

ADITYA KANE

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EDUCATION

Examination	University	Institute	Year	CGA/%
Bachelor of Computer Engineering	Savitribai Phule University	Pune Pune Institute of Computer Technology	2023	9.77
Intermediate/ +2	HSC	Sri Chaitanya Institutes	2019	84.61%
Matriculation	SSC	BVB's Paranjape Vidya Mandir	2017	93.6%

Currently pursuing **Fourth Year of Bachelor of Computer Engineering** August 2019 - Present

EXPERIENCE

Research Intern — IISc, Bengaluru

May 2022 - Present

Prof. Suresh Sundaram | Out-of-Distribution (OOD) Detection and Open Set Recognition in NLP

- Working on **Out-of-Distribution and Open Set detection** in NLP under the guidance of Dr. Chandan Gautam at Artificial Intelligence and Robotics Lab, IISc, Bengaluru.
- Explored various methods for **few-shot unsupervised OOD detection**. We experimented with prototypical networks and meta learning with demonstration-based data augmentation.
- Explored **unsupervised open set recognition** methods for NLP using **compute-efficient model** architectures. We further introduce few-shot and continual setups for open set detection.

Student Developer Intern — Google Summer of Code

May 2022 - September 2022

TensorFlow, KerasCV | Computer Vision

- Implemented various model blocks like **StochasticDepth**, **DropPath**, **SqueezeAndExcite** and incorporated them into KerasCV.
- My code contributions include addition of augmentation layers with **bounding box support** like **Inception crop** and other bug fixes. Added a new **robust serialization test** which eliminated the need of hand-engineered tests for new modules.
- Worked on porting over Computer Vision models like **ResNets**, **EfficientNets**, **RegNets** to KerasCV. Report available [here](#).

Student Developer Intern — Google Summer of Code

May 2021 - August 2021

TensorFlow | Computer Vision

- Implemented and trained four variants of RegnetY from the paper “**Designing network design spaces**” by Facebook AI Research on **ImageNet-1k** using **TensorFlow 2**.
- Created efficient data input pipelines and trained four variants of RegNetY on **Google Cloud TPUs**.
- Created multiple scripts for efficient data preprocessing, implemented custom training loop and inference functions. Used **Python** and TensorFlow’s Python API.
- The resulting models had **exceptional inference speeds** and are now publicly available via TFHub. Report available [here](#).

Research Intern — PICT, Pune

October 2020 - Present

Prof. Geetanjali Kale | Object detection

- Working on the research project “**Question Wise segmentation of Handwritten examination paper in AI-Assisted Grading System**”.
- Responsible for designing and maintaining codebase and dataset of the project.
- Used **RetinaNet** to **segment questions** in a handwritten answer sheet. Created multiple scripts using **PyTorch** for seamless training, testing and inference.
- Achieved significant improvement over present text detectors on this task. Currently working on **drafting and finalizing** the paper for submission to a reputed scientific journal.

PUBLICATIONS & RESEARCH

An Efficient Modern Baseline for FloodNet VQA

May 2022

[Best Paper] ICML NewInML Workshop 2022

[Paper](#) | [Code](#)

- Authors: **Aditya Kane**, Sahil Khose
- Proposed a simple system for visual question answering (VQA) based on modern vision and language architectures.
- Designed a VQA system for FloodNet dataset using feature combination methods like concatenation, addition and multiplication.
- Improved state-of-the-art results on FloodNet dataset by a considerable margin.

Transformer based ensemble for emotion detection

March 2022

[Oral] ACL WASSA Workshop 2022

[Paper](#) | [Code](#) | [WandB](#)

- Authors: **Aditya Kane**, Shantanu Patankar, Sahil Khose, Neeraja Kirtane

- Developed ensemble based solution consisting of multiple ELECTRA and BERT models. Proposed methods for synthetically generating datasets to mitigate distribution imbalance.
- Studied the behaviour of our models and ensemble of models on various raw and synthetically generated datasets.

