

# Rohan Chacko

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Seeking Computer Vision internships for Summer 2022

## EDUCATION

### Carnegie Mellon University

Dec 2022 (Expected)

Master of Science in Computer Vision

### International Institute of Information Technology (IIIT-H), Hyderabad, India

May 2021

Bachelor of Technology in Computer Science & Engineering (Honors in Computer Vision) - GPA: **9.13/10**

- Part of Dean's List for academic excellence. Awarded to top 5% out of 210 students.
- Teaching Assistant for Computer Vision, Computer Systems Organisation, Data & Applications.
- Selected Coursework: Statistical Methods in AI, Digital Image Processing, Probabilistic Graphical Models, Optimisation.

## EXPERIENCE

### Centre for Visual Information Technology, IIIT-H, India

Aug 2019 – May 2021

Research Assistant. Advisor: Prof. P.J. Narayanan, Prof. Avinash Sharma

- Formulated a novel shape representation for monocular 3D human body reconstruction.
- Developed an end-to-end CGAN pipeline in PyTorch which was 18.8% more accurate (Chamfer distance) and 2× faster at inference time than prior state-of-the-art. Work resulted in a 3DV 2020 publication. Pending patent.
- Extended the method to reconstruct humans with extremely loose clothing styles by fusing SMPL priors with non-parametric shape predictions. Method was 52.96% more accurate (P2S distance) than prior state-of-the-art.
- Implemented a ResNet-based encoder-decoder architecture in PyTorch. Work currently under journal submission.

### R-PAD Lab, Carnegie Mellon University

May 2020 – Jul 2020

Undergraduate Research Intern. Advisor: Prof. David Held

- Leveraged the MaskRCNN pipeline in PyTorch to incorporate attention mechanisms for zero-shot object segmentation.
- Quantified the performance impact of synthetic object renders as training data for class-based and class-agnostic segmentation.
- Ideated a MaskRCNN-based pipeline using FPNs and object pose distribution predictions for scale and pose invariance.

### Five Fingers Innovative Solutions, Hyderabad, India

Aug 2018 – Dec 2018

Research Intern - Computer Vision

- Led a 4-member team to develop a tracking software for medical equipment during surgical operations.
- Utilized silhouette-based template tracking methods of 3D mesh models for efficiency.
- Achieved almost real-time (18 fps) performance with scale, rotation and illumination invariance for upto 5 unique objects using only basic image processing techniques.

## PUBLICATIONS

PeeledHuman: Robust Shape Representation for Textured 3D Human Body Reconstruction. Sai Sagar Jinka, **Rohan Chacko**, Avinash Sharma, P.J. Narayanan. **International Conference on 3D Vision, 2020** [Project Page]

SHARP: Shape-Aware Reconstruction of People In Loose Clothing. Sai Sagar Jinka, **Rohan Chacko**, Astitva Srivastava, Avinash Sharma, P.J. Narayanan. *Under submission* [Arxiv]

## PROJECTS

### 3D Scene Reconstruction from accidental motion [Link]

Feb 2020 – Mar 2020

- Developed a method to utilize camera shake occurring in captured videos to reconstruct a 3D scene. Implemented Kanade-Lucas-Tomasi tracking, SfM, CRF algorithms. Tech Stack: OpenCV, Python/C++.

### Image Reflection removal using ghosting cues [Link]

Sept 2019 – Nov 2019

- Applied the concept of ghosted reflections using a double-impulse convolution kernel on a single input image to remove reflections.
- Utilized a Gaussian mixture model prior over image patches to regularise the optimization. Tech Stack: MATLAB.

### Mobile ad-hoc networks for disaster relief [Link]

Sept 2018 – Nov 2018

- Developed a MANET application that enables geo-location sharing to aid relief efforts during natural disasters.
- Implemented a mobile network simulation where devices within a network can share location using nearby bluetooth/WiFi hotspots. Tech Stack: Java, Django.
- Won **second place** for the **Microsoft India CodeFunDo 2018** hackathon.

## TECHNICAL SKILLS

**Programming Languages:** Python, C/C++, MATLAB, SQL

**ML/CV Libraries:** PyTorch, Tensorflow, OpenCV, Scikit-learn

**Miscellaneous:** Blender, Meshlab, Open3D, NumPy, Git