SHASHANK **TRIPATHI**

PhD candidate, MPI Tübingen, Germany
shashank.tripathi123@gmail.com | +49 17627432172
https://sha2nkt.github.io

EDUCATION

Max Planck Institute for Intelligent Systems, Tübingen — Germany
PhD Computer Science; Meta Research PhD Fellow 2023 (21/3200 applicants) — Feb 2021 – present
Advisor: Prof. Michael Black

Carnegie Mellon University, School of Computer Science — Pittsburgh, USA
Master of Science in Computer Vision (MSCV) — Dec 2018
GPA: 4.15/4.33, Advised by Prof. Kris Kitani

Birla Institute of Technology and Science (BITS), Pilani — Hyderabad, India
Bachelor of Engineering with Honors in Electronics and Communication Engineering, Minor in Finance — July 2016
GPA: 9.16/10 (top 2% among 1500 students, Merit scholarship recipient)

PUBLICATIONS

· ***PICO: Reconstructing 3D People In Contact with Objects*** https://pico.is.tue.mpg.de
S Tripathi, A Cseke, S Dwivedi, A Lakshmipathy, M J Black, D Tzionas. CVPR 2025

· ***InteractVLM: 3D Interaction Reasoning from 2D Foundational Models*** https://interactvlm.is.tue.mpg.de/
S Dwivedi, D Antić, S Tripathi, O Taheri, C Schmid, M J Black, D Tzionas. CVPR 2025

· ***HUMOS: Human Motion Model conditioned on Body Shape*** https://carstenepic.github.io/humos
S Tripathi, O Taheri, C Lassner, M J Black, D Holden, C Stoll. ECCV 2024

· ***DECO: Dense Estimation of 3D Human-Scene Contact in the Wild*** https://deco.is.tue.mpg.de
S Tripathi, A Chatterjee, J Passy, H Yi, D Tzionas, M J Black. ICCV 2023 (oral)

· ***EMOTE: Emotional Speech-Driven Animation with Content-Emotion Disentanglement***
R Danecek, K Chhatre, S Tripathi, Y Wen, M Black, T Bolkart. SIGGRAPH Asia 2023 https://emote.is.tue.mpg.de

· ***3D Human Pose Estimation via Intuitive Physics***
S Tripathi, L Muller, C P Huang, O Taheri, M J Black, D Tzionas. CVPR 2023 https://ipman.is.tue.mpg.de

· ***BITE: Beyond Priors for Improved Three-D Dog Pose Estimation***
N Rüegg, S Tripathi, K Schindler, M J Black, S Zuffi. CVPR 2023 https://bite.is.tue.mpg.de

· **MIME: Human-Aware 3D Scene Generation**
H Yi, C P Huang, S Tripathi, L Hering, J Thies, M J Black. CVPR 2023 https://mime.is.tue.mpg.de

· ***PERI: Part Aware Emotion Recognition In The Wild***
A Mittel, S Tripathi. ECCVW 2022 https://cvml.page.link/peri

· ***Occluded Human Mesh Recovery***
R Khirodkar, S Tripathi, K Kitani. CVPR 2022 https://cvml.page.link/ochmr

· ***AGORA: Avatars in Geography Optimized for Regression Analysis***
P Patel, P C Huang, J Tesch, D T Hoffman, S Tripathi, M J Black. CVPR 2021 https://cvml.page.link/agora

· ***PoseNet3D: Unsupervised 3D Human Shape and Pose Estimation***
S Tripathi, S Ranade, A Tyagi, A Agarwal. *3DV 2020* (oral) https://cvml.page.link/pose

· ***Learning to Generate Synthetic Data via Compositing***
S Tripathi, S Chandra, A Agarwal, A Tyagi, J Rehg, V. Chari. *CVPR 2019* https://cvml.page.link/learn

· ***C2F: Coarse-to-fine Vision Control System for Automated Microassembly***
S Tripathi, D Jain, H Sharma. *Nanotechnology and Nanoscience Asia, 2018* https://cvml.page.link/c2f

· ***Sub-cortical morphology and voxel based features for Alzheimer's disease classification***
S Tripathi, SH Nozadi, M Shakeri, S Kadoury. *ISBI 2017* https://cvml.page.link/shape

· ***Deep spectral-based shape features for Alzheimer's Disease classification***
M Shakeri, H Lombaert, S Tripathi, S Kadoury. *MICCAI-SESAMI, 2016* https://cvml.page.link/spec

PATENTS

· **Three-dimensional pose estimation.**
S Tripathi, S Ranade, A Tyagi, A Agarwal. *US Patent 11526697*

· ***Generation of synthetic image data using three-dimensional models.***
S Tripathi, S Chandra, A Agarwal, A Tyagi, J Rehg, V. Chari. *US Patent 10909349*

