

Yuyuan Han

Computational imaging & robust image-free sensing

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PhD student in single-pixel imaging and image-free sensing: designs optical measurements and trains networks that operate directly on the measurements, without image reconstruction.

Education & Research Appointments

Xi'an Jiaotong University · PhD student 2022–present

Electronic Science and Technology · Master's-to-PhD track · Advisor: Huaibin Zheng

Politecnico di Milano · Visiting PhD student Oct 2026–present

Department of Physics · Supervisor: Antonio Pifferi

Northwest University · B.Eng. 2018–2022

Electronic Information Science and Technology

Selected Research

The Lift Spectrum · Robust image-free sensing Preprint

[arXiv](#) · 2026 · [Paper](#) · [Code](#)

- Showed that, without reconstruction, the 1D-to-2D lift is the design problem; mapped the lift spectrum.
- Proposed STSF + TPLS: +3.2–9.9 mIoU over the prior image-free method (SPIFS); near-constant accuracy down to 0.78% sampling; up to +21.7 mIoU over clean-trained reconstruct-then-segment at 20 dB noise.

Sparse Hadamard single-pixel imaging

[Optics Express](#) · 2025 · [Paper](#) · [Code](#)

- Introduced tunable sparsity into orthogonal Hadamard patterns: noise-robust imaging through scattering, low-order matrices that save memory, no training or post-processing.

LDGI · Optical phased-array imaging

[Optics Communications](#) · 2025 · [Paper](#) · [Code](#)

- Showed that line patterns from one-dimensional optical phased arrays break the noise symmetry of ghost-imaging denoising; proposed LDGI (orders-of-magnitude gains), validated optically.

Current Research

Acquisition-aware single-pixel sensing with optical-bench tests (manuscript in preparation); question answering on single-pixel measurements (exploratory). Planned at Politecnico di Milano: time-domain diffuse optical tomography.

Open Source & Tools

Open source · [remote-gpu-trainer](#), an agent skill for Claude Code and Codex that runs, verifies and delivers GPU experiments (60+ GitHub stars)

Tools & lab · PyTorch, MATLAB, COMSOL; DMD/SLM illumination, single-pixel detection, optical alignment and system integration

Device modeling · Electro-optic phased-array geometry modeling and optimization for beam steering

Award & Service

2024 · Second Prize, National Post-Graduate Mathematical Contest in Modeling · [Code](#)

Reviewer · IEEE TIP, IEEE TCI, Optics Express, Optics Letters (13 verified reviews, 2025–2026)