

# Aditya Kumar Bej

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## AREAS OF INTEREST

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Software Engineer with 4 years of experience in full-stack development and architecture and implementation of distributed computational systems. Areas of interest lie in the field of Software Engineering, Machine Learning, Blockchain and System Design and Architecture

## EDUCATION

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### University of California, Davis

*Master's in Computer Science GPA: 3.92*

Davis, California

*June. 2024*

### SRM Institute of Science and Technology

*Bachelor of Technology in Electronics and Communications; GPA: 4.00*

Chennai, TamilNadu

*May. 2014 – June. 2018*

## PROGRAMMING SKILLS

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**Languages:** Java, Python, Javascript/Typescript, C/C++, MATLAB, Bash

**Operating System:** Linux (Ubuntu and CentOS), MacOS and Windows

**Databases:** DynamoDB, PostgreSQL, MongoDB, RocksDB

**Tools/Frameworks:** AWS (Lambda, S3, EC2, Fargate, Sagemaker) Docker, Kubernetes, Jenkins, Git, Node, React and Express, Springboot, Flask/FAST API, Insomnia, POSTMAN, LaTeX

**Communication Protocols:** TCP/IP, UDP, Websockets, CCSDS

## PROFESSIONAL EXPERIENCE

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### Autodesk

*Security Software Engineer Intern*

San Francisco, California

*June 2023 - Present*

- **Team:** Part of the Trust Security team which scales Autodesk's security program.
- **Domain:** Security
- **Project works:** Working in building various security tools, application security for a variety of Autodesk products, security automation, DevSpecOps, AWS development and architecture design.
  - **ETL** -Developing code for performing ETL (Extract, Transform, and Load) operations from various security vendors of multiple applications and exposing data for application vendors for security checks, health management of their applications. **Tech stack** - Python, AWS, DynamoDB, Terraform, Docker, Jenkins.

### Broadridge Financial Solutions

*Senior Member Technical - Blockchain Developer*

Bangalore, Karnataka

*Feb 2021 - August 2022*

- **Team:** Worked in the Blockchain Research and Development Team for developing blockchain solutions and smart contracts.
- **Domain:** Knowledgeable in Blockchain based solutions with market research knowledge on the same, Crypto-currency and other various implemented Distributed Ledger Technologies.
- **Project works:** Responsible for architecting and building various Proof of Concept applications, managing them all the way from MVP to Production-ready. Few of the projects include:
  - **GrowthStation** - An application developed for Financial Advisors to nurture relationships with their potential contacts with custom automated workflows. Heavy Integration with third party services such as SendGrid, Calendly, Zoom etc. for more powerful workflows. **Tech stack** - Node, React, Typescript (Next.js framework), Docker, EC2s, Amazon RDS (PostgreSQL), Python (FastAPI)
  - **Intelligent Document Processing** - Machine Learning project built with Amazon Comprehend and Natural Learning Processing (NLP) algorithms to identify and annotate keywords in a PDF. Users can modify/add annotations for manual training of the ML algorithm using an intuitive frontend system. **Tech stack** - Machine Learning, NLP, Javascript (frontend), AWS-EC2s, S3s, Lambda functions

- **CapTable** - Full stack application with Blockchain as the ledger and smart contracts governing various business logics. Highly scalable for small to medium sized companies to handle their investments and shares with a visually powerful frontend. **Tech stack** - Symbiont Blockchain, Node, React, Javascript, Python (for smart contracts), Docker and Kubernetes (Devops), MongoDB.
- **ASX Off Market Transfer** - A trading application used in the Australian Stock Exchange market for off-market transfers. Used to transfer a holding of shares from one party to another without buying or selling on the market. **Tech stack** - Digital Asset Modelling Language Blockchain, Node, React, Springboot, DAML (Digital Asset Modelling Language for ledger), Postgres.

## TeamIndus

Ground Systems Software Developer

Bangalore, Karnataka

Oct 2020 - Jan 2021

- **Team:** Worked as part of the Ground Software team with ex-Indian Space Research Organisation (ISRO) and European Space Agency (ESA) scientists to develop the software used in the ground systems to provide an interface between the Lunar Rover in Space and operator in Earth.
- **Domain:** Knowledgeable in the end to end Mission Planning/Operations and all flight sub-systems of cis/trans-lunar space launch missions.
- **Project works:** Led a team of five developers to build a Ground Software Application capable of processing and sending telemetry parameters and commands to the Lunar Rover in integration with other sub-systems such as Thermal, Flight Systems, Electrical, Guidance, Navigation and Control:
  - **Ground Software** - Used YAMCS (Yet Another Mission Control Software) framework to develop the ground software application. The backend system processes the telemetry parameters and has command generation and queuing logic to send commands to the Rover and ability to upload custom Mission Control rules. The frontend is used to display the near-realtime telemetry data received from the rover and send commands with a user-friendly UI. **Tech stack** - Java-maven, Springboot, Python, React.js, TCP/UDP and CCSDS network protocols.

