Shivasankaran V P

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Personal Profile

A senior undergraduate student at Indian Institute Of Technology Gandhinagar specialising in computer science and engineering. I am deeply fascinated by the application of Artifical Intelligence with regards to computer vision tasks.

Education

Indian Institute of Technology Gandhinagar   *Gandhinagar, India*
BTech in Computer Science and Engineering   *2019 - Current*
- **Current CPI:** 8.74
- **Courses:** Deep learning, Transformers and GNNs, Natural Language Processing, Data Science, Compilers, Computer networks, Computer network security

Chennai Public School   *Chennai, India*
High School   *Apr 2017 - Apr 2019*
- Specialised in Physics, Chemistry, and Maths with Computer Science
- Top 5 percentile among 2.8 million students

Research Experience

LineEX: Data Extraction from Scientific Line Charts   *Gandhinagar, India*
                                                                                                   Dec 2021 - Aug 2022

- Adapted existing vision transformers and human-pose estimation methods to Data extraction.
- Proposed a novel loss function for data extraction from line charts and proved its effectiveness.
- Developed a new metric to more accurately describes the quality of the extracted data points.
- Created the largest synthetic line chart dataset comprising 430K images.
- Showed significant performance gains over the SOTA methods.
- Accepted in WACV 2023
- **Supervisior:** Professor Mayank Singh

Multi-Modal 3D-object Retrieval   *Gandhinagar, India*
                                                                                                    Aug 2022 - Current

- Using textual description and hand-drawn sketches to perform 3D-object retrieval.
- Leveraging recent advancements in contrastive learning between images and text.
- Presented in the undergraduate research showcase of IIT Gandhinagar
- **Supervisior:** Professor Shanmuganathan Raman

'Sufficient' Attention is All You Need   *Gandhinagar, India*
                                                                                                    Aug 2022 - Current

- Exploring sparse self-attention patterns for small scale vision transformers with limited training data
- Best-performing sparse self-attention ViT outperforms the full self-attention variant by 12 accuracy points
- Exploring the possibility of alternative learnable attention patterns instead of fixed full self-attention

Internships

Strand Life Sciences Pvt. Ltd   *Bangalore, India*
Software Intern, Research Informatics   *May 2022 - Jul 2022*
- Quantification and Identification of Tumor-infiltrating lymphocytes from WSIs.
- Evaluated various models proposed in the scientific literature for Industrial use.
- Implemented changes in certain models and evaluated their performance.
- Adopted various methods to bridge the lack of big datasets available for the task
- Created a pipeline based on the current State of the art model for the problem.

Projects

COMMENTATOR: A Code-mixed Multilingual Text Annotation Framework
Gandhinagar, India

IIT Gandhinagar
Aug 2022 - Oct 2022

- Extended the annotation tool for multilingual sentiment analysis.
- Implemented features for sentence-level and word-level sentiment suggestions.
- Notable features include an uploadable custom model for sentence-level suggestions.

Movie recommendation system using Neural collaborative model
Gandhinagar, India

IIT Gandhinagar
Feb 2021 - Apr 2021

- Implemented and trained a neural collaborative filtering model.
- Implemented content-based method and matrix factorization method.
- Achieved **SOTA** RMSE of 0.84 for the Neural collaborative model.

Information extraction of devices behind NAT using WebRTC
Gandhinagar, India

IIT Gandhinagar
Aug 2021 - Nov 2021

- Extracted private IP and other sensitive information about a client behind a NAT.
- Exploited a technical flaw in WebRTC.
- Evaluated the vulnerability on major browsers and discussed the prevention mechanisms.

Sign Language Translator In Verilog Using Convolutional Neural Networks
Gandhinagar, India

IIT Gandhinagar
Sep 2020 - Nov 2020

- Implemented a convolutional neural network in Verilog.
- Optimized the network to work with Verilog floating point precision system.
- Attained an accuracy 0.84.
- Designed the final system to be synthesizable on a FPGA board.

Publications

- **Shivasankaran V P**, Muhammad Yusuf Hassan, Mayank Singh. LineEX: Data Extraction from Scientific Line Charts. Accepted at WACV 2023 conference.

Teaching Experience

Teaching Assistant: ES 413 Deep Learning
Gandhinagar, India

IIT Gandhinagar
Jan 2023 - Ongoing

- Creating and teaching tutorials for 40 graduate and undergraduate students

Skills

Programming Python, PyTorch, Tensorflow , C/C++, Flask, HTML/CSS, JavaScript, SQL, .
Miscellaneous Linux, Shell (Bash), Git.

Achievements

2022	**Dean's list**, Semester 1 and 6	*India*
2022	**Selection**, Google Research Week	*India*
2022	**Selection**, Amazon ML summer school	*India*
2019	**All India rank 1319**, JEE Advanced 2019; 1.6 lakh students	*India*
2019	**All India rank 1916**, JEE Main 2019; 1.2 million students	*India*

References available upon request.