SHASHANK **TRIPATHI**

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EDUCATION

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

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

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

PUBLICATIONS

· *PICO: Reconstructing 3D People In Contact with Objects*
 S Tripathi, A Cseke, S Dwivedi, A Lakshmipathy, M J Black, D Tzionas. CVPR 2025

· *InteractVLM: 3D Interaction Reasoning from 2D Foundational Models*
 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*
 S Tripathi, O Taheri, C Lassner, M J Black, D Holden, C Stoll. ECCV 2024   https://carstenepic.github.io/humos

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

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

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

- 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

ACADEMIC DUTIES	Organizer – RHOBIN Workshop, CVPR 2024, CVPR 2025	https://rhobin-challenge.github.io

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

Outstanding Reviewer Award – ECCV 2020

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