

# Tezan Sahu

FINAL YEAR UNDERGRADUATE

IIT Bombay, India

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## Education

### IIT Bombay

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

CPI: 9.90

2017 - 21

### Jaipuria School

96.2%

INTERMEDIATE/+2

2017

### St. Mary's ICSE School

99.2%

MATRICULATION (ALL INDIA RANK - 1)

2015

## Work Experience

### Google Summer of Code 2020 Student Developer [Work Report]

Remote

#### PECAN PROJECT

Jun-Aug 2020

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

### Data & Applied Science Intern

Remote

#### MICROSOFT

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
- Increased the query reproducibility by 10 % and aided in slashing 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

Remote

#### WALLETSOCKET INC.

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

Bengaluru

#### WANDX SOLUTIONS PVT. LTD.

May-Jul 2019

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

### Backend Developer

Mumbai

#### ENCORO SOLUTIONS PVT. LTD.

Jan-Mar 2019

- Aided in formalizing and implementing the mathematical model to figure out the 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

Bengaluru

#### DUNYA LABS (INDIA) PVT. LTD.

Dec. 2018

- Analyzed 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

## Key Projects

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

Research Project

UNDER THE GUIDANCE OF DR. MANOJ AGARWAL (MICROSOFT)

Jun 2020 - Present

- Developed a transformer-based model to classify the intent specificity of search queries using an augmented triplet loss function
- Achieved an accuracy of 80.25% & an F1 Score of 0.8321 on queries from actual Bing logs without any session-related information
- Proposed a Semi-Greedy Iterative Training algorithm to improve the model accuracy to 87% using pseudo-ground truths
- Selected to be 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

- Explored & 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, and investigated 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 templated 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

- Created customizable 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
- Developed 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

- Developed a novel solution using zero-knowledge to achieve complete verifiable privacy while performing compound lending & borrowing
- Revamped 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

Sept - 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

- Developed 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
- Designed the front-end for the decentralized application using Angular and developed the service to encrypt and decrypt votes using Python

## Waffle-CLI: An Explorer for Ethereum [\[View\]](#)

Hackathon Project

BEYOND BLOCKCHAIN HACKATHON, GITCOIN

Jul 2019

- Created a CLI tool, similar to an Ethereum block explorer, curated for developers to monitor smart contracts, transactions and events
- Enabled custom filtering of transactions and events based on function signatures and local timestamps, along with ENS Domain resolution

## Other Projects

### SOFTWARE DEVELOPMENT RELATED

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

### MECHANICAL ENGINEERING RELATED

<b>FMS &amp; their Analysis using FlexSim®</b>   Computer Integrated Manufacturing Course Project	<a href="#">[Report]</a>	Jan-Apr 2021
<b>Aqu-a-drift Solutions : Modular Floating Settlements</b>   Machine Design Course Project	<a href="#">[Video]</a>	Aug-Nov 2020
<b>Investigation of Geyser Phenomenon in a Vertical Cryogenic Pipe</b>   Cryogenic Engineering – I Course Project	<a href="#">[View]</a>	Feb-Apr 2020
<b>Cryogenic Machining: Simulation &amp; Analysis</b>   Manufacturing Processes - II Course Project	<a href="#">[View]</a>	Sep-Nov 2019

## Achievements

### SCHOLASTIC

May 2021	<b>Academically Outstanding Student Award</b> , Mechanical Engineering Department Awards 2021	IIT Bombay
2018-21	<b>Department Rank 1</b> , Mechanical Engineering Department	IIT Bombay
2019-21	<b>Institute Rank 2</b> , Indian Institute of Technology Bombay	IIT Bombay
2020-21	<b>O.P. Jindal Engineering and Management Scholarships (OPJEMS) Scholarship</b> , O. P. Jindal Group	India
2015	<b>All India Rank 1</b> , ICSE Board Examination, among 0.16 million students	India

## TECHNICAL

Mar 2021	<b>1st Place</b> , Smart UI Hackathon, TechFest 2020	Online
Aug 2020	<b>Institute Technical Color</b> , Institute Student Technical Awards 2019-20	IIT Bombay
Feb 2020	<b>Winner</b> , I_Hack Blockchain Track, E-Summit 2020	IIT Bombay
Aug 2019	<b>1st Place</b> , Microsoft CodeFunDo++ Institute-Wide Hackathon	IIT Bombay
Aug 2019	<b>Winner</b> , ETHIndia Hackathon 2.0 <b>[Also won API Prizes of AZTEC Protocol, Lendroid &amp; Matic Network]</b>	Bengaluru
Jul 2019	<b>1st Place</b> , Aleth.io Lite Explorer Freestyle Track, Gitcoin Beyond Blockchain Hackathon	Online
Jul 2019	<b>2nd Place</b> , Aleth.io API Freestyle Track, Gitcoin Beyond Blockchain Hackathon	Online
2018-19	<b>Special Mention</b> , Hostel 3 Technical Awards	IIT Bombay
Aug 2018	<b>Top Hack Prize</b> , Lendroid track, ETHIndia Hackathon	Bengaluru

## Positions of Responsibility

### Institute System Administrator

IIT Bombay

HOSTEL AFFAIRS COUNCIL

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

IIT Bombay

INSTITUTE TECHNICAL COUNCIL

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

IIT Bombay

THE WEB AND CODING CLUB, INSTITUTE TECHNICAL COUNCIL

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

IIT Bombay

THE ENTREPRENEURSHIP CELL

Mar 2018 - Feb 2019

- Led the organizing team for I\_Hack Hackathon, E-Summit 2019, reaching out to 50+ companies and 500+ hackers
- 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	<b>DevOps Culture &amp; Mindset</b> <a href="#">[View]</a>	University of California, Davis   Coursera
Apr 2020	<b>Reinforcement Learning Explained</b> <a href="#">[View]</a>	Microsoft   edX
Apr 2020	<b>Natural Language Processing</b> <a href="#">[View]</a>	Microsoft   edX
Jul 2018	<b>Blockchain Fundamentals Training</b> <a href="#">[View]</a>	Blockchain Semantics
May 2018	<b>Machine Learning Specialization</b> <a href="#">[View]</a>	University of Washington   Coursera
Apr 2018	<b>Certified Marketing Analytics Practitioner</b>	Henry Harvin Education

## Extracurricular Activity

### Cultural Activities

- Started a [YouTube Channel](#), with covers & lyric videos for songs, reaching ~ 2000 views
- Bagged the 3<sup>rd</sup> position in Inter Hostel Music Challenge (Vocals) 2021
- 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 3<sup>rd</sup> 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