NINGDONG WANG

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EDUCATION

Cornell University — Expected May 2027
Ph.D. in Physics — Ithaca, NY
Focus: Scientific machine learning, generative models, numerical optimization
Awards: DOE Office of Science SCGSR Program (2023); DOE Tigner Traineeship (2025)

University of Illinois at Urbana–Champaign — May 2020
B.S. in Electrical Engineering & Engineering Physics (dual degree) — Urbana, IL

INDUSTRY EXPERIENCE

Shizuku AI — May – August 2026
Creative Engineer (Summer Intern) — San Francisco, CA & Tokyo, Japan

- **Real-Time Multimodal Agents:** Developed an agent harness for autonomous livestreaming, integrating audio, vision, audience comments, tool calls, and speech output; achieved best-case end-to-end response latency below 1 second.
- **TTS Data Synthesis:** Built a high-throughput text-to-speech (TTS) data pipeline that generated 25,000 hours of training audio; achieved a real-time factor of 0.03 through batching, caching, and runtime optimization.
- **Low-Latency TTS:** Optimized a production TTS inference runtime and implemented bidirectional streaming, reducing time to first audio from 600 ms to 180 ms.

RESEARCH EXPERIENCE

Cornell University — May 2021 – Present
Research Assistant — Ithaca, NY

- **Latent-Space Dynamics:** Independently designed and trained a VAE + causal-transformer model in PyTorch, generating synthetic data and running training on HPC. Accurately reconstructed 6D beam distributions under a wide range of conditions without retraining.
- **Physics-Informed Surrogates:** Implemented a 3D U-Net with a Poisson-equation loss to predict electric fields from particle-density grids. Enabled differentiable collective effect simulation for particle beams.
- **Scientific Agents:** Built agentic AI infrastructure for accelerator simulation and control-system tools and an evaluation framework for multi-step agent correctness and reliability.
- **GPU-Accelerated Simulation:** Developed SpaceCharge.jl, a Julia GPU-accelerated field solver using custom kernels; achieved ~1000× speedup over the legacy Fortran solver at production problem sizes.

Brookhaven National Laboratory — June 2023 – Present
Research Assistant — Upton, NY & Remote

- **Simulation and Optimization:** Built parallel Monte Carlo simulations and applied multi-objective genetic and Bayesian optimization to particle-beam design, reducing beam energy spread by 85%.

PUBLICATIONS

Learning beam dynamics in the latent space of beam distributions. *IPAC*, 2026.

Status of Osprey: a framework for agentic AI in control systems. *IPAC*, 2026 (co-author).

Multi-objective optimization of Strong Hadron Cooler Energy Recovery Linac injector. *NAPAC*, 2025.

Optimization of cooling distribution of the EIC SHC cooler ERL. *IPAC*, 2024.

EIC cooler injector space charge benchmark. *IPAC*, 2023.

Cathode Space Charge in Bmad. *IPAC*, 2022.

TECHNICAL SKILLS

Programming: Python, Julia, C/C++, CUDA, Fortran
Machine Learning: PyTorch, transformers, VAEs, U-Net, physics-informed neural networks
Agentic AI: agent harness, MCP, tool calling, agent evaluation, RAG
Scientific Computing: MPI/OpenMP, Slurm, HPC, NVIDIA Nsight, Docker, Linux, Git