Daniel Mika

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EDUCATION

University of Pennsylvania — Philadelphia, USA
MSE in Robotics (GRASP Lab) — *2024-2026*
Dual Degree Jerome Fisher Program in Management & Technology (acceptance rate 1.5%): — *2022-2026*
BSE in Artificial Intelligence, BS in Economics (Wharton)

Engineering School — Krakow, Poland
Co-Op SWE Program, Computer Science Engineer Diploma — *2016-2020*

RESEARCH INTERESTS

Computer Vision with a focus on 3D/4D reconstruction and generation from sparse input, generative video models, camera control in video generation, and 4D scene generation.

RESEARCH EXPERIENCE

Penn Computer Graphics Lab — Philadelphia, USA
University of Pennsylvania, Advisor Prof. Lingjie Liu — *Jan 2024 - present*

Generative 4D NVS from sparse input using latent 4D Gaussians and video diffusion (ongoing):

- Developing a multiview ViT encoder to predict 4D Gaussian latents for conditioning open-source video diffusion models (Mochi/OpenSora) decoder, enabling temporally and spatially consistent novel view synthesis with camera and time control.
- The architecture enforces 4D consistency in latent space, eliminating the need for 4D reconstruction at inference. Builds upon insights from ReconFusion, latentSplat, CAT3D, CAT4D, and similar works.

Active Training Data Selection for Generative Video Models (ongoing):

- Developing self-supervised methods for dynamic selection of informative video content during training, replacing uniform temporal subsampling and full sequence generation with content-aware approaches.

AttentionNGP: Implicit Attention-Based Regularization for Multiresolution Hash Encodings

- Introduced a local attention mechanism into hash grid embeddings to enable unbiased, data-dependent gradient distribution to align with local texture and density complexity. Inspired by inductive biases proposed in Mip-NeRF 360, Zip-NeRF, and NeuralAngelo.
- Designed a mechanism using 3 iNGP hash grids (Q, K, V) to allow the optimization to modulate gradient flow by aligning attention scores.
- Achieved results comparable to Zip-NeRF (within 0.2 PSNR) with its original testing setup. The attention-based regularization approached the same quality without the need for strong inductive biases.

APPLIED RESEARCH AND ENGINERING INