Jiajie Fan

Jiajie.jf@gmail.com | github.com/jiajie96 | linkedin.com/in/jiajiefan

Technical Skills: diffusion models (2D/3D), AGI, LLMs, RAG, latent modeling, PyTo
TensorFlow, VR/AR, Unity/Unreal, Docker, Git, Python, C#, TypeScript, benchmarkin
multimodality, real-world datasets, technical writing, AWS.

Education

Leiden University, Advanced Computer Science (PhD, 10.2022 – **any time in 2025**)

Darmstadt University of Technology, Mechanical Engineering (MSc, 10.2018 – 10.2022, Darmstadt, Germany)

Experience

Generative AI for Engineering Designs (PhD, BMW Munich, 10.2022 – any time in 2025)

- Developed a hybrid model of VAE and GANs, for Synthesis of 2D design cross-sections (car part). [6]
- Developed advanced 2D/3D diffusion models for synthesizing industrial images, point clouds meshes, signed distance fields, and CAD (B-Rep) data, enabling automated generation of feasible engineering designs.
- Optimized noise scheduling strategies for diffusion models (**EDM**, Karras et al.), improving efficiency and plausibility of generated bicycle designs (increasing plausible result rate by **10%**). Implemented latent manipulation techniques, including inpainting (**RePaint**) and dragging (**DragGan**). [4]
- Designed a plausibility **evaluation metric** Fréchet Denoised Distance (published on **ECCV 2024**), outperforming FID in assessing design plausibility for generative models. [3]
- Developed NeuroNURBS, a multi-modal multi-task transformer that enables deep learning on **parametric geometries**, reducing CAD training data storage requirements by **79.9%.** [2]
- Created a **learning-free** pipeline to **encode** high-dimensional data using solely wavelet transforms and SVD, training diffusion model on resulted latent space achieves comparable performance to state-of-the-art. [1]
- Served as BMW **Doctoral Speaker** in 2024; organized an educational trip to China for 30 doctoral students.

BMW Internship (04.2021 – 11.2021, Munich)

- AR/VR (Unity and Unreal with C#) software development for HoloLens and HTC vive.
- Create a complete digital twin of a real-world factory in Unity.

Bausicht, Full-stack Website Development (05.2021– 10.2022, Münster)

- Web-based software development with TypeScript and Vue.js.
- Working in a software developing team with Git and Jira.

Darmstadt University of Technology, Working Student (04.2020 – 02.2021, Darmstadt , Germany)

- Estimate water consumption in Austin for coming years and RNN.
- Remaining useful life estimation for drones using LSTM and TensorFlow.

Publication

1. A Mesh Is Worth 512 Numbers: Spectral-domain Diffusion Modeling for High-dimension Shape Generation, under review
2. NeuroNURBS: Learning Efficient Surface Representations for 3D Solids, under review
3. Enhancing Plausibility Evaluation for Generated Designs with Denoising Autoencoder, **ECCV 2024**
4. Co-author: GeoDiffusion: A Training-Free Framework for Accurate 3D Geometric Conditioning in Image Generation, **ICCV2025**
5. On the Noise Scheduling for Generating Plausible Designs with Diffusion Models, under review
6. Adversarial Latent Autoencoder with Self-Attention for Structural Image Synthesis, **IEEE CAI 2024**