

# KSHAMA NITIN SHAH

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## OBJECTIVE

AI Engineer with 2+ years of experience delivering end-to-end AI solutions across vision, language, and multimodal tasks. Seeking Full-time opportunities in the field of Machine Learning, Deep Learning or Computer Vision

## RESEARCH AND WORK EXPERIENCE

### Research Associate

#### Dr. Justin Johnsons' Lab, University of Michigan, Ann Arbor

📅 Aug '22 – May '23

📍 Ann Arbor, MI

- Developed a simplified training recipe for open vocabulary instance segmentation using text supervision using a **CLIP-ViT Transformer** encoder and **SAM Transformer based Mask Decoder**, raising COCO Mask AP +7 pts while reducing training complexity.
- Implemented and benchmarked various **CNN and Transformer-based object detection models (FCOS, Mask R-CNN, ViTDeT, DETIC, Mem ViT)**, proving that the new method keeps 90% of full-data accuracy with only 10% labels and outperforms Mask R-CNN in low-data regimes.
- Responsible for coding, implementation and driving the research project using distributed code, multi GPU training using **Linux and SLURM**.

### Research Assistant

#### Dr. Andrew Owens' Lab, University of Michigan, Ann Arbor

📅 May '22 – May '23

📍 Ann Arbor, MI

- Developed a novel self-supervised multimodal image/video registration technique for medical imaging applications by training a ResNet-50 based optical flow estimation network

### Teaching Assistant, EECS 442/ EECS 504 - Computer Vision

#### University of Michigan, Ann Arbor

📅 Fall 2022 & Winter 2023

📍 Ann Arbor, MI

- Responsible for teaching tutorial sessions, creating assignments and holding office hours for students

### AI Algorithm Engineer

#### Stoneridge Inc

📅 Aug '23 – Present

📍 Novi, MI

- Designed and shipped perception & feature-extraction algorithms for truck camera-monitor systems, leveraging **deep learning algorithms**.
- Currently developing an advanced trailer panning algorithm that calculates trailer angle in real-time, leveraging **deep learning-based Line and Wheel detectors** for enhanced accuracy and performance.
- Developed a trailer-end detection network leveraging calibrated intrinsics/extrinsics; boosted estimation error from 55% to 88% and supports dynamic length estimation for 28-53 ft trailers.
- Integrated a 5-camera 360° bird's-eye-view stitcher using GPU projective warping and alpha blending; sustains 60 fps while staying under a 4W ECU power budget.
- Contributed to the United Nations' Sustainable Development Goal of Decent Work and Economic Growth by boosting sales of local SMEs and advising student entrepreneurs via AIESEC's Global Volunteer Exchange Program in Indonesia

## SELECTED PROJECTS

### Self Supervised Object Detection With Multimodal Image Captioning (GitHub)

📅 Feb '22 – Apr '22

📍 University of Michigan, Ann Arbor

- Developed a novel self-supervised pipeline that uses natural language supervision as a pre-training task with **VirTex (Vision-Language Transformer)** to localize objects in an image by generating pseudo ground truth object classes and bounding box coordinates.
- Achieved 21.6% mAP using just 1% labeled data, matching state-of-the-art semi-supervised methods while cutting training time and compute cost by 1.5x.

### Llama Interactive StoryTeller Application GitHub

📍 LIAmaCon Hackathon, San Francisco

## EDUCATION

### M.S. in Electrical & Computer Eng. (Signal Processing & Machine Learning)

#### University of Michigan, Ann Arbor

📅 Aug '21 – April '23

📍 GPA : 3.924/4.00

### B.Eng. in Electronics & Communication Engineering

#### Birla Institute of Technology & Science. Pilani

📅 Aug '16 – June '20

📍 GPA : 9.61/10.00

## COURSEWORK

Computer vision, Machine learning, Deep learning for computer vision, Natural Language Processing, Matrix Methods for signal processing, machine learning and data analysis, Probability and Random processes

## SKILLS

Python

Pytorch

NumPy

TensorFlow

MATLAB

Julia

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## LEADERSHIP EXPERIENCE

### Youth Entrepreneurship Program, AIESEC

📅 Jul '17 – Aug '17

### Vice President, University Relations AIESEC in Dubai

📅 Jan '18 – Jun '18

- Organized informational events across universities to increase awareness about AIESEC's exchange programs
- Facilitated the successful completion of several international exchange experiences for students across Dubai

### Core Committee Member, IEEE, BITS Pilani, Dubai Charter

📅 Aug 2017 – Aug 2019

- Organized and managed tech competitions and guest lectures by distinguished speakers in the university

- Developed & deployed “Interactive StoryTeller,” a full-stack **LLaMA-4 (LLM)** + **ElevenLabs TTS** web app that streams real-time, multilingual choose-your-own-adventure audio stories.
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## Visual Question Answering using customized prompts (**GitHub**)

📅 Aug 2022 - Dec 2022

📍 University of Michigan, Ann Arbor

- Developed a novel pipeline to perform zero-shot Visual Question Answering by conjoining **large pre-trained models such as CLIP and T-5 transformer**.
  - Achieved an overall accuracy of 49.5%, which is comparable to the state-of-the-art performance in zero-shot VQA, while using 10x lesser memory and computational resources.
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## A Monocular Local Mapper for Urban Scenes (**GitHub**)

📅 Aug 2021 - Dec 2021

📍 University of Michigan, Ann Arbor

- Developed a model that performs semantic segmentation, object detection and depth estimation simultaneously using **YOLOv1 and U-Net model**.
  - Obtained an overall accuracy of 83% by utilizing a single model for all three tasks, reducing the number of parameters required by 2x.
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## Language Supervised Vision Pre-training for Fine-grained Food Classification

📅 Mar '22 - Apr '22

📍 University of Michigan, Ann Arbor

- Pre-trained a downsized, memory-efficient image captioning model that used a **RegNetX-800MF and a 2 layer transformer** on the Food-101 dataset.
- Obtained a top 5% classification accuracy of 23.76% by doing zero-shot transfer and a classification accuracy of 20% after fine-tuning the above model on the downstream task of fine-grained food classification