

Tong Wei

Finishing PhD in Computer Vision
Curriculum Vitae

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PROFILE

Computer vision PhD candidate working on learned matchability prediction for robust 3D reconstruction. My research focuses on selecting reliable image pairs in complex or noisy image collections for pose graph construction, SfM, and feed-forward reconstruction methods, with related work on visual overlap prediction, global-aware edge scoring, feature matching, and differentiable RANSAC.

PhD thesis: Learned Robust Matchability Prediction in Image Collections.

EDUCATION

- **Czech Technical University in Prague** Sep. 2022 -- present
PhD candidate in Computer Science, Supervisors: Jiri Matas and Daniel Barath. | Prague, Czech Republic
- **Eotvos Lorand University** Sep. 2020 -- Jun. 2022
MSc in Computer Science, AI Specialization, Grade: 4.36/5 | Budapest, Hungary
- **Liaoning Technical University** Aug. 2015 -- Jun. 2019
BSc in Communication Engineering, Grade: 3.19/4.5 | Liaoning, China

PUBLICATIONS

1. **T. Wei**, G. Tolias, J. Matas, and D. Barath. "Global-Aware Edge Prioritization for Pose Graph Initialization." *CVPR 2026*. **Oral presentation; award candidate; top 0.4% of submissions.**
2. **T. Wei**, P. Lindenberger, J. Matas, and D. Barath. "Breaking the Frame: Visual Place Recognition by Overlap Prediction." *WACV 2025*.
3. **T. Wei**, Y. Patel, A. Shekhovtsov, J. Matas, and D. Barath. "Generalized Differentiable RANSAC." *ICCV 2023*.
4. **T. Wei**, J. Matas, and D. Barath. "Adaptive Reordering Sampler with Neurally Guided MAGSAC." *ICCV 2023*.
5. Z. Tao, **T. Wei**, and J. Li. "Wavelet Multi-level Attention Capsule Network for Texture Classification." *IEEE Signal Processing Letters*, 28:1215--1219, 2021.
6. S. Lin, K. Chi, **T. Wei**, and Z. Tao. "Underwater Image Sharpening Based on Structure Restoration and Texture Enhancement." *Applied Optics*, 60(15):4443--4454, 2021.

RESEARCH EXPERIENCE

- **Doctoral Researcher**, Visual Recognition Group, CTU in Prague, from July. 2022. Developed learning-based methods for matchability prediction, reliable image-pair selection, pose graph construction, and robust estimation for 3D reconstruction.
- **Academic Guest**, Computer Vision and Geometry Group, ETH Zurich, Oct. 2024--Dec. 2024. Worked on minimum-spanning-tree-based image pair retrieval and pose graph construction for robust and efficient SfM.
- SMART study, CTU in Prague, Mar. 2026--present. Developing ML methods for oocyte quality and fertilization success prediction from polarized-light microscopy images.
- Sparse-to-fine billboard image verification, Jan. 2025--Dec. 2025, CTU in Prague. Applied sparse matching, homography estimation, and dense patch verification for robust image verification.
- Attended International Computer Vision Summer School, Sicily, Italy, 2023.
- Attended Vision and Sports Summer School, Prague, Czech Republic, 2022.

AWARDS

- **CVPR Best Paper Award candidate** with paper Wei, T., Tolias, G., Matas, J. and Barath, D., 2026. Global-Aware Edge Prioritization for Pose Graph Initialization. CVPR 2026 (pp. 28642-28651).
- **Stipendium Hungaricum Master's Scholarship**, 2020--2022.
- **Excellent Master's Student**, Liaoning Technical University, 2021.

- **First Prize, Band A, National English Competition** for College Students, 2020.
- **Best Bachelor Thesis Award**, "3D Object Detection Network for Point Cloud Classification", 2019.

TALKS, SUPERVISION, TEACHING AND ACADEMIC SERVICE

- Teaching assistant of Medical Image Processing course (BAM33ZMO), CTU in Prague, semester 2026-2027.
- Master thesis reviewer/opponent at CTU in Prague, 2025.
- Supervisor of a semester project in the Mixed Reality course, ETH Zurich, 2024. Project: "Where am I?" Interactive indoor localization and navigation on Magic Leap 2 hardware.
- Invited talk, Computer Vision Winter Workshop, Slovenia, 2024. Topic: learning-based RANSAC scoring functions.
- Invited talk, Computer Vision Winter Workshop, Austria, 2023. Topic: differentiable RANSAC components and applications.
- Reviewer for CVPR, ECCV, NeurIPS, ICLR, AAAI, and 3DV.

PROGRAMMING SKILLS Python; C/C++; PyTorch; Keras; Kornia; OpenCV.

LANGUAGES Chinese native; English fluent.