SHUN-CHENG WU

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EDUCATIONAL BACKGROUND

Technische Universität München, Ph.D. Candidate — **Germany**, 02/2019-now
- Research area: 3D computer vision, 3D scene reconstruction and understanding, 3D semantic scene graphs.

Loughborough University, Master of Science in Mechanical Engineering — **The United Kingdom**, 09/2015~12/2016
- Professor Peter Nevitt Prize winner (Best individual project)
- Graduated with distinction
- Thesis: **Design and build a reconfigurable 3D measurement system**

Tamkang University, Bachelor of Mechanical and Electro-Mechanical Engineering — **Taiwan**, 09/2009~06/2013
- Research Creativity Award from the National Science Council in Taiwan
- Thesis: **Particle Filter-Based Visual SLAM Using Low-End Cameras**

WORKING EXPERIENCE

Research Associate, TUM CAMP chair — **Germany**, 02/2022~02/2023
- Working as a senior research associate in Stryker project for 4D semantic understanding in operating rooms.
- Main organizer or Semantic Scene Graph group
- Research on 3D scene reconstruction and understanding. Real-time scene understanding.
- Supervising several research projects, lab courses, seminars, and master theses.

Research Associate, TUM CAMP chair — **Germany**, 02/2019-02/2022
- DFG project: **Adaptive Walking through Multi-Contact Stabilization.** (video: https://youtu.be/ovG2Rz9-1p8)
- Research on 3D scene reconstruction and understanding. Real-time scene understanding.
- Supervising several research projects, lab courses, seminars, and master theses.

Software Research Engineer, Pointu3D GmbH, start-up project, Technical University of Munich — **Germany**, 06/2018-11/2018
Designing a system for direct interaction with objects in Augmented reality
- Improving the stability and robustness of a dense SLAM system to reach commercial usage level.
- Improving the reconstruction detail in both scenes and object reconstruction.

Visiting Researcher, Technical University of Munich — **Germany**, 08/2017-05/2018
Deep Learning on Learned Local Reference Frame and on 3D local feature descriptor
- Learning a canonical pose for local 3D surfaces in order to improve the performance of 3D descriptors.
- End-to-end learning of the feature descriptor of 3D points using deep learning approaches.

Stamping Dies Associate Engineer, Lian Chuan Shing International Co., Ltd. — **Taiwan**, 01/2017~08/2017
- Design and develop compound dies and progressive dies
- Assembly, disassembly, and repair dies
- Dies management

Master Thesis, Loughborough University — **The United Kingdom**, 09/2015~12/2016
Design and build of a Reconfigurable 3D measurement system
- Designing and building a reconfigurable measurement system for precisely and accurately reconstructing objects on producing lines. Involving computer vision and structure design.

Bachelor Thesis, Tamkang University — **Taiwan**, 09/2009~06/2013
Particle Filter-Based Visual SLAM Using Low-End Cameras
- Using stereo vision and particle filters to perform camera tracking and environment mapping on commercial webcams.

TEACHING EXPERIENCE

Course Tutor, TUM — **Germany**
- Seminar: Computer Vision and Deep Learning for Autonomous Driving 2019~2023
- Seminar: Recent Trends in 3D Computer Vision and Deep Learning 2019~2023
- Lab Course: Computer Perception and Learning in Robotics and Augmented Reality 2020~2023
- Lab Course: Advanced Topics in 3D Computer Vision 2021~2023

Master thesis, TUM — **Germany**
- Realtime scene reconstruction with radiance fields using spherical harmonic 2022~2023

- Meaningful part segmentation in Indoor Scene 2022~2023
- Towards a Long-Term Visual Localization Method in Indoor Environments with Changes 2021~2022
- Visual-LiDAR Instance-Level Mapping 2020~2021
- 3D inpainting with Semantic Scene Completion 2020~2021
- A study of existing self-supervised depth estimations 2019~2021

Guided Research, TUM **Germany**
- Learning Scene Representation with Knowledge Distillation from Sequential Data 2022
- Neural Implicit Scene Reconstrucion for 3D Perception 2022~2023

SELECTED PUBLICATIONS

Dynamic Hyperbolic Attention Network for Fine Hand-object Reconstruction **ICCV**
- coming soon. 2023

Incremental 3D Semantic Scene Graph Prediction from RGB Sequences **CVPR**
- coming soon. 2023
- code available: 3DSSG

Towards Long-Term Retrieval-based Visual Localization in Indoor Environments with Changes **R-AL**
- DOI: 10.1109/LRA.2023.3242872 2023

MonoGraspNet: 6-DoF Grasping with a Single RGB Image **ICRA**
- DOI: 10.1109/ICRA48891.2023.10160779 2023

Bending Graphs: Hierarchical Shape Matching using Gated Optimal Transport **CVPR**
- DOI: 10.1109/CVPR52688.2022.01146 2022

SceneGraphFusion: Incremental 3D Scene Graph Prediction from RGB-D Sequences **CVPR**
- DOI: 10.1109/CVPR46437.2021.00743 2021
- code available: SceneGraphFusion

LOLA v1. 1–An Upgrade in Hardware and Software Design for Dynamic Multi-Contact Locomotion **Humanoids**
- DOI: 10.1109/HUMANOIDS47582.2021.9555790 2021

SCFusion: Real-time Incremental Scene Reconstruction with Semantic Completion **3DV**
- DOI: 10.1109/3DV50981.2020.00090 2020
- code available: SCFusion

LEADERSHIP EXPERIENCE

President of Student Society, Kaohsiung Group Association, Tamkang University **Taiwan**
- Led the society to be awarded the prize in Annual Society Evaluation 09/2010~06/2011

Chief Coordinator, University Annual Cultural Event Tamkang University **Taiwan**
- Coordinated 16 different regional societies for University Cultural Event 12/2010~03/2011