Unsupervised Out-of-Distribution Detection Using Few In-Distribution Samples

May 2022

Under review

- Authors: Chandan Gautam, **Aditya Kane**, Savitha Ramasamy, Suresh Sundaram
- Explored the problem of out-of-distribution (OOD) detection in NLP in a few-shot setting.
- Used prototypical networks, meta learning and data augmentation. Our method outperforms existing methods for OOD detection.
- First-Order MAML (FO-MAML) and Reptile were meta learning methods of choice. Our system uses prompt and demonstration based augmentation for greater sample efficiency.

G-OSR: Gating-based Simple and Strong Baseline for Open-Set Recognition

June 2022

Under Review

- Authors: Chandan Gautam, **Aditya Kane**, Savitha Ramasamy, Suresh Sundaram, Parameswaram Sethupathy
- This work explores open-set recognition in NLP using compute-efficient architectures.
- Presented a novel gating-based architecture for open-set detection. Moreover, this architecture is computationally efficient than the well-known transformer architecture.
- Our methods outperform existing well-known open set recognition methods like OpenMax, DeepUnk and Adaptive Decision Boundary.

Efficient Gender Debiasing of Pre-trained Indic Language Models

September 2022

Under Review

[Paper](#) | [Code](#)

- Authors: Neeraja Kirtane, V Manushree, **Aditya Kane**
- This work focuses on quantifying and mitigating occupational gender bias in pretrained large language models.
- Introduced a procedure to quantify bias as well as to mitigate bias. Our contributions also include creation of a Hindi dataset for mitigation of gender bias.
- Eliminated gender bias in these models by retraining a small subset of model parameters. We observe significant reductions in gender bias using this technique.

Continual VQA for Disaster Response Systems

September 2022

Under review

[Paper](#) | [Code](#) | [WandB](#)

- Authors: **Aditya Kane**, V Manushree, Sahil Khose
- This paper extend the work in “An Efficient Modern Baseline for FloodNet VQA” to continual and zero-shot scenarios.
- Proposed episodic memory based methods since a continual setting most closely resembles real-life scenario of disaster handling.
- Provide ablations on zero-shot CLIP and supervised training using CLIP features and comprehensive experiments for continual setup.

PROJECTS

Added RegNets to `tf.keras.applications`

January 2022

Computer Vision

- Extended my project from Google Summer of Code to encompass a wider scope.
- Implemented and trained **24** variants of RegNets on the **Imagenet-1k** dataset.
- These models are now added to `tf.keras.applications` and are available in TensorFlow 2.9 and later.
- Collaborators: [Sayak Paul](#). Models available at: tensorflow.org/tf/keras/applications/regnet

Limited Supervision Architectures

September 2022

Deep Learning

- Every week we implement vital components of state-of-the-art architectures for limited supervision under 2 hours.
- The aim is to get a deeper understanding of the architectures. As a prerequisite, we read the paper but refrain from looking at the code.
- We have implemented ViTs, GANs and CycleGANs so far. We plan to implement SimCLR, DINO and MAE in near future.
- Collaborators: [Sahil Khose](#). GitHub repo: [AdityaKane2001/noob-speedrun](https://github.com/AdityaKane2001/noob-speedrun)

VOLUNTEER EXPERIENCE

TensorFlow User Group (TFUG) Pune

September 2021 - Present

- Co-organizer of TensorFlow User Group, Pune for past one year. TensorFlow User Groups are local communities of students and practitioners of the TensorFlow library spread across the world.
- Our community has 3000+ registered members. We host at least one technical talk each month and occasional Kaggle competitions. We enjoy a turnout of around 40 people for each event.
- Received the **“Most Impactful Community Leader”** award by Google for consistently organizing most TFUG events in 2021.

COURSES

Online Courses

Deep Learning, DeepLearning.AI TensorFlow Developer , Web Applications for Everybody

TECHNICAL SKILLS

Languages	Python (proficient), C++ (working knowledge), PHP, SQL, HTML
Frameworks	NumPy, TensorFlow, Keras, PyTorch, JAX, Flax
Others	Git and GitHub, Google Cloud