Jeff Tan

CONTACT

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA
M.S. in Robotics (Research Thesis, GPA 4.17/4.33) 08/2023 - 08/2025
- Advisor: Prof. Deva Ramanan

Carnegie Mellon University, Pittsburgh, PA
B.S. in Computer Science (GPA 3.96/4.00) 08/2019 - 05/2023
- Thesis: *Distilling Neural Fields for Real-Time Articulated Shape Reconstruction*
- Concentration in Computer Graphics, Computer Systems, Algorithms

PUBLICATIONS

Why is Sparse-View 4D Reconstruction Hard?.
Zihan Wang, **Jeff Tan**, Tarasha Khurana, Neehar Peri, Deva Ramanan.
Under Review, 2025. [Paper]
- Given sparse-view egocentric and exocentric video as input, we reconstruct geometry and motion of everyday activities such as healthcare, bike repair, and sports.

DiffusionSfM: Predicting Structure and Motion via Ray Origin and Endpoint Diffusion.
Qitao Zhao, Amy Lin, **Jeff Tan**, Jason Y. Zhang, Deva Ramanan, Shubham Tulsiani.
Under Review, 2025. [Website] [Paper]
- Given a sparse set of images as input, we build an end-to-end diffusion framework that performs multi-view reasoning alongside dense per-image pointmap estimation.

DressRecon: Freeform 4D Human Reconstruction from Monocular Videos.
Jeff Tan, Donglai Xiang, Shubham Tulsiani, Deva Ramanan, Gengshan Yang.
3DV, 2025 (Oral). [Website] [arXiv] [Github]
- From a single monocular video, we reconstruct humans in loose clothing and interacting with objects, using a hierarchical deformation field and image-based priors.

Distilling Neural Fields for Real-Time Articulated Shape Reconstruction.
Jeff Tan, Gengshan Yang, and Deva Ramanan.
CVPR, 2023. [Website] [Paper] [Github]
- We learn real-time feed-forward pose and shape predictors, by distilling knowledge from offline differentiable rendering optimizers.

Using Deep Learning Sequence Models to Identify SARS-CoV-2 Divergence.
Yanyi Ding, Zhiyi Kuang, Yuxin Pei, **Jeff Tan**, Ziyu Zhang, and Joseph Konan.
arXiv, 2021. [arXiv]

AWARDS

NSF Graduate Research Fellowship 2023 - 2028

CMU Alumni Award for Undergraduate Excellence 2023

CMU Summer Undergraduate Research Fellowship 2021

RESEARCH EXPERIENCE

Carnegie Mellon University, Center for Autonomous Vehicle Research
Graduate Student Researcher (Advisor: Prof. Deva Ramanan) 08/2023 - Present
- Reconstruct dynamic 3D humans with loose clothing and handheld objects from a single video
- Large-scale, photorealistic 3D site modeling from aerial and ground imagery (IARPA WRIVA)
- Explore 4D reconstruction of skilled human activities from sparse multi-view video

- Explore pretrained diffusion models for pointmap estimation from image pairs
- Explore mesh-based neural surfaces by revisiting classic differentiable rendering (e.g. SoftRas)

Carnegie Mellon University, Center for Autonomous Vehicle Research
Undergraduate Researcher (Advisor: Prof. Deva Ramanan) 02/2022 - 08/2023
- Train real-time feed-forward shape, pose, and appearance predictors by distilling offline-optimized dynamic NeRFs for object categories
- Improve efficiency of 4D reconstruction from casual monocular video collections

TEACHING

Carnegie Mellon University, Pittsburgh, PA
- Teaching Assistant, Physics-Based Rendering (15-468) Spring 2023, Spring 2024
- Teaching Assistant, Parallel Computation (15-418) Fall 2021, Spring 2022, Spring 2023
- Teaching Assistant, Introduction to Computer Systems (15-213) Fall 2021

WORK EXPERIENCE

Bodo AI 05/2022 - 08/2022
Software Engineer Intern, Pittsburgh, PA 02/2023 - 08/2023
- Develop a JIT compiler that auto-parallelizes Python and SQL code by emitting low-level MPI, speeding up massive data processing jobs by orders of magnitude on parallel clusters.

KLA Corporation
Algorithms Intern, Ann Arbor, MI 05/2021 - 08/2021
- Train physics-informed neural networks for solving forward and inverse problems involving PDEs, towards photolithography simulations.

SOFTWARE

Lab4D: A framework for in-the-wild 4D reconstruction from monocular videos.
Gengshan Yang, **Jeff Tan**, Alex Lyons, Neehar Peri, Deva Ramanan.
[Github] [Docs]
A Python library for 4D reconstruction of humans, animals, and scenes from monocular videos.

COURSE PROJECTS

Natural Dexterous Piano Playing at Scale With Video Hand Priors.
Jeff Tan, Yuanhao Wang, Haoyang He.
[Report]
We control dexterous simulated robot hands to play piano, using Internet videos of human pianist demonstrations.

Cleaning Casually Captured Splatting Scenes with Diffusion Priors.
Jeff Tan, Bhuvan Jhamb, Joel Julin, Roshan Roy.
[Report]
We fine-tune image-conditioned diffusion models to simultaneously remove ghostly artifacts and infill plausible geometry at novel views.

Physically Based Renderer.
Jeff Tan.
[Report]
A physics-based renderer for photorealistic images that supports Monte Carlo path tracing, physically realistic materials, bidirectional path tracing, and volume rendering.

C0 Compiler.
Jeff Tan, Rachel Yuan.
[Report]
A compiler for a type-safe subset of C, outperforming `gcc -O1` by 36.9% on average on CMU 15-411's benchmark suite.

SKILLS

Programming: Python, C++, C, OCaml, JavaScript, x86 Assembly

Software: PyTorch, JAX, NumPy, CUDA

Languages: English (native), Chinese (fluent)

Citizenship: United States

COURSEWORK

Carnegie Mellon University, Pittsburgh, PA

- *Vision*: Computer Vision (16-720), Learning-Based Image Synthesis (16-726), Visual Learning and Recognition (16-824), Learning for 3D Vision (16-825)
- *Robotics*: Robot Learning (16-831), Mobile Robots (16-761)
- *Graphics*: Computer Graphics (15-462), Computational Photography (15-463), Physics-Based Rendering (15-468)
- *Systems*: Computer Systems (15-213), Computer Security (15-330), Compiler Design (15-411), Parallel Computer Architecture and Programming (15-418), Database Systems (15-445)
- *Theory*: Complexity Theory (15-445), Discrete Differential Geometry (15-458), Cryptography (15-356), Quantum Computation (15-459)
- *Other*: Programming Languages (15-312)