

Songyou Peng | Curriculum Vitae

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Education

ETH Zurich

PhD Student, Max Planck ETH Center for Learning Systems PhD Fellowship
Supervisor: Prof. Marc Pollefeys & Prof. Andreas Geiger

Zurich, Switzerland

09/2019–now

Heriot-Watt University/University of Girona/University of Bourgogne

Erasmus Mundus M.Sc in Computer Visions and Robotics (VIBOT)

09/2015–09/2017

GPA: 17/20 (rank 3/23) with distinction

Thesis: "High Quality Shape from an RGB-D Camera Using Photometric Stereo"

Supervisor: Prof. Daniel Cremers

Xi'an Jiaotong University

B.Eng in Automation, focus: artificial intelligence

Xi'an, China

08/2011–07/2015

Cumulative GPA: 83.6/100, Major GPA: 87.4/100

Experience

Google Research

Research Intern, mentor: Prof. Thomas Funkhouser

Mountain View, USA

06/2022–11/2022

- OpenScene: 3D scene understanding with open vocabularies. Accepted to CVPR 2023.

Meta Reality Labs Research

Research Intern, mentor: Dr. Michael Zollhöfer

Pittsburgh, USA (remote)

09/2021–12/2021

- Real-time neural rendering for 360-degree indoor scenes.

Agency for Science, Technology and Research (A*STAR)

Research Engineer, Institute for Infocomm Research

Singapore

10/2018–07/2019

- Performed an independent research project on universal architecture for bad-weather image restoration.
- Worked on traffic flow prediction with gated spatial-temporal CNNs and graph CNNs.

Advanced Digital Sciences Center, UIUC

Research Engineer, supervisor: Dr. Stefan Winkler, IEEE Fellow

Singapore

01/2018–03/2019

Research in affective computing.

- Developed a facial emotion analysis SDK for a 2-million SGD project.
- Published an ACM MM demo paper and an IEEE Transactions on Affective Computing paper.
- Won 1st place in vision-only task and 2nd place in overall in OMG-Emotion Challenge 2018.

Technical University of Munich (TUM)

Master Thesis, supervisor: Prof. Daniel Cremers & Dr. Yvain Queau

Munich, Germany

01/2017–07/2017

Depth Super-Resolution using photometric techniques.

- Proposed three photometric methods to obtain high-resolution depths with fine geometric details.
- One TPAMI paper and one ICCVW paper.

INRIA

Research Intern, supervisor: Prof. Peter Sturm

Grenoble, France

2016 & 2017 summer

- ICCV oral paper: designed a calibration guidance system for obtaining optimal calibration images.

INMOTION Technologies CO., LTD

Machine Vision Algorithm Intern

Shenzhen, China

07/2015–08/2015

- Approached accurate real-time person re-identification without facial information.

