

WEIHENG TANG

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SUMMARY

Second-year ECE Ph.D. student in computational imaging and machine learning, spanning optical hardware, forward modeling, and generative reconstruction. **Four peer-reviewed papers** (one co-first-authored) plus one under review: a 54-camera system resolving $50\times$ more pixels per frame than existing facial-expression databases, and diffusion methods beating state-of-the-art baselines by 5–20% on PSNR, SSIM, and LPIPS. Seeking a **Summer 2027** research internship in imaging, vision, or ML.

EDUCATION

Purdue University — Ph.D., Electrical & Computer Engineering · GPA 4.00 / 4.00 Aug 2025 – May 2030 (expected)
Ross Fellowship, Purdue Graduate School — university-wide award for incoming Ph.D. students Aug 2025
Peking University — B.S. in Physics, second degree in Economics · GPA 3.80 / 4.00 Sep 2020 – Jul 2025
Gold Medal, 36th Chinese Physics Olympiad — national rank 55 Oct 2019

TECHNICAL SKILLS

Languages & Tools	Python, PyTorch, NumPy/SciPy, MATLAB, Git, Linux, LaTeX
Machine Learning	Diffusion / score-based generative models, Diffusion Posterior Sampling, plug-and-play priors, EM, Monte Carlo sampling
Computational Imaging	Structured illumination microscopy (2D/3D), physics-based forward modeling, deconvolution, super-resolution, multi-camera calibration

RESEARCH EXPERIENCE

Diffusion Models for Computational Imaging and Image Restoration Aug 2025 – Present
Purdue University · Advisor: Prof. Stanley H. Chan

- Benchmarked a metalens aberration-correction diffusion pipeline against **six competing deblurring and pansharpening methods**, producing the comparison that anchored the paper's central claim; co-drafted the revision (**ICASSP 2026**).
- Third author on **WTA-SR** (under review, **NeurIPS 2026**), which synchronizes optimization objectives across all steps of a multi-step diffusion super-resolution model to win fidelity and perceptual realism at once.

High-Throughput Facial Micro-Expression Imaging with a Multi-Focus Camera Array Nov 2023 – Sep 2024
Duke University · Advisor: Prof. Roarke Horstmeyer

- Delivered a 54-camera multi-focus system that records dynamic facial micro-expressions at 12 fps across an $\sim 85\text{ cm}^2$ field of view at $\sim 26\text{ }\mu\text{m}$ resolution — over **$50\times$ more resolved pixels per frame** than any existing database.
- Solved the curved-face focus problem by distributing each camera's focal plane against a reference facial model, stitching all 54 streams into one all-in-focus video with $\sim 43\text{ mm}$ depth of field.

Generative Solvers for Imaging Inverse Problems: Microscopy and Restoration Mar 2024 – Mar 2025
Peking University · Advisor: Prof. He Sun

- Outperformed leading super-resolution methods (Sparse-SIM, ZS-DeconvNet, UniFMIR) by **more than 5% in both PSNR and SSIM**, while additionally producing per-pixel uncertainty estimates that none of those baselines provide.
- Adapted Diffusion Posterior Sampling to microscopy by pairing score-based image priors with a physics-informed likelihood, and built 2D and 3D structured-illumination forward models to enforce data consistency at every sampling step.
- Beat every baseline (Ambient Diffusion, SURE-Score) by **more than 7% PSNR, 20% LPIPS, and 13% lower FID** on denoising and deblurring — while training on noisy data only, with no clean ground truth.
- Diagnosed the inaccuracy of the standard DPS E-step and replaced it with a plug-and-play Monte Carlo sampler, upgrading that framework from a heuristic to one with provable convergence.

SELECTED PUBLICATIONS

- Co-first author** — Recording dynamic facial micro-expressions with a multi-focus camera array. *Biomedical Optics Express*.
- 2nd author** — Learning diffusion model from noisy measurement using principled expectation-maximization method. *ICASSP 2025*.
- 4th author** — Diffusion algorithm for metalens optical aberration correction. *ICASSP 2026*.
- 4th author** — Microscopic image restoration and uncertainty quantification using physics-informed generative models. *Proc. SPIE 13333*, 2025.
- 3rd author** — Aligning diffusion trajectories for real-world image super-resolution. Under review, *NeurIPS 2026*.

AWARDS & LEADERSHIP

- Qin Wanshun & Jin Yunhui Fellowship** for Fundamental Disciplines, Top 5% (2020). **CNPC Scholarship**, Top 10% (2022). **Merit Student**, Top 5%, and **Excellent Academic Performance**, Top 10% (2021).
- Led the physics-olympiad teaching group at Shenzhen Experimental High School (2022); physics outreach volunteer (2021).