# JAY GALA

jaygala24@gmail.com jaygala24.github.io github.com/jaygala24

## EDUCATION

**Dwarkadas J. Sanghvi College of Engineering (University of Mumbai)** *2017 - 2021*
Bachelor of Engineering (B.E.) in Computer Engineering Overall GPA: **9.86/10**
Applied Mathematics, Discrete Mathematics, Algorithms, Databases, Machine Learning, Artificial Intelligence, Natural Language Processing

## RESEARCH EXPERIENCE

**Research Collaboration** Sep 2021 - Present
*Independent Researcher (Remote)* *Advisor: Zeerak Talat*

- Identify real-world representations of overt hate speech on different non-iid datasets using Federated Learning.
- Extension to the cross-dataset model generalization by Fortuna et al. for hate speech detection.
- Experiments include LSTM, AWD-LSTM, DistilBERT, RoBERTa and FNet in central and federated setting.

**University of California San Diego** Jun 2021 - Present
*Research Intern (Remote)* *Advisor: Prof. Pengtao Xie*

- Working on applying human learning skills, specifically *learning from mistakes*, as an extension to Skillearn.
- Built efficient optimization algorithms for Neural Architecture Search adopting an importance weighting strategy.
- Experimental results outperform DARTS, P-DARTS, and PC-DARTS on CIFAR and ImageNet.

## RESEARCH & PUBLICATIONS

*Publications available at Google Scholar*

[1] **Jay Gala** and Pengtao Xie, "Learning from Mistakes based on Class Weighting with Application to Neural Architecture Search," *ArXiv*, vol. abs/2112.00275, 2021.

[2] **Jay Gala**, Hrishikesh Shenai, Pranjal Chitale, Kaustubh Kekre, and Pratik Kanani, "Improving Image-Based Dialog by Reducing Modality Biases," in *International Conference on Advances in Computing and Data Sciences*, pp. 33–41, Springer, 2021.

[3] Hrishikesh Shenai*, **Jay Gala***, Kaustubh Kekre*, Pranjal Chitale*, and Ruhina Karani*, "Combating COVID-19 using object detection techniques for next-generation autonomous systems," in *Cyber-Physical Systems: AI and COVID-19*, ch. 4, Elsevier Science, 2021.

[4] Pranjal Chitale*, Kaustubh Kekre*, Hrishikesh Shenai*, Ruhina Karani*, and **Jay Gala***, "Pothole Detection and Dimension Estimation System using Deep Learning (YOLO) and Image Processing," in *2020 35th International Conference on Image and Vision Computing New Zealand (IVCNZ)*, pp. 1–6, 2020.

[5] Dev Savla, Amogh Parab, Kaustubh Kekre, **Jay Gala**, and Meera Narvekar, "IoT and ML based Smart System for Efficient Garbage Monitoring: Real Time AQI monitoring and Fire Detection for dump yards and Garbage Management System," in *2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT)*, pp. 315–321, 2020.

[6] Dev Savla, Amogh Parab, Kaustubh Kekre, **Jay Gala**, S. Ramchandra, and Pankaj Sonawane, "Virtual Farmer: Real Time Crop Prediction and Automatic Irrigation System," in *2020 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT)*, pp. 1–5, 2020.

## WORK EXPERIENCE

**Unicode** Aug 2018 - Jun 2021
*Web Developer & Student Mentor*

- Mentored a team of sophomores on projects such as Inventory Management, Masters and Placement Portals.
- Conducted workshop on web development and open-source development for over 100 students in the college.

**Tata Consultancy Services** Dec 2019 - Feb 2020
*Machine Learning Intern*

- Developed models using VAEs and K-means clustering for customer behavior analysis to prevent customer churn.
- Prepared a custom dataset by developing surveys to handle open-ended and closed-ended questions.
- Extracted feedback responses from handwritten survey forms using OCR achieving 12% CER and 18% WER.

**Ucadd EdTech** Dec 2018 - Aug 2019
*Web Developer (Remote)*

- Built a learning platform with support for content streaming, adaptive assessments, doubt-solving, etc using MERN stack.
- Worked on optimizing lecture streaming with limited data bandwidth from hosting providers such as Vimeo.
- Spearheaded data analytics to generate useful insights about the courses for instructors based on user interactions.

**Sensum Fintech** Jan 2019 - Feb 2019
*Web Developer*

- Constructed visualization graphs using plotly to show and analyze the trends in the finance trading markets.
- Integrated backend APIs for stock recommendations and improved user experience by optimizing the builds.

## PROJECTS

**Ocubot - Image-based Dialog** *Advisor: Prof. Pratik Kanani*

- B.E. project on building a conversational dialog system about visual information in an image (Visual Dialog).
- Incorporate coreference resolution using attention over dialog history to have more natural conversations.
- Reduced modality biases by improving visual context with dense captions and attention over these captions.

**Anomaly Detection in ECG Signals** *Advisor: Prof. Pratik Kanani*

- Industry collaboration to develop neural models for detecting anomalies in processed ECG signals from IoT devices.
- Applied distributed computing algorithms for speed improvements during inference and load balancing by 60%.

**Annotated PyTorch Paper Implementations** *View*

- Annotated PyTorch implementations of deep learning papers as interactive jupyter notebooks.
- Includes papers such as Word2Vec, GloVe, KimCNN, Bahdanau Attention, Transformer, etc.

**C Programming Exam Portal** *View*

- A paperless solution for conducting C programming exam for over 500 students at D. J. Sanghvi.
- Generated data-driven detailed reports for students and instructors to enhance the overall learning experience.

## SKILLS

| | |
|---|---|
| **Languages** | Python, C, Java, JavaScript, SQL, HTML5 |
| **Databases** | MySQL, SQLite, PostgreSQL, MongoDB |
| **Libraries and frameworks** | PyTorch, Keras, Scikit-learn, NumPy, Pandas, OpenCV, Gensim, SpaCy, NLTK, Flask, FastAPI, Streamlit, ReactJs, NodeJs |
| **Others** | Git, Jupyter, Docker, Raspberry Pi, LaTeX |

## CO-CURRICULAR ACTIVITIES

1. **Teaching Assistant** for an undergrad-level Machine Learning Course - UMLSC, supported by **Google Research India**
2. Member of Shalizi–Stats reading group which focuses on the stats book Advanced Data Analysis from an Elementary Point of View by Cosma Shalizi and Bayesian Statistics.
3. Working on identifying the causal effects of non-expert mentors on the careers of the mentee (students) in educational institutions as a part of **Unicode Research Group**
4. Presented machine learning paper reviews in the Unicode Research Group and ML Collective