Janvi Thakkar

Artificial Intelligence · Machine Learning · Reinforcement Learning · Human-Computer Interaction

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Education

Indian Institute of Technology Gandhinagar *Gandhinagar, India*

B.Tech. with Honors in Computer Science and Engineering (Cumulative Performance Index (CPI): 8.99/10) *2018 - 2022*

Publications

Shril Mody*, **Janvi Thakkar***, **Analysis of Image Generation using Scene graphs**, ACM India Joint International Conference on Data Science and Management of Data, Young Researcher Symposium (YRS) track (**CODS-COMAD 2022**) [pdf]

Shril Mody*, **Janvi Thakkar***, Devvrat Joshi*, Siddharth Soni*, Nipun Batra, Rohan Patil, **Geometrical Homogeneous Clustering for Image Data Reduction**, SubsetML Workshop (Poster Track), International Conference on Machine Learning (**ICML 2021**) [pdf]

* indicates equal contribution

Awards & Honors

2022	**Honored with Lalita J Shah & Jayantilal B Shah Scholarship**, IIT Gandhinagar ($1340)	*Gandhinagar, India*
2021	**Awarded Scholarship for Excellence in Arts and Culture**, IIT Gandhinagar ($270)	*Gandhinagar, India*
2021	**Honored with P.K. Kelkar Scholarship**, IIT Gandhinagar ($1340)	*Gandhinagar, India*
2021	**Student Travel Grant**, International Conference on Machine Learning (ICML)	*Online*
20'16-21	**Academic Excellence**, Secondary(10/10), Senior Secondary(92.6%), and Dean's list in I-III,V semesters of UG	*India*
2019	**Academic Excellence Scholarship**, Highest grade point in AY 2018-19 in the discipline ($270)	*Gandhinagar, India*
2018	**Gold Medal**, BeTIC Medical Innovation Challenge, 7th Inter IIT Tech Meet, IIT Bombay	*Bombay, India*
2018	**Bronze Medal**, Costume Designing, 3rd Inter IIT Cultural Meet, IIT Roorkee	*Roorkee, India*

Experiences

Data Scientist Intern

Decimal Point Analytics *Mumbai, India*

Mentor: Arbind Kumar *May 2021 - July 2021*

- Fine-tuned two different text summarization models on custom data, i.e., an abstractive model - BART and an extractive model - BertSum with transformer classifier.
- Designed an API using the Flask framework for the text summarization task.

Summer Research Associate

Lancaster University *Lancaster, United Kingdom*

Mentor: Prof. Leandro Soriano Marcolino (Remote) *May. 2020 - July. 2020*

- Learned models on-line of a large number of agents (swarm) and used those models for on-line planning under strong real-time constraints.
- Implemented the Monte Carlo Tree Search(MCTS), a simulation-based approach for the continuous action space for making sequential decision.
- The technique was evaluated in an "infiltration game", where an agent's goal is to reach the target guarded by an unknown patrolling swarm without any pretraining.

Summer Intern

Capgemini, India *Gandhinagar, India*

Mentor: Ashish Buch *April. 2020 - May. 2020*

- Designed a model for identifying contextual similarity based on the test ID and keyword from a large number of test cases and requirement documents written in English.
- Used Universal Sentence Encoder (USE) model for generating contextual embeddings of a word document and cosine similarity for measuring the percentage analogous in the test cases

Postions of Responsibility

2020-2021	**Secretary of Art Club**, Palette, IIT Gandhinagar	*India*
2020-2021	**Web Developer, Jashn 9.0**, Intra Institute Cultural Fest, IIT Gandhinagar	*India*
2020-2021	**Core Member**, Codechef Campus Chapter - GRASP	*India*
2019,2020	**Team Leader, National Robotics Competition: eYantra -2019 and 2020**, IIT Gandhinagar Team	*India*
2019-2020	**Organizer**, Inter College Technical Fest, Ignite 5.0, IIT Gandhinagar	*India*
2019-2020	**Coordinator of Robotics Club**, Mean Mechanics, IIT Gandhinagar	*India*

Projects

Open Problems in Federated Learning and An Approach to Federated Graph Clustering
IIT Gandhinagar

Mentor: Prof. Anirban Dasgupta — *Jan. 2022 - April 2022*

- Explored open issues in FL and proposed a state-of-the-art FL algorithm to handle the problem of federated graph clustering.
- Used power iteration method that employs a subtle strategy to synchronize the eigenvectors among clients.
- Tested the proposed power iteration approach on the ego-facebook and email-Eu-core dataset and obtained a similarity of 99.8% and 98.85%, comparable to that of global clustering.

