

# Vismay Patel

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## Education

Program	Institution	Year of Completion
M.S. (Computer Science and Engg.)	Indian Institute of Technology Madras	2018
B.Tech. (Information Technology)	Institute of Technology, Nirma Uni.	2014

## Course Work

- **Machine Learning:** Introduction to ML, Kernel Methods for Pattern Analysis, Artificial Neural Networks
- **Computer Vision:** Geometry and Photometry-based CV, Digital Video Processing, Computational Photography

## Professional Experience

**Applied Scientist** **January 2022 - Present**

*MARS Team, Amazon INC, Bangalore, India*

- Patch-based Image Retrieval (Sagemaker, ES, Lambda, Step functions)
- Few-shot and Zero-shot Object Detection (Sagemaker, Lambda)
- Active Learning Techniques for Image-based Moderation (Sagemaker, Lambda, Step functions)

**Machine Learning Engineer 1** **April 2020 - January 2022**

*Global R&D Team, Verisk, Hyderabad, India*

- Document Information Extraction (Document Object Detection, Key-value pair Extraction)
- Active Learning Platform (Labelstudio, AWS Sagemaker Groundtruth)
- Pandemic Modeling (Large-scale network models, Agent-based models)

**Software Development Engineer** **August 2018 - April 2020**

*Codenation LLC, Bangalore, India*

- ML Factory. End-to-end framework for streamlining machine learning on structured data. (AWS Sagemaker, Django)
- Time-series forecasting and analysis pipelines on No-code platform for Industry 4.0. (Keras, Django, Node-red)
- Automatic code cleanup using knowledge graphs. (Neo4j, Spring boot, AWS)

**Internship** **February 2018 - April 2018**

*Find Me A Shoe, Chennai, India*

- Pose estimation solution to accurately detect 4 corners of a paper.

## Publications

- **Vismay Patel**, Mayank Gupta, and Pooja A. "Large-scale Patch-based Image Retrieval." In AMLC 2022.
- **Vismay Patel**, Niranjan Mujumdar, Prashanth Balasubramanian, Smit Marvaniya, and Anurag Mittal. "Data Augmentation using Part Analysis for Shape Classification." In WACV 2019.
- **Vismay Patel**, Arulkumar Subramaniam, Ashish Mishra, Prashanth Balasubramanian, and Anurag Mittal. "Bi-modal first impressions recognition using temporally ordered deep audio and stochastic visual features." In Computer Vision–ECCV 2016 Workshops, pp. 337-348. Springer International Publishing, 2016.
- Anubha Pandey, **Vismay Patel**, "Generative Image Inpainting for Person Pose Generation" and "Joint Caption Detection and Inpainting using Generative Network" published as two chapters in the Springer book title "Inpainting and Denoising Challenges".

## Key Projects

- **Symbol Detection for Moderation (Python, Pytorch, AWS)** **March 2022 - August 2022**  
*Amazon, Team Size:1*
- Supervised Object detection models

- Weakly Supervised Training
- Productionization

### **Patch-based Image Retrieval (Python, Pytorch, AWS)**

**January 2022 - March 2022**  
Amazon, Team Size:1

- Unsupervised Object Proposals
- Local feature extraction with Geometric and Photo-metric Invariances
- Large-scale indexing and retrieval

### **Document Understanding (Python, Pytorch, Flask, AWS)**

**March 2020 - August 2022**  
Verisk, Team Size:3

- Object detection models (Centernet2, MaskRCNN, LayoutLM) to do layout detection on document images.
- Domain Adaptation techniques to extend pretrained detection models to other domain of documents.
- Layout generation techniques for synthetic data generation.
- Active learning to train models with less data.

### **Pandemic Modeling (Python, Scipy, Dash)**

**July 2020 - July 2021**  
Verisk, Team Size:1

- Developed various statistical models used for pandemic modeling.
- Developed efficient agent-based models for pandemic modeling. 9x faster random network generators compared to NetworkX, 8x faster page rank/network diffusion algorithms compared to NDLib.
- Developed SDK for network generation and diffusion, Developed a dashboard for visualization.

### **Data Augmentation using Part-based Deformations of Shapes (Matlab, Torch)**

**Aug 2015 - Feb 2018**

Guide: Prof. Anurag Mittal

M.S. Project, Team Size:1

- Thesis research work, to address the problem of learning good image classifiers with limited labeled data.
- We propose to use the part analysis of shapes extracted from available images to augment the labeled data.
- We show improved performance with CNN classifiers for shape classification task using such augmentation.

### **Video and Image inpainting (Python, Pytorch)**

**March 2018 - May 2018**  
Competition, Team Size:2

- Employed GAN based techniques to do removal of captions from videos and images.
- Scored 3rd rank in the competition.

### **Personality Analysis from Interview Videos (Lua,Torch)**

**May 2016 - Aug 2016**  
Competition, Team Size:4

- Done it as part of "First Impressions" challenge organized by Chalearn Looking at People.
- Designed and Implemented a Deep Learning based solution for Personality Analysis from Videos. Employed a novel training technique for videos.
- Scored 2nd rank in the competition.

## **Other Computer Vision Projects**

### **Human pose transfer (Pytorch)**

Faculty: Dr. Mitesh Khapra, Topics in DL

**Oct 2017 - Nov 2017**

Course Project, Team Size:2

### **Gesture Recognition for DVS camera (Matlab)**

Faculty: Dr. Kaushik Mitra, Computational Photography

**Aug 2016 - Nov 2016**

Course Project, Team Size:2

### **Using CNN features with Hough Forest for Pedestrian Detection (Matlab,Caffe)**

Faculty: Dr. Anurag Mittal, Artificial Neural Networks

**Nov 2015 - Jan 2016**

Course Project, Team Size:1

## **Technical Skills**

- **Languages:** Python, Java, Lua.
- **Computer Vision,Deep Learning Frameworks** PyTorch, Keras, Sklearn, Tensorflow, Caffe, OpenCV.
- **Devops** Kubernetes, Docker, Kubeflow
- **Other tools/frameworks** - AWS, Neo4j, node-red.

## Positions of Responsibility

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- Teaching assistant for the courses: Artificial Neural Networks, Geometry and Photometry-based CV.
- Served as the Administrative Head for IEEE student branch, Nirma University, academic year 2013-14.

## Achievements and Participation

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- Won 3rd prize (ECCV '18) in the challenge on "Video Decaptioning" organized by Chalearn Looking at People.
- Won 2nd prize (ECCV '16) in the challenge on "First Impressions" organized by Chalearn Looking at People.

## Guide

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- Dr. Anurag Mittal, Professor, Department of Computer Science and Engineering, IIT Madras, Chennai.  
(<http://www.cse.iitm.ac.in/amittal/>)