, Open Source and Blockchain Essentials
- Contributed towards developing and maintaining the website for Inter IIT Tech Meet 2018, held at IIT Bombay
- Conceptualized and co-founded the Blockchain@IITB Circle to promote and encourage blockchain research and development in the campus

Web and Marketing Coordinator $\hfill$ *IIT Bombay*
The Entrepreneurship Cell $\hfill$ *Mar 2018 - Feb 2019*
- Managed the organizing team for I_Hack, E-Summit 2019, reaching out to 50+ companies and 500+ hackers **|** Supervised all on-ground execution
- Contacted 200+ companies to explore new synergies for Eureka! 2018 and E-summit 2019, ensuring completion of all promised deliverables
- Mentored 20 freshmen in case study solving, business model canvas filling and pitch deck making during EnB Buzz at IIT Bombay

Certifications

Jul 2020	**DevOps Culture & Mindset** [View]	*University of California, Davis	Coursera*
Apr 2020	**Reinforcement Learning Explained** [View]	*Microsoft	edX*
Apr 2020	**Natural Language Processing** [View]	*Microsoft	edX*
Jul 2018	**Blockchain Fundamentals Training** [View]	*Blockchain Semantics*
May 2018	**Machine Learning Specialization** [View]	*University of Washington	Coursera*
Apr 2018	**Certified Marketing Analytics Practitioner**	*Henry Harvin Education*

Extracurricular Activity

Cultural Activities	• Started a YouTube Channel, with covers & lyric videos for songs, reaching ~ 2000 views • Conducted 3 solo painting exhibitions featuring 101, 135 and 68 paintings • Excelled in Elementary and Intermediate Drawing Grade Examinations with an A Grade • Secured International Best Prize at UNICEF's Japan International Painting Competition 2014 • Completed 3rd Year in Hindustani Classical Vocals
Sports	• Successfully completed one year of Squash under National Sports Organization (NSO) • Represented the school in Inter-District Hockey and Table Tennis tournaments
Miscellaneous	• Mentored 25+ students across ITSP (2020), Summer of Science (2019 & 2020), Seasons of Code (2020 & 2021) • Designed a manually controlled car for XLR8 Competition, capable of negotiating obstacles on a designated track • Finalist of the personality contest at Cascade 2014, one of the biggest inter-school fests in Mumbai