Wei Pan | Ph.D

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Male | Dec 1990

Education

Singapore University of Technology and Design (SUTD) **Singapore**
Ph.D. in Engineering Product Development *2013–2018*
Supervisor: Prof. Lujie Chen
Full Presidential Graduate Scholarship

Zhejiang University **Hangzhou, China**
B.Eng. in Optical Engineering (Honors Program) *2009–2013*
GPA 3.60/4.0

Research Interests

Machine Vision, Computational Imaging, Computational Geometry, Computer Aided Design, Algorithm and Optimization

Professional Experience

OPT Machine Vision Tech Co., Ltd. **Tokyo, Japan**
R&D Director, PI *2021.01–Present*

- Leading a 20+ algorithm team, and responsible for core algorithms and 3D imaging systems in industrial machine vision
- Focus on high-precision fast 3D imaging (structured light, line laser, phase deflectometry, photometric stereo), depth map/point cloud/mesh processing, industrial defect detection, 3D surface measurement, registration, robotic grasping, etc.
- 70+ invention patents filed, 10+ granted, many technologies mass-produced in Li-battery, 3C, automotive, medical, logistics industries, etc.

Guangdong OPT Machine Vision Tech Co., Ltd. **Dongguan, China**
Senior Algorithm Engineer *2019.06–Present*

- Core module leader for structured-light 3D reconstruction, SciVision depth/point-cloud processing SDK, real-time rendering system
- **Principal Investigator / Key Member of Major Projects:**
  - Dongguan Major Science & Technology Project (Key Fields R&D Program - Key Technology Breakthrough):
    Intelligent Inspection Technology and Application for High-end Manufacturing Processes (Principal Co-PI, 2023–2025)
  - Guangdong Provincial Key Fields R&D Program:
    Micron-level Real-time Vision Inspection Technology Research and System Development (Key Member, 2021–2024)
  - Dongguan Key R&D Project (2020):
    Robotic 3D Vision Intelligent Grasping System R&D and Application Demonstration (Key Member, 2020–2022)

The University of Tokyo **Tokyo, Japan**
Collaborative Researcher, Supervisor: Prof. Takeo Igarashi *2021.01–2021.12*

- Deep learning-based sketch auto-generation and weaving pattern fast retrieval
- 3D modeling and textile garment automatic segmentation

South China University of Technology **Guangzhou, China**
Collaborative Researcher, Supervisor: Prof. Xianmin Zhang *2019.10–2022.01*
High-precision 3D measurement and data processing algorithms in industrial inspection

Shenzhen University **Shenzhen, China**
Postdoctoral Researcher, Supervisor: Prof. Guoping Qiu *2018.06–2019.05*
3D mesh filtering, automated 3D scanning system, robotic grasping, half-window Laplacian-based mesh denoising algorithm

Singapore University of Technology and Design
Ph.D. Candidate, Supervisor: Prof. Lujie Chen *2013.09–2018.03*
Ultra-large-scale rapid prototyping, voxelized model transformation algorithms, Lego automated assembly sequence planning

Early Research & Internship Experience

A*STAR Institute of Materials Research and Engineering **Singapore**
Research Intern, Supervisor: Dr. Liu Yanjun *2014.05–2014.09*
Plasmon-induced transparency nanostructures: spectral testing and FDTD simulation (COMSOL); published in Nanotechnology 26(2):025201 (2015)

Zhejiang University **Hangzhou**
B.Eng. Thesis, Supervisor: Prof. Kuang Cuifang *2013.01–2013.07*
STORM super-resolution microscopy system: MATLAB convolution simulation + full C++ control and image processing software

University of Alberta **Edmonton, Canada**
Exchange Student, Supervisor: Prof. Zubin Jacob *2012.09–2012.12*
Super-resolution microscopy (STORM & STEM) theory review and performance comparison

Kuang-Chi Institute **Shenzhen**
Summer Research Intern, Supervisor: Dr. Guo Jie *2012.07–2012.08*
Metamaterial antenna design and simulation (COMSOL + CST); awarded Outstanding Intern

Services

- Technical Committee: icicv2025, icigp2025/2026, acmmm2024, mcaccv2022
- Conference Reviewer: aaai2026, eccv2025, cvpr2026, icicv2025, icigp2025, acmmm2024, mcaccv2022
- Journal Reviewer: EAAI, AUTCON, EJRS, BSPC, CVIU, KBS, TVCG, IJCV, CVMJ, Scientific Reports
- Journal Editorial Board: The Computational Vision and Imaging

Awards

- First Prize, Guangdong Machinery Industry Science and Technology Award, Guangdong Province, 2023
- First Prize, Guangdong Mechanical Engineering Society Science and Technology Award, Guangdong Province, 2023
- Second Prize, Henan Province Science and Technology Progress Award, Henan Province, 2023
- Singapore Presidential Graduate Scholarship, Singapore, 2013–2018
- Zhejiang University Outstanding Graduate, Hangzhou, China, 2013