Selected Publications

- **Songyou Peng**, Kyle Genova, Chiyu "Max" Jiang, Andrea Tagliasacchi, Marc Pollefeys, Thomas Funkhouser, "OpenScene: 3D Scene Understanding with Open Vocabularies", **CVPR**, 2023.
- **Songyou Peng***, Zihan Zhu*, Viktor Larsson, Weiwei Xu, Hujun Bao, Zhaopeng Cui, Martin R. Oswald, Marc Pollefeys, "NICE-SLAM: Neural Implicit Scalable Encoding for SLAM", **CVPR**, 2022.
- **Songyou Peng**, Chiyu "Max" Jiang, Yiyi Liao, Michael Niemeyer, Marc Pollefeys, Andreas Geiger, "Shape As Points: A Differentiable Poisson Solver", **NeurIPS**, 2021. (**Oral, top 0.6%**)
- **Songyou Peng**, Michael Niemeyer, Lars Mescheder, Marc Pollefeys, Andreas Geiger, "Convolutional Occupancy Networks". **ECCV**, 2020. (**Spotlight, top 5%**)
- **Songyou Peng**, Peter Sturm, "Calibration Wizard: A Guidance System for Camera Calibration Based on Modelling Geometric and Corner Uncertainty". **ICCV**, 2019. (**Oral, top 4.6%**)
- **Songyou Peng***, Bjoern Haefner*, Alok Verma*, Yvain Quéau, Daniel Cremers, "Photometric Depth Super-Resolution". **TPAMI**, 2019.
- Zehao Yu, **Songyou Peng**, Michael Niemeyer, Torsten Sattler, Andreas Geiger, "MonoSDF: Exploring Monocular Geometric Cues for Neural Implicit Surface Reconstruction", **NeurIPS**, 2022.
- Michael Oechsle, **Songyou Peng**, Andreas Geiger, "UNISURF: Unifying Neural Implicit Surfaces and Radiance Fields for Multi-View Reconstruction". **ICCV**, 2021. (**Oral, top 3%**)
- Christian Reiser, **Songyou Peng**, Yiyi Liao, Andreas Geiger, "KiloNeRF: Speeding up Neural Radiance Fields with Thousands of Tiny MLPs", **ICCV**, 2021.
- Shaohui Liu, Yinda Zhang, **Songyou Peng**, Boxin Shi, Marc Pollefeys, Zhaopeng Cui, "DIST: Rendering Deep Implicit Signed Distance Function with Differentiable Sphere Tracing". **CVPR**, 2020.
- Le Zhang, **Songyou Peng**, Stefan Winkler, "PersEmoN: A Deep Network for Joint Analysis of Personality, Emotion and Their Relationship". IEEE Transactions on Affective Computing (**TAFFC**), 2019. (IF: 6.29)

Fellowships & Awards

- Max Planck ETH Center for Learning Systems PhD Fellowship 2019 – 2023
- Outstanding Reviewer of CVPR (150 out of 7000+ reviewers) 2022
- Highlighted Reviewer of ICLR 2022
- 1st place in partial object recovery in SHARP Challenge at CVPR 2022
- 1st place in vision-only task and 2nd in overall in OMG-Emotion Recognition Challenge 2018
- EU Erasmus+ mobility grant, awarded by European Union Commission 2016 & 2017
- Excellent bachelor thesis (top 5% of all graduates), XJTU 2015
- 1st in Search and Rescue Robot Challenge, California State University, USA 2010
- 2nd in Trinity College Fire Fighting Home Robot Contest, Connecticut, USA 2010
- 2nd in RoboCup Junior China Qualification Trial, Suzhou, China 2007

Invited Talks

- How do NeRF and CLIP advance 3D Scene Reconstruction and Understanding? *Bosch* 2023
- Large-Scale 3D Scene Reconstruction with NeRF. *Stanford University* 2022
- Towards Practical Applications of NeRF. *Adobe Research* 2022
- Neural Scene Representations for 3D Reconstruction. *University of Basel* 2022
- Shape As Points: A Differentiable Poisson Solver. *Talking Papers Podcast* 2022
- Towards Practical Applications of NeRF. *GAMES Webinar Series* 2021

Teaching

Teaching Assistant at ETH Zurich.....

- [252-0579-00L] 3D Vision (Lecturer: Marc Pollefeys & Daniel Barath) Spring 23
- [263-5902-00L] Computer Vision (Lecturer: Marc Pollefeys & Siyu Tang & Fisher Yu) Fall 22
- [252-0579-00L] 3D Vision (Lecturer: Marc Pollefeys & Daniel Barath) Spring 22
- [263-5904-00L] Deep Learning for Computer Vision: Seminal Work Spring 22
- [252-0579-00L] 3D Vision (Lecturer: Marc Pollefeys & Viktor Larsson) Spring 20
- [263-5904-00L] Deep Learning for Computer Vision: Seminal Work Spring 20

Teaching Assistant at University of Tübingen.....

- [ML-4103] Deep Learning (Lecturer: Andreas Geiger) Winter 20/21