

Songyou Peng | Curriculum Vitae

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Education

- ETH Zurich** **Zurich, Switzerland**
Doctor of Sciences, Max Planck ETH Center for Learning Systems PhD Fellowship 09/2019–11/2023
Supervisor: Prof. Marc Pollefeys & Prof. Andreas Geiger
- 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** **Xi'an, China**
B.Eng in Automation, focus: artificial intelligence 08/2011–07/2015
Cumulative GPA: 83.6/100, Major GPA: 87.4/100

Experience

- ETH Zurich** **Zurich, Switzerland**
Senior Researcher/Postdoc 12/2023–present
- Google Research** **Mountain View, USA**
Research Intern, mentor: Prof. Thomas Funkhouser 07/2022–11/2022
○ OpenScene: 3D scene understanding with open vocabularies. Accepted to CVPR 2023.
- Meta Reality Labs Research** **Pittsburgh, USA (remote)**
Research Intern, mentor: Dr. Michael Zollhöfer 09/2021–12/2021
○ Real-time neural rendering for 360-degree indoor scenes.
- Agency for Science, Technology and Research (A*STAR)** **Singapore**
Research Engineer, Institute for Infocomm Research 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** **Singapore**
Research Engineer, supervisor: Dr. Stefan Winkler, IEEE Fellow 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)** **Munich, Germany**
Master Thesis, supervisor: Prof. Daniel Cremers & Dr. Yvain Queau 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** **Grenoble, France**
Research Intern, supervisor: Prof. Peter Sturm 2016 & 2017 summer
○ ICCV oral paper: designed a calibration guidance system for obtaining optimal calibration images.

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

Selected Publications (Full List at Google Scholar)

- Weining Ren*, Zihan Zhu*, Boyang Sun, Jiaqi Chen, Marc Pollefeys, **Songyou Peng**, “NeRF *On-the-go*: Exploiting Uncertainty for Distractor-free NeRFs in the Wild”, **CVPR**, 2024.
- Lei Li, **Songyou Peng**, Zehao Yu, Shaohui Liu, Rémi Pautrat, Xiaochuan Yin, Marc Pollefeys, “3D Neural Edge Reconstruction”, **CVPR**, 2024.
- **Songyou Peng***, Zihan Zhu*, Viktor Larsson, Zhaopeng Cui, Martin R. Oswald, Andreas Geiger, Marc Pollefeys, “NICER-SLAM: Neural Implicit Scene Encoding for RGB SLAM”, **3DV**, 2024. (**Oral, Best Paper Honorable Mention**)
- **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)

Awards & Fellowships

- Best Paper Honorable Mention Award at 3DV 2024
- Max Planck ETH Center for Learning Systems PhD Fellowship 2019 – 2023
- Best Presentation Award at ICVSS 2023
- 1st place in partial object recovery in SHARP Challenge at CVPR 2022
- Outstanding Reviewer of CVPR (Top 2%) 2022
- Highlighted Reviewer of ICLR (Top 8%) 2022
- Most Influential ECCV Papers: ConvONet #13 (link) 2020
- 1st place in vision-only task and 2nd in overall in OMG-Emotion Recognition Challenge 2018

- o EU Erasmus+ mobility grant, awarded by European Union Commission 2016 & 2017
- o Excellent bachelor thesis (top 5% of all graduates), XJTU 2015
- o 1st in Search and Rescue Robot Challenge, California State University, USA 2010
- o 2nd in Trinity College Fire Fighting Home Robot Contest, Connecticut, USA 2010
- o 2nd in RoboCup Junior China Qualification Trial, Suzhou, China 2007

Invited Talks

- o 2D Magic in a 3D World. *Imperial College London* 2024
- o 2D Magic in a 3D World. *The University of Hong Kong* 2024
- o Dive into Neural Implicit-Explicit 3D Representations. *Invited lecture at SGP graduate school* 2023
- o OpenScene: 3D Scene Understanding with Open Vocabularies. *Apple* 2023
- o OpenScene: 3D Scene Understanding with Open Vocabularies. *Stability.ai* 2023
- o OpenScene: 3D Scene Understanding with Open Vocabularies. *Peking University* 2023
- o Learning to Reconstruct and Understand the 3D World. *Microsoft Mix Reality & AI Lab* 2023
- o Learning Neural Scene Representations for 3D Reconstruction and Understanding. *Shanghai AI Lab* 2023
- o How do NeRF and CLIP advance 3D Scene Reconstruction and Understanding? *Bosch* 2023
- o Large-Scale 3D Scene Reconstruction with NeRF. *Stanford University* 2022
- o Towards Practical Applications of NeRF. *Adobe Research* 2022
- o Neural Scene Representations for 3D Reconstruction. *University of Basel* 2022
- o Shape As Points: A Differentiable Poisson Solver. *Talking Papers Podcast* 2022
- o Towards Practical Applications of NeRF. *GAMES Webinar Series* 2021

Teaching

Teaching Assistant at ETH Zurich

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

Teaching Assistant at University of Tübingen

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

Supervised Master Students at ETH Zurich

- o [Semester project] Jan Ackermann (Next: Master thesis at Stanford University) 2024
- o [Master thesis] Lei Li (Next: Computer Vision Researcher at UTOPILOT) 2023
- o [Master thesis] Weining Ren (Next: PhD Student at the University of Hong Kong) 2023
- o [Master thesis] Lei Li (Next: Researcher at UTOPILOT) 2023
- o [Master thesis] Mirlan Karimov (Next: PhD Student at Mercedes-Benz AG) 2023
- o [Semester project] Gonca Yilmaz (Next: Master thesis with CVG, ETH Zurich) 2023

- [Semester project] Shengqu Cai (Next: PhD Student at Stanford University) 2023
- [Semester project] Zihan Zhu (Next: PhD Student at ETH Zurich) 2022
- [Master thesis] Pfister Severin (Next: Consultant at McKinsey) 2021
- [Semester project] Weirong Chen (Next: PhD Student at TU Munich) 2021

Service

- **Publicity Chair:** 3DV 2025
- **Area Chair:** 3DV 2024 (done during PhD)
- **Workshop Organizer:**
 - OpenSUN3D: 1st Open-Vocabulary 3D Scene Understanding, ICCV 2023
 - OpenSUN3D: 2nd Open-Vocabulary 3D Scene Understanding, CVPR 2024
- **Conference Reviewer:** CVPR, ICCV, ECCV, SIGGRAPH, SIGGRAPH Asia, NeurIPS, ICLR, RSS
- **Journal Reviewer:** TPAMI, IJCV, CVIU