

SURAJ KOTHAWADE

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EDUCATION

Bachelors of Technology - Computer Science & Engineering (8.94/10.0) (July'14 - June'18)
Shri Guru Gobind Singhji Institute of Engineering & Technology (SGGSIE&T), Nanded, India

FIELDS OF INTEREST

Artificial Intelligence, Machine Learning, Deep Learning, Natural Language Processing

WORK EXPERIENCE

Aitoe Labs (Apr'18 - Ongoing)
Machine Learning Engineer

- Working on analyzing gargantuan amount of data from 500+ cameras in Bhopal(IN) to deliver person search, face search, face recognition and text search.

INTERNSHIPS

Indian Institute of Technology, Bombay (Dec'17 - Ongoing)
Research Intern

- Working with Prof.Ganesh Ramakrishnan on *developing machine learning models to solve computer vision problems in CCTV videos*.
- Delivered Compliance and Quality Monitoring System for the **Ministry of Rural Development**.
- Working on Domain Specific Video Summarization: [arXiv-preprint](#)
- Working on Open Source toolkit for Visual Data Subset Selection and Summarization using Submodular Functions: [arXiv-preprint](#) [GitHub](#)

Indian Institute of Technology, Bombay (May'17 - July'17)
Research Intern

- Worked with *Fundamental Research Group* on project *Event Logging and Content Version System*
- Developed a module that would facilitate imperative Events to be stored in a Local DB and synchronize back up to cloud servers, maintained versions of DB, Analyze DB to using Machine Learning to make indispensable business decisions and construct visualizations.
- Project Link: [drupal-logger](#)
- Project Report: [Event Logging and CVS](#)

Tata Consultancy Services, Innovation Labs, Mumbai (Dec'15 - Jan'16)
Research Intern

- Worked on project *Mobile Security For Visually Impaired* based on Human Computer Interaction
- Used research methodologies like Contextual Inquiries and Affinity Diagrams to identify significant challenges faced by the visually impaired.

PROJECTS

Massive scale search and recognition (Bhopal Police, Madhya Pradesh, India) (Aug'18 - Ongoing)

- Implementing person search, face search, face recognition and text search.
- Rigorous bench marking to decide hardware configurations.
- Working on engineering problems like scheduling tasks efficiently to GPUs, storage and retrieval of huge metadata for quick search.

Compliance and Quality Monitoring System (Ministry of Rural Development) (Dec'17 - July'18)

- Lead a team of four people to deliver the following compliance.
- Predict if a Class has Started or Not. (Implemented Handcrafted features for higher accuracy)
- Classroom Attendance - Person Count. (Tried out MobileNet SSD, HAAR Cascades and YOLO, Custom Trained YOLO)
- Uniform Detection. (Tried out different Similarity measures, used multi-class customized YOLO)

CBIR on AWiFS Data from Large Satellite Image Repository (Indian Space Research Organization) (Dec'17 - July'18)

- Identified Water bodies and Burnt Areas from the satellite image based on multiple algorithms.
- Working extensively on the Analytics including Machine Learning, Feature Engineering and Code Optimization.

Application of DCNN to Prevent ATM Fraud by Facial Disguise Identification (Feb'17 - Nov'17)

- Used Deep Convolutional Neural Network (DCNN) to create a model to classify disguised partially disguised and undisguised faces.
- Used Tensorflow to train DCNN based model on a diverse dataset of faces and analyzed results using activations.
- Optimized accuracy till 90.5% by using stochastic optimization, varying learning rate and momentum.

RESEARCH PAPERS

- A Framework towards Domain Specific Video Summarization, Winter Conference on Applications of Computer Vision (WACV 2019 — Under Review) [arXiv-preprint](#)
- Vis-DSS: An Open-Source toolkit for Visual Data Selection and Summarization, Winter Conference on Applications of Computer Vision (WACV 2019 — Under Review) [arXiv-preprint](#)
- Learning From Less Data: A Unified Data Subset Selection and Active Learning Framework for Computer Vision, Winter Conference on Applications of Computer Vision (WACV 2019 — Under Review)
- Demystifying Multi-Faceted Video Summarization: Tradeoff Between Diversity, Representation, Coverage and Importance, Winter Conference on Applications of Computer Vision (WACV 2019 — Under Review)
- Content Based Image Retrieval from AWiFS Images Repository of IRS Resourcesat-2 Satellite Based on Water Bodies and Burnt Areas, Winter Conference on Applications of Computer Vision (WACV 2019 — Under Review) - [arXiv-preprint](#)
- Deployment of Customized Deep Learning based Video Analytics On Surveillance Cameras, Winter Conference on Applications of Computer Vision (WACV 2019 — Under Review) - [arXiv-preprint](#)
- Application of Deep Convolutional Neural Network to prevent ATM fraud by facial disguise identification, IEEE International Conference on Computational Intelligence and Computing Research (ICCIC 2017).
- Effective Water Management For Greenland Using Soil Humidity Sensor, IEEE International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES 2016).
- Contributed to Coping with Accessibility Challenges for Security — A User Study with Blind Smartphone Users, Human-Computer Interaction — INTERACT 2017, pp 3-22

IMPORTANT COURSES UNDERTAKEN

- **SGGSIE&T, Nanded:** Artificial Neural Networks, Machine Learning, Discrete Mathematics, Data Structures, Design & Analysis of Algorithms, Distributed Computing, Linear Algebra, Differential Equations.
- **Coursera:** deeplearning.ai Specialization, UMich: Python Programming Specialization(Core Python, Databases, Networking), UCSD: Data Structures and Performance(97.0/100), UCSD: Object Oriented Programming in Java (98.5/100), Rice : Interactive Programming in Python(98.0/100)
- **Udacity:** Google: Introduction to Machine Learning, Deep Learning by Google
- **NPTEL:** IIT Kharagpur: Machine Learning & Neural Networks, IIT Madras: Operating Systems, CMI Chennai : Algorithms, IIT Kanpur: Theory of Computation, IISC Bangalore: Compiler Design & Optimization
- **NVIDIA:** Deep Learning using CUDA (Workshop)

TOOLS & LIBRARIES

- **Languages:** C(advanced), C++(advanced) Python(advanced), Java(Advanced) PHP(beginner), Javascript(beginner)
- **Frameworks:** Tensorflow, caffe, keras, OpenCV

ACHIEVEMENTS

- **Best Student Award** 2018 by Tata Consultancy Services.
- **Best Student Project Award** 2018 by Tata Consultancy Services.
- **Best Paper Award** at 2017 IEEE International Conference on Computational Intelligence and Computing Research (ICCIC).
- Qualified for onsite regionals of **ACM ICPC** for Amritapuri Regionals in 2017.
- Ranked **1st/160** in Computer science & Engineering department in Junior year & Cumulatively ranked **2nd/160**.
- Awarded **1st** runner up prize at APOGEE 2016, BITS Pilani's Apogee Innovation Challenge Competition in collaboration with Schneider Electric, India.
- Won My Green Idea Competition at BITS, Goa and was awarded an opportunity to work with Imagine Panaji, Government of Goa.
- Awarded Best Paper Award at E-Paper, SGGSIE&T, Nanded.
- Awarded **2nd** Best Project in Software Development Competition 2016, SGGSIE&T, Nanded.
- Awarded **2nd** Prize at Innovative Apps & Appliances, SGGSIE&T, Nanded.
- My team Glock was ranked **549** in 2016 and **551** out of more than 32000 teams in TCS CodeVita 2016 and 2017 respectively.
- Represented University Badminton Team for 4 consecutive years at a National level.