## Ernst & Young

Associate Software Engineer

Bangalore, Karnataka

Nov 2018 - Sep 2020

- **Team:** Worked as part of the Banking domain for Morgan Stanley and Insurance Domain in Guidewire Development in an Agile based environment.
- **Domain:** Knowledgeable in the Insurance and Banking domains. Worked in the Guidewire Application for the Insurance domain, Capital Markets and Wealth Asset Management in the Banking domain.
- **Project works:**
  - **Order History** - Developed the Frontend and Backend for an Order History Application which displays the orders post settlement. The orders include Equity, Syndicate, Mutual Funds, Options. Developed Trade order conversion algorithms to analyze, enhance and manipulate big data to be displayed in the application. Worked with analysing and manipulating sensitive financial data in Morgan Stanley's Enterprise Data Warehouse. **Tech stack** - Hadoop, Java, Apache SOLR, Angular.
  - **Guidewire** - Worked in the Insurance team on the Guidewire product to create custom scripts for the Policy, Billing and Claim center. **Tech stack** - Java (GOSU), Guidewire.

## RESEARCH EXPERIENCE

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### ExpoLab - ResilientDB (Blockchain)

March 2023 - Present

Working at ExpoLab as a researcher working on developing applications on ResilientDB which is a **High Throughput Yielding Permissioned Blockchain Fabric** founded by ExpoLab at UC Davis in 2018. Currently working in developing a NFT (Non-Fungible Token) full-stack application in MERN stack and utilizing Resilient DB in the persistence layer. ([expolab.org](https://expolab.org))

## DNA Sequence Classification using Machine Learning

Oct 2022 - Dec 2022

Designed multiple Machine Learning models using different data processing techniques to successfully classify DNA sequences, and conducted a comparative study over different supervised techniques. Data processing techniques used are One-hot encoding, Sequence to vector (Seq2Vector) and K-mer encoding. Classifier Models architected, developed and trained are K-nearest neighbors, Decision Trees, Random Forest, Adaboost, Simple CNN and Embedded CNN. **The novel CNN model achieved over 80% accuracy** using both -one-encoded and vectorized sequences. Data set used - DNA sequences from the genomic profile of H3K79 tri-methylation in yeast, gathered by Dmitry K. Pokholok at Illumina.

([github.com/AdityaKumarBej/DNASequenceClassifier](https://github.com/AdityaKumarBej/DNASequenceClassifier))

## RadBid - Blockchain based e-auction system

Oct 2022 - Dec 2022

Proposed, architected and developed a decentralized full-stack e-auction application called RadBid with blockchain as a ledger. Frontend and middleware built with React and Node and the Blockchain tech used was Radix which uses Scrypto as the smart contract language. Scrypto is an asset-oriented programming language for Decentralized Finance applications. **Awarded with the top project** in the class ECS 265 under professor Mohammad Sadhogi. ([adeptness-cautious.github.io](https://adeptness-cautious.github.io))

## Study of Browser Extension Ecosystem - Manifest v43

Jan 2022 - Mar 2023

An Implementation of Neural Collaborative Filtering Models for Recommender Systems with emphasis on Implicit Data. Dataset: Movielens (100k: default, 1M can also be used). The key idea is to learn user-item interactions using neural network and predict the rating of unrated movies. Packages used - **python, keras, tensorflow, theano**. ([github.com/AdityaKumarBej/Neural-Movie-Recommendation-System](https://github.com/AdityaKumarBej/Neural-Movie-Recommendation-System))

## Neural Collaborative Filtering (NCF) Model

Nov 2021 - Dec 2021

An Implementation of Neural Collaborative Filtering Models for Recommender Systems with emphasis on Implicit Data. Dataset: Movielens (100k: default, 1M can also be used). The key idea is to learn user-item interactions using neural network and predict the rating of unrated movies. Packages used - **python, keras, tensorflow, theano**

[github.com/AdityaKumarBej/Neural-Movie-Recommendation-System](https://github.com/AdityaKumarBej/Neural-Movie-Recommendation-System)

## Mind Controlled Wheelchair

Dec 2017 - May 2018

Developed a cost-effective working prototype of a Mind Controlled Wheelchair. Researched about brain wave acquisition using EEG Headset, Sensory processing and actuation systems, Embedded C, Signal acquisition and processing using MATLAB, Andriod based operations interface using JavaScript. Achieved efficient hit rate probabilities of wheelchair movement from the extracted brain wave frequencies. Paper published in the **Journal of Advanced Research in Dynamical and Control Systems (Issue: 05-Special, Year: 2018, Pages: 941-944)**