Tianhao (Walter) Wu

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EDUCATION

University of Cambridge 2021 - Now

PhD Computer Science: expected 2025

Research Interests: 3D computer vision, neural implicit representation, 3D reconstruction, scene understanding, NeRF, graphics, inverse rendering, neural avatar

University College London (UCL) 2017 - 2021

MEng Computer Science

First Class Honours (Average 84%)

Dean's List Award: to students graduated with outstanding academic performance

PROGRAMMING

- **ML Platforms**: TensorFlow, PyTorch, Jax (Flax).
- **Programming**: Python, C++, C, CUDA.

RESEARCH HIGHLIGHTS

Gaussian Head & Shoulders (ICLR 2025) Jan – Sep 2024

- **Gaussian Splatting Neural Avatar**: neural upper body avatar via dynamic Gaussian Splatting for 130 FPS rendering speed
- **High-Frequency Texture**: improve performance in modelling high frequency cloth texture via 2D neural texture constrained using novel Anchor Gaussians.

αSurf (3DV 2025) Jun 2022 – March 2023

- **Translucent Surface Reconstruction from Images**: reconstruct semi-transparent and intricate surfaces from multi-view RGB images.
- **Novel Surface Representation**: level sets of voxelated scalar fields with opacity to model surfaces with translucent or blending effects.
- **Differentiable Rendering**: ray-surface intersection through cubic root-finding algorithms to support naturally differentiable rendering.

D²NeRF (NeurIPS2022) Nov 2021 – May 2022

- **Dynamic Scene Reconstruction**: reconstruct non-rigid scenes from monocular video via NeRF with a deformation field.
- **Scene Decomposition**: decouple 3D scene into dynamic & static without any mask supervision, and hence can work on moving shadows or pouring liquid.

Neural Radiance Caching++ Nov 2022 – Jan 2024

- **Real-Time Global Illumination**: leveraging coordinate-based MLP and hash-grid for real-time rendering of global illumination.
- **Motion-Awareness & Smoothness**: incorporating motion vector and Lipschitz constraint to improve convergence.

WORK

Meta Reality Labs Internship Jun – Oct 23, Jun – Oct 24

- **Neural Avatar**: surveyed various methods covering 3DMM, NeRF, GANs to identify promising directions for neural avatar.
- **Neural Body Avatar**: supporting neural avatar model with hand gesture modelling and control via a StyleUNet architecture. Landed several commits to production code base and recognized for exceptional performance.

PhenoEye (Agritech Startup) Jun 2024 –Now

- **Startup**: establishing a startup company on 3D scanning and phenotyping for agriculture.
- **Lincam Ceres Funded:** received £120K funding form Ceres for starting as a small project.

UCL Research Internship July – Sep 2020

- **One-Shot 3D Reconstruction**: worked on *DualNeRF*, a one-shot reconstruction NeRF.

Software Engineering Internship Jun – Aug 2019

- **Software Engineering**: developed a mobile app and learned good coding practices.

OTHER PROJECTS

Constrained Network (NeurIPS 2023) March – May 2023

- **Neural Field with Hard Constraint**: enforce hard constraints on linear operations of neural field and its derivatives.
- **Material Appearance Fitting**: apply the method in BRDF fitting task and achieve high accuracy around specular highlights.

Kubric (CVPR2022) Oct – Nov 2021

- **Data Generation**: cooperated with researchers from Google and top universities to build an easy-to-use synthetic data generation pipeline.

AWARDS

Lincam Ceres Award for Small Project 2024

- Received £120K funding for our startup PhenoEye -- 3D scanning and phenotyping for agriculture in the UK.

GCYLP Fellowship 2024

- Received fellowship from Generation Connect Young Leadership Programme at International Telecommunication Union (ITU), United Nations
- Working on impactful and sustainable business for equal technology opportunities.

Google Hash Code – UK Ranking 21st 2019

- Achieved highest ranking at UCL and 449th globally.