· ***Generation of synthetic image data for computer vision models***
S Tripathi, S Chandra, A Agarwal, A Tyagi, J Rehg, V. Chari. *US Patent 10860836*

RESEARCH EXPERIENCE

HUMOS: Human Motion Model conditioned on Body Shape — Jun 2023 – Dec 2023
Advisor: Carsten Stoll, Daniel Holden, Christoph Lassner, Michael Black — Epic Games, San Francisco
· Built HUMOS, a self-supervised human motion model conditioned on body shape – trained with novel cycle consistency, intuitive physics and stability constraints

DECO: Dense Estimation of 3D Human-Scene Contact in the Wild — Nov 2022 – Mar 2023

Advisor: Dimitrios Tzionas, Michael Black MPI-IS, Tubingen

· Collected DAMON, a large-scale dataset with dense vertex-level 3D contact annotations for in-the-wild human-object interactions

· Trained DECO, a novel regressor that predicts vertex-level 3D contacts on a body from a single RGB image

3D Human Pose Estimation via Intuitive Physics Dec 2021 – Nov 2022

Advisor: Dimitrios Tzionas, Michael Black MPI-IS, Tubingen

· Proposed novel biomechanically inspired intuitive physics terms that are simple, differentiable and compatible with parametric body models such as SMPL/SMPLX

· Demonstrated that incorporating differentiable physics improves 3D human pose estimation

· Collected Mocap data with extreme poses to test our approach in challenging scenarios

Occluded Human Mesh Recovery Aug 2021 – Dec 2021

Advisor: Kris Kitani *CMU*

Proposed a novel top-down mesh recovery architecture capable of leveraging image spatial context for handling multi-person occlusion and crowding

AGORA: Avatars in Geography Optimized for Regression Analysis Aug 2020 – Dec 2020

Advisor: Michael Black MPI-IS, Tubingen

· Developed a 3D human shape and pose estimation model trained on synthetic data that generalizes to real scenes using various 2D and 3D losses

PoseNet3D: Unsupervised 3D Human Shape and Pose Estimation Feb 2019 – Nov 2019

Collaborators: Amit Agarwal, Ambrish Tyagi *Amazon Lab126*

· Proposed self-consistency and adversarial losses to train a novel unsupervised model to estimate 3D human pose from RGB videos

· Solved issues such as occlusion, domain-gap and temporal jitter leading to realistic and smooth 3D sequence reconstructions on multiple in-the-wild video datasets

Learning to Generate Synthetic Data via Compositing May 2018 – Nov 2018

Advisors: James Rehg, Amit Agrawal, Ambrish Tyagi *Amazon Lab126*

· Proposed a network for generating novel composite images that retain scene context and realism

· Developed algorithms for efficient training of object detection and image classification models on synthetic composite data, using an online hard-positive mining approach

· Improved baseline Faster-RCNN mAP by 3.5% and baseline SSD mAP by 2.7% on various datasets.

Deep Spectral-based Shape Features for Alzheimer's Disease Classification Feb 2016 – Jul 2016

Undergraduate Thesis, Advisor: Samuel Kadoury *Univ. of Montreal*

· Developed an unsupervised framework for classification of Alzheimer's disease patients using noisy T1-weighted MRI brain images

· Proposed a combination of grey-matter voxel-based intensity variations and 3D structural (shape) features parameterized with a spherical-harmonics representation

· Results presented near state-of-the-art accuracies (>89%) – outperformed conventional MRI shape-based strategies by 22%-27%

C2F: Coarse-to-Fine Vision Control System for Automated Microassembly May 2014 – Dec 2014

Advisor: H D Sharma *Central Electronics Engineering Research Institute, Pilani*

· Developed a completely automated, visual-servoing based closed loop system to perform 3D micromanipulation and microassembly tasks

· Results led to a ~75% reduction in setup and run time as compared to manual operation, while mitigating any risk of collision during grasp-and-drop experiments

SCHOLARSHIPS AND AWARDS

- Selected for the Doctoral Consortium at CVPR 2025 (35 accepted participants) 2025
- Winner of the Meta Research PhD Fellowship Award 2023 (21/3200 applicants) 2023
- Best business model and best pitch, Cyber Valley Startup Incubation Program 2022, Germany for our startup "YOGI – a virtual yoga classroom" 2022
- IISc Bangalore Summer Research Fellowship – top 20 across India 2015
- *Best Technical Association Award,* BITS-Pilani 2014
- Tournament Winner, Cricket, Arena'13 National Sports Festival 2013
- Undergraduate MERIT scholarship, BITS Pilani – top 2% students 2012
- Founder President's Scholarship, Amity International – top student for 6 years 2011
- Junior Science Talent Search Examination (JSTSE) Scholarship – Ranked 22 in 20,000 applicants 2008
- Outstanding Reviewer Award – ECCV 2020, CVPR 2025

