

# Janmesh Ukey

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## EDUCATION

### Master of Science, Computer Science

*University of Utah*

GPA: 3.95/4.0

Thesis: Towards a fully automated framework for statistical shape modelling from images.

Relevant Coursework: Computer Vision, Machine Learning , Deep Learning, Natural Language Processing, Advanced Image Processing, Graduate Algorithms, Operating Systems

### Bachelor of Technology, Engineering Physics

*Indian Institute of Technology, Roorkee*

Aug 2022 – May 2024  
*Salt Lake City, UT*

Aug 2015 – May 2019  
*Roorkee, India*

## SKILLS

Python	C#	Kotlin	TensorFlow	Git	Matlab	CSS
C++	Java	SQL	OpenCV	Unity	AWS	React
C	Javascript	PyTorch	Docker	Blender	HTML	

## WORK EXPERIENCE

### Machine Learning Engineer

*Reliance Jio Infocomm*

Oct 2021 – Aug 2022

- Developed an iterative optimization method for estimating 3D body shape and pose from a Multi-View RGB setup. Enhanced body shape estimates by 30% using differential rendering.
- Led the design of character scene interaction models, enabling agents to execute basic human motions based on input control signals.
- Increased dataset scalability by 40% and reduced manual annotations by developing a Blender module for synthetic data generation for 3D vision tasks utilizing Blender's Python API.

### Software Engineer - Computer Vision

*AjnaLens*

Jun 2019 – Sep 2021

- Facilitated seamless development on the AjnaLens AR Headset by developing a cross-platform Unity SDK featuring robust SLAM integration, enhanced visual rendering, and efficient input handling.
- Enhanced Spatial Mapping capabilities of the AR Headset by contributing to the development of a mesh-based reconstruction module from depth data.
- Extending the capabilities of AR Headset for spatial understanding and monocular RGB based 6D object pose estimation.

## RESEARCH EXPERIENCE

### Graduate Research Assistant

*Scientific Computing and Imaging Institute, University of Utah*

Aug 2022 - July 2024

- Developed a deep learning architecture for Multi-Object Statistical Shape Modelling from 3D Volumetric Images, distinguished as the first to offer correspondences in image space.
- Conducted a comprehensive study to explore the effectiveness of semi-supervised and unsupervised segmentation methods, alongside foundational segmentation models, for Statistical Shape Modeling.
- Designed a deep learning framework for Shape Localization and Statistical Shape Modelling from 3D Volumetric Images, resulting in increased Shape Modelling accuracy by 15%.

### Research Assistant

*Multimodal Perception Lab, IIIT Bangalore*

Jun 2020 – Jan 2022

- Constructed an image to image translation model based on pix2pixHD, using Pose Heatmap as intermediate pose representation for sign transfer (pose) between different subjects.
- Formulated an approach to enhance hand outputs by introducing a dedicated hand generator, considering the motion continuity, and incorporating a refinement network to optimize structural integrity.

## TEACHING EXPERIENCE

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### Fundamental of Text Processing

Spring 2024

*Department of Biomedical Informatics, University of Utah*

- Assisted professor in leading discussion sections, designing assignments and grading class participation for the graduate level course on Natural Language Processing in Biomedical domain.

## PUBLICATIONS

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- Janmesh Ukey, Tushar Kataria, and Shireen Y. Elhabian. MASSM: An end-to-end deep learning framework for multi-anatomy statistical shape modeling directly from images, *arXiv preprint arXiv:2403.11008* (Accepted - ShapeMI, MICCAI)
- J. Ukey and S. Elhabian. Localization-aware deep learning framework for statistical shape modeling directly from images. In *Medical Imaging with Deep Learning*, 2023
- Krishna S\*, Janmesh U\*, Jayagopi D. "GAN Based Indian Sign Language Synthesis", 12th *Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, Jodhpur, India, December 2021.
- J. S. K. Patibandla, S. K. Adhikary and J. Ukey, "Augmented Reality for Assistive Maintenance and Real-Time Failure Analysis in Industries," 2020 2nd *International Conference on Innovative Mechanisms for Industry Applications (ICIMIA)*, Bangalore, India, 2020, pp. 149 - 153.

## PROJECTS

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### Scene Text Recognition

Fall 2023

*guided by - Prof. Vivek Srikumar, Associate Professor, University of Utah*

- **Aim** - Developing a Deep Learning framework to extract text from images.
- Designed a neural network architecture that utilizes a Vision Transformer as an encoder and LSTM as a decoder for scene text recognition.
- Designed a neural network architecture that utilizes a Vision Transformer as encoder and a pretrained language model (BERT-Mini) as decoder for scene text recognition.

### Road Object Detection

Spring 2023

*guided by - Prof. Tolga Tasdizen, Professor, SCI Institute, University of Utah*

- **Aim** - Implement Road Object Detection for Autonomous Vehicle Navigation.
- Developed a two-stage Faster R-CNN-based neural network architecture for object detection and evaluated the performance across different backbones.
- Developed a one-stage Retina-Net based neural network architecture for object detection and evaluated the performance across different backbones.

### High Performance Computing

Jan 2019 - April 2019

*guided by - Prof. Arumugam Paramasivan, Associate Professor, IIT Roorkee*

- **Aim** - Explore how parallel computation can help in solving complex physics problems.
- Designed an algorithm based on Nilsson Model, to calculate single energies of a particle as a function of deformation.
- Used OpenMPI and python parallelisation modules to explore various ways of computing in parallel and decrease the computational time of the complex Nilsson Model problem.
- Investigated the performance of different parallel algorithms for Nilsson Model problem on different machines (Intel Xeon 64 cores, Intel i9 8 cores and Intel i5 4 cores).