Mansi Khamkar

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Education

Program	Institution	%/CGPA	Year
M.Tech. (Computer Science and Engg)	IIIT, Hyderabad	8.82	2022
B.E. (Computer Engineering)	VESIT, Mumbai University	8.05	2019
Diploma (Computer Engineering)	VESP, Mumbai	87.94	2016
Xth Std. (Maharashtra State Board)	Loreto Convent School, Mumbai	89.23	2013

Publications

- **"Wisdom of (Binned) Crowds: A Bayesian Stratification Paradigm for Crowd Counting"**, Sravya Vardhani Shivapuja, **Mansi Pradeep Khamkar**, Divij Bajaj, Ganesh Ramakrishnan*, Ravi Kiran Sarvadevabhatla*; In proceedings of the 2021 ACM Conference on Multimedia. [* - Mentor]
  - Highlighted the issues with training and evaluation of crowd counting deep networks till date, which report only MAE but ignore the standard deviation which is large even in the case of SOTA networks.
  - Proposed a modified crowd counting pipeline that involves partitioning the count range into bins optimal for uniform sampling and minibatch creation, by employing Bayesian stratification approach to alleviate the effect of heavy tailed dataset distribution.
  - Proposed a novel bin sensitive loss function to incorporate decrease of variance at each training step and suggested a new evaluation metric.
- **"Stutter Diagnosis and Therapy System based on Speech Processing and Deep Learning"**, Gresha Bhatia*, Binoy Saha, **Mansi Khamkar**, Ashish Chandwani, Reshma Khot; In 13th INDIACom-2019, 6th International Conference on Computing for Sustainable Global Development. [* - Mentor]
  - Attempted to detect and classify stutters in the input audio while existing works focused only on detection of stutters. Trained a Gated Recurrent CNN on MFCC audio features for stutter detection and classification.
  - Proposed an SVM-based system that can suggest therapies based on the type and severity of the stuttering.
  - Enhanced the dataset by manually extracting and segregating audio chunks into various stutter categories along with stutter severity.

Work Experience

Research Assistant **Dec'20 - Aug'21**
Deep Learning, Computer Vision *Center for Visual Information Technology, IIIT-Hyderabad*

- Worked under the guidance of Prof. Ravi Kiran Sarvadevabhatla and Prof. Ganesh Ramakrishnan on devising and evaluating approaches for crowd counting in images.
- Implemented the proposed variance reduction crowd counting pipeline along with the novel bin-sensitive loss function and new data augmentation techniques; and conducted experiments on the SOTA counting networks.

Application Development Associate **Aug'19 - Mar'20**
ETL Development *Accenture, Mumbai*

- Worked on ETL tools - AbInitio, Talend, Informatica and developed plans to process/load/update the insurance data in the warehouse.
- Created scripts and real-time jobs for data-load as well as admin task automation and followed agile project management methodology using Rally tool.

Software Engineering Intern **Aug'17 - Nov'17**
Full-stack Web Development *Reis (Startup), Mumbai*

- Developed a full-fledged responsive website for online food ordering having content management system and kitchen inventory management system.
- Designed database schema, implemented App shell architecture and lazy loading for performance optimization and performed on-site Search Engine Optimization.

Web Developer **Sep'16 - May'17**
Web Development, Event Management *Computer Society of India - VESIT, Mumbai*

- Developed the official website for CSI-VESIT using Laravel framework for managing online event registrations.
- Co-ordinated and executed technical as well as non-technical events organized by the council.

Key Projects

Stutter Diagnosis and Therapy System **Jun'18 - Apr'19**
Deep Learning Model, Android App *VESIT, Mumbai*

- Developed an Android application for stutterers under the guidance of a speech therapist, that diagnoses the type and severity of stutter and recommends speech therapies.
- The app exploits CNN followed by GRUs to detect disfluencies in recorded speech and uses SVM to suggest the best therapies based on the user's monitored performance

Wikipedia Search Engine **Aug'21 - Sep'21**
Indexing and Ranking Application *IIIT, Hyderabad*

- Built a scalable and efficient search engine on large Wikipedia dump of size around 80GB. Parsed the XML dump, processed words and created inverted index by recording word counts in each page.
- Implemented multi-field query search and page ranking mechanism using Tf-Idf metric. Optimized the system for reducing index creation time, index size and query search time.

ChefGAN : Meal Image Generation from Ingredients **Jun'21 - Jul'21**
Multi-modal Learning, Generative Adversarial Network *IIIT, Hyderabad*

- Trained an attention based cross-modal network consisting of Bidirectional LSTM and ResNet to match an ingredient list and its corresponding image in a joint latent space using triplet loss.
- Trained a modified StackGAN-v2 conditioned on encoded ingredients for generating meal images from noise by using cycle consistency constraint.

Social Champion Identification **Nov'17 - Feb'18**
Retrieval and Ranking Application *Mastek, Mumbai*

- Developed a web application for the NGOs to obtain a list of prospective donors and influencers on social networks who can help in promoting NGOs.
- Implemented a program to retrieve Facebook and Twitter feeds regarding social awareness by using the respective APIs to analyse the users associated with them, considering various aspects, and ranked users based on their calculated prospectiveness score.

Virtual Lab for Requirements Engineering **Sep'20 - Nov'20**
Web Application *IIIT, Hyderabad*

- Developed a React-JS web application to create an interactive environment for the user to learn Requirements Engineering in a practical way by simulating various game-like activities.
- Created a canvas using GoJS to let users draw use-case diagrams for the given problem statements, provided relevant hints whenever required and evaluated the users based on their performance in all activities.

Peer-to-Peer Group Based File Sharing System **Sep'20 - Oct'20**
Torrent Application *IIIT, Hyderabad*

- Built a terminal based file sharing system where users can login, join groups and share or download files.
- Divided the file to be downloaded into logical pieces and applied piece selection algorithm to download chunks parallelly from multiple seeders and leechers.

Technical Skills

- **Programming Languages**: Python, C++, C, Java, Bash, Assembly
- **ML Frameworks**: Pytorch, Keras, Numpy, Pandas, SKLearn, OpenCV, MatPlotLib, Librosa, NLTK, Genism
- **Web Development**: HTML, CSS, PHP, JavaScript, AJAX, BootStrap, Flask, ReactJS, Laravel, Xampp
- **Database Management**: MySQL, MSSQL, Oracle, Firebase
- **ETL and Reporting Tools**: AbInitio, Informatica, Talend, Tableau, Qlikview