Implementing VR Environment for Autistic and Stroke patients
IIT Gandhinagar

Mentor: Prof. Uttama Lahiri — *Jan. 2022 - April 2022*

- Developed two virtual reality (VR) environments - A drawing challenge concentrating on children with autism and a football-themed balance training challenge that focuses on stroke sufferers.
- Integrated both the environments with the tracker and calibrated the designed environment with the real-world task.

Differentially Private k-means clustering with Guaranteed Convergence
IIT Gandhinagar

Mentor: Prof. Anirban Dasgupta — *Aug. 2021 - Dec. 2021*

- Proposed a variant of differentially private k-means clustering: SubCluster Guarantee algorithm with guaranteed convergence
- For given ϵ-privacy budget the implementation improves the clustering quality over the current-SOTA algorithm while maintiaing the same differential privacy requirements.

Analysis of Image Generation using Scenegraph Report
IIT Gandhinagar

Mentor: Prof. Shanmuganathan Raman — *Jan. 2021 - April. 2021*

- Analyzed the pipeline involved in generating an image using scene graphs from textual descriptions of the image.
- Re-implemented the process of converting text to a scenegraph and an image to a scenegraph. And then, the generated scenegraphs are passed to a model, which creates an image from the scenegraph.
- Tested on MSCOCO and Visual Genome dataset using different similarity metrics.
- Paper Publication at CoDS-COMAD 2022, Author list: Shril Mody, Janvi Thakkar

Geometrical Homogeneous Clustering for Image Data Reduction Report Presentation
IIT Gandhinagar

Mentor: Prof. Nipun Batra — *Jan. 2021 - April. 2021*

- Proposed a novel approach to reduce an image dataset using a Geometrical Homogenous Clustering(GHCIDR).
- Acquired an accuracy of 99.35 % and 81.10%, and a training data reduction of 87.27% and 32.34%, on MNIST, and CIFAR10 respectively.
- Paper Publication at ICML 2021, Author list: Shril Mody, Janvi Thakkar, Devvrat Joshi, Siddharth Soni, Nipun Batra, Rohan Patil

Twitter Analysis of COVID19 Repository Presentation
IIT Gandhinagar

Mentor: Prof. Anirban Dasgupta — *March. 2021 - Apr. 2021*

- Analyzed data collected by extracting tweets containing important trending hashtags about the COVID-19 pandemic using Twitter API - Tweepy.
- Used various analytical tools such as clustering, text summarization, semantic analysis, and geobased analysis to get specific and useful insights from the tweets.

MiniC - Mini compiler for C language Repository
IIT Gandhinagar

Mentor: Prof. Bireswar Das — *March. 2021 - Apr. 2021*

- A toy compiler for C language that generates MIPS assembly code.
- Implemented all the basic features including control flow, loops, Boolean, and arithmetic operations.
- Handled advanced features comprising recursive functions, arrays, and exceptions.

Snappy - Command line tool for Snapshot Management Repository
IIT Gandhinagar

Mentor: Prof. Nipun Batra — *Sept. 2020 - Dec. 2020*

- Created a command-line tool for the Linux file system that supports snapshot management
- Used traditional split-mirror-based approach with some improvisation over the data storage required while creating the copy.
- Implemented various functionalities to create, delete and manage the snapshots of the directories.

MiniWhatsApp Repository
IIT Gandhinagar

Mentor: Prof. Sameer Kulkarni — *Oct. 2020 - Nov. 2020*

- Implemented a Mini-WhatsApp tool that supports features such as chatting(individual/group), file sharing, and profile creation.
- Understood and implemented Peer-to-peer communication for the individual chat and concurrent server for group-chat.
- Provided an option to see the status of other online users and request for the group chats.

FPGA Implementation of a Neural Network for Character Recognition Repository
IIT Gandhinagar

Mentor: Prof. Joycee Mekie — *Oct. 2019 - Dec. 2019*

- Understood and implemented 3-Layer Neural Network in Field Programmable Gate Array(FPGA) for Character Recognition.
- Trained the Multilayer Perceptron Model in Python using MNIST dataset and used Xilinx Vivado for synthesis and analysis of Verilog designs.

Note: Experiences include full-time commitment of min 40 hours/week; projects require a commitment of about 12 hours/week
***** indicates research in progress

Technical Knowledge

Programming Languages: Python, C, JAVA, C++, SQL, HTML, CSS, Bash Scripting, Javascript, Bootstrap

Tools: Git, IntelliJ, Visual Studio, Eclipse, Android Studio, MATLAB, Autodesk Inventor, LaTeX, Mininet, Django

Relevant Coursework

At IIT Gandhinagar: Machine Learning, Data Science, Operating System, Databases, Discrete Mathematics, Compilers, Theory of Computation, Computer Networks, Data Structures and Algorithm (I & II), Computer Organization and Architecture, Computing, Calculus, Differential Equation, Linear Algebra [***transcript***]

Massive open online courses (MOOCs): Reinforcement Learning Specialization Courses [***certificates***]