ACADEMIC DUTIES

Organizer – RHOBIN Workshop, CVPR 2024, CVPR 2025 https://rhobin-challenge.github.io
- 36 participating teams and 142 submissions. Top 7 methods established new state-of-the-art [CVPR 2024]

Organizer – 3D HUMANS Workshop, CVPR 2024, CVPR 2025 https://sites.google.com/view/3d-humans-cvpr2025
Reviewer – CVPR (2025, 2024, 2022, 2021, 2020), ICCV (2023, 2021), ECCV 2020, BMVC 2022, PG 2024
Session Chair – International Max Planck Research Schools (IMPRS) Interview Symposium, 2024

TALKS

AI Talks, National Technological University (NTU), Singapore 28 Mar 2024
Physics-informed Modelling of Dynamic Humans and their Interactions

PROFESSIONAL EXPERIENCE

Meta Zurich, Switzerland
Research Intern Oct 2024 – Mar 2025
Built a multi-modal large foundation model for grounding human activities within 3D scene and enabling advanced spatial reasoning queries using egocentric inputs from a head-mounted device

Epic Games San Francisco, USA
Research Intern June 2023 – Dec 2023
Build a novel motion model, HUMOS, capable of generating natural, physically-plausible and dynamically stable human motions given a target body shape

Amazon Sunnyvale, USA
Applied Scientist II (AS-II) (*promoted from AS-I in Sep 2020*) Feb 2019 – Feb 2021
Improved 3D human activity reconstruction from 2D videos for enhancing action recognition/detection. Supported Computer Vision algorithm development for the new Echo Show. Worked on virtual try-on and body measurement estimation from images.

Amazon Lab126 Cupertino, USA
Applied Scientist Intern May 2018 – Aug 2018
Worked on task-aware generation of synthetic image composites for training deep networks

Franklin Templeton Investments Hyderabad, India
Summer Intern | Project: Financial Modelling for Tactical Asset Allocation May 2015 – Aug 2015
Built machine-learning models for capturing statistical associations like lead-lag correlation and one directional causality which achieved a 12% improvement in hit-rate for forecasting yield-spreads (US-OAS)

TEACHING EXPERIENCE

Teaching Assistant – 16-720: Computer Vision, Prof. Kris Kitani Fall 2018, CMU
Head Teaching Assistant – 16-385: Computer Vision, Prof. Ioannis Gkioulekas Summer 2018, CMU

MENTORING

Alpar Cseke Masters at University of Tübingen → Research Engineer at Meshcapade (2023 – Now)
Agniv Chatterjee Bachelors at Jadavpur University → Ph.D. at UT Austin (Georgios Pavlakos) (2022 – 2023)

RELEVANT COURSES

16-826 Visual Learning and Recognition, CMU
16-822 Geometry Based Methods in Vision, CMU
16-720 Computer Vision, CMU
10-601 Introduction to Machine Learning, CMU
16-811 Mathematical Fundamentals for Robotics, CMU

ACADEMIC PROJECTS

Learning Scene Saliency Maps Using Superpixel-augmented Convolutional Neural Networks Aug 2017 – Dec 2017
· Extracted SLIC superpixel segmentations as input to a Siamese CNN, achieving 4x faster training times with improved spatial context and accuracy in output saliency maps

Towards Integrating Model Dynamics for Sample Efficient Reinforcement Learning Jan 2017 – May 2017
· Learned a dynamics model of the world by assuming domain-specific priors on real-world episodes. Used the learned dynamics model to augment real-world episodes as the training progressed
· Established that augmenting real-world data using an approximate world-model tends to be significantly more sample efficient than naïve model-free reinforcement learning

LEADERSHIP

- Member, External Affairs Committee (Graduate Student Assembly), CMU
- Secretary, Electrical and Electronics Association, BITS Pilani
  Led a team of 37 members. Organised 25 major events, 6 during the technical festival
- Computer Vision Mentor**,** Student Mentorship Program (SMP), BITS Pilani
  Conducted evening classes for teaching 30 junior batch students
- Represented BITS Pilani cricket team in inter-college cricket tournaments and sports festivals
- Organizer of National Seminar on Indian Space Technology (NSIST-2014)

EXTRA-CURRICULAR

- Teaching volunteer at Nirmaan – BITS Pilani | www.nirmaan.org Mar 2014 – Dec 2015
- Teaching volunteer at LaSalle Boys and Girls Club, Montreal | www.bgclasalle.com Mar 2016 – Jul 2016
- Teaching volunteer at Amitasha – Teaching the girl child | www.amity.edu/amitasha Mar 2009 – Mar 2010