Walter Wu

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EDUCATION

University of Cambridge 2021 - Now

PhD Computer Science

Research Interests: 3D computer vision, neural implicit representation, 3D reconstruction, scene understanding, NeRF

University College London (UCL) 2017 - 2021

MEng Computer Science

First Class Honours (Average 84%)

Dean's List Award

RESEARCH

Voxel-SDF Jun 2022 – Now

- **Efficiency**: enabling fast training and rendering of radiance field by incorporating explicit voxels.
- **Exact Geometry**: replacing the volumetric field with trilinearly interpolated signed distance to surface.

D²NeRF (NeurIPS2022) Nov 2021 – May 2022

- **Scene Decomposition**: decouple 3D scene into dynamic & static based on a monocular RGB video without any mask supervision.
- **Shadow Handling**: density-less shadow field to correctly decouple dynamic object shadow.

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.
- **Surface Reconstruction**: generated datasets with varying properties including difficult topology, non-textured surface, non-rigid motion to challenge existing surface reconstruction methods.

DualNeRF Sep 2020 – Apr 2021

- **3D Reconstruction**: incorporated multi-view consistency and local feature extraction to achieve single view reconstruction.
- **Global/Local Separation**: a local decoder conditioned on pixel-wise local feature and a global decoder conditioned on global feature.

PUBLICATIONS

- *D2NeRF: Self-Supervised Decoupling of Dynamic and Static Objects from a Monocular Video*
- *Kubric: A scalable dataset generator*

TECHNICAL SKILLS

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

WORK EXPERIENCE

Uni of Cam Supervisor/Ticker Oct 2021 – April 2022

- **Teaching**: supervised students of the Further Graphics and Intro to Graphics module.

UCL Research Internship July – Sep 2020

- **Computer Vision**: carried out research in UCL Vision and Imaging Science group.
- Worked on *DualNeRF*.

Software Engineering Internship Jun – Aug 2019

- **Software Engineering**: worked in a SE team to learn good coding practices and developed a mobile app with DevOps.

PROJECTS

Influenza Prediction Python (TensorFlow, SK Learn)

- **Time Series Forecasting**: developed a machine learning model to predict infection rate of Influenza-like-illness (ILI).
- **Text Auxiliary**: provided frequencies of Google queries that contain ILI keywords as side information to the model to improve performance.

Therapy Game Unity, C#

- **Unity Game**: worked with Microsoft Research to develop a therapy game that helps Cystic Fibrosis patients to take repetitive therapies.

AWARDS

CAPA 2022

- One of the 7 best engineering-related proposals in Cambridge.

UCL Dean's List Award 2021

- Awarded to students with outstanding academic performance.

Google Hash Code – UK Ranking 21st 2019

- Best in UCL. Global ranking 449th.

Duke of Edinburgh Bronze Award 2017

- Participated in a series of skill learning, volunteering, and expedition.