- Kuang-Chi Talent Scholarship, Shenzhen, China, 2012
- First Prize, 5th Zhejiang University Optics Design Competition (sole first prize in laser listening group), Hangzhou, China, 2012
- First-Class Academic Excellence Scholarship, Zhejiang University, Hangzhou, China, 2009
- Outstanding Student Honor, Zhejiang University, Hangzhou, China, 2009–2013 (annual)
- Scholarship for Excellent Students in Sports and Arts, Zhejiang University, Hangzhou, China, 2009–2013 (annual)

Skills

Languages: Mandarin (Native), English (Fluent), Japanese (Elementary)

Programming: C++, Python, MATLAB

Interests: Badminton, Soccer, Swimming

Publications

1. **Pan Wei**, Yuhao Wu, Wenming Tang, et al. An improved graph attention network for semantic segmentation of industrial point clouds in automotive battery sealing nail defect detection. *Engineering Applications of Artificial Intelligence*, 2026, 163(1): 112793.
2. **Pan Wei**, Jiang Bin-feng, Tang Wen-ming et al. Gap measurement method based on projection lines and convex analysis of 3D point cloud. *Measurement Science and Technology*, 2024, 35(10): 105024.
3. Lu Lei, Bu Chenhao, Su Zhilong, ..., **Pan Wei**. Generative deep-learning-embedded asynchronous structured light for three-dimensional imaging. *Advanced Photonics*, 2024, 6(4): 046004.
4. Zhang Qinghui, Liu Feng, Lu Lei, ..., **Pan Wei**. Reconstruction of transparent objects using phase shifting profilometry based on diffusion models. *Optics Express*, 2024, 32(8): 13342-13356.
5. Fung Sheldon, **Pan Wei**, Lu Xuequan et al. DeSC: Learning Deep Semantic Descriptor for NeRF Registration. *IEEE TVCG*, 2025 (in press).
6. Fung Sheldon, Lu Xuequan, ..., **Pan Wei**, Liu Xiao, Li Hongdong. SemReg: Semantics constrained point cloud registration. *ECCV 2024*.
7. Wang Weijia, **Pan Wei**, Dai Chaofan et al. Segmentation-driven feature-preserving mesh denoising. *The Visual Computer*, 2024, 40: 6201-6217.
8. Wang Weijia, **Pan Wei**, Liu Xiao et al. Random screening-based feature aggregation for point cloud denoising. *Computers & Graphics*, 2023, 116: 64-72.
9. Liu Jiaxiang, ..., **Pan Wei*** et al. Deep learning-enabled 3D multimodal fusion of cone-beam CT and intraoral mesh scans for clinically applicable tooth-bone reconstruction. *Patterns* (Cell Press), 2023, 4(9).
10. **Pan Wei**, Gong Yuanhao, Tang Wenming et al. HLO: Half-kernel Laplacian operator for surface smoothing. *Computer-Aided Design*, 2020, 121: 102807.

Invention Patents (70+ total)

Granted Patents (selected)

- **CN119006550B** Neural Radiance Field Registration Method, System and Product (2025)
- **CN119919533B** Downsampled Single-frequency Phase Unwrapping Method (2025)
- **CN117275032B** CAD Drawing Geometric Contour Extraction Method and System (2025)
- **CN114324168B** Surface Defect Detection Method and System (2024)

- **CN113178013B** Triangle Mesh Filtering Method, Device, Equipment and Medium (2023)
- **CN112802077B** High-precision Point Cloud Normal Estimation Method (2023)
- **CN113269860B & WO2022257594A1(PCT)** High-precision 3D Data Real-time Progressive Rendering Method and System (2021)
- **CN110120069B** Laplacian-based Triangle Mesh Filtering Method (2019)
- **CN109702738B** 3D Object Recognition-based Robotic Hand-eye Calibration Method (2019)

Recent Filed (2023–2025, selected)

- **CN120807339A** Periodic Texture Smoothing with Adaptive Threshold and Position Constraints (2025)
- **CN120777999A** Automated Debugging and Calibration System and Method (2025)
- **CN120689197A** Bit-field Multi-channel Fusion Reversible Grayscale Method (2025)
- **CN120598883A** Complex Surface Defect Detection via Phase Deflectometry + Photometric Stereo (2025)
- **CN120388003A** Multi-cost Fusion Speckle Structured Light Stereo Matching (2025)
- **CN120339358A** Surface Reconstruction via Phase Deflectometry + Photometric Stereo (2025)
- **CN119919533A** Downsampled Single-frequency Phase Unwrapping (2025)
- **CN118982691A** Differential Chain Code-based Contour Matching (2024)
- **CN118967759A** RGB-D Point Cloud Registration via Semantic Information (2024)
- **CN118823038A** Image Region Contour Representation Method (2024)
- **CN118397020A** Fast Image Region Segmentation and Contour Extraction (2024)
- **CN118154810A** Discrete Orthogonal Polynomial-based 3D Data Filtering (2024)
- **CN117793547A** Depth Map Jitter Correction via Differential Fitting (2024)
- **CN117606363A** Non-contact Gap Measurement via Convex Hull and Centroid Projection (2024)
- **CN117172266A** Dot-matrix QR Code Localization and Decoding (2023)
- **CN116958415A** Focus 3D Reconstruction Based on Structured Light (2023)
- **CN116188561A** Irregular Object Area and Volume Measurement (2023)

(Full list available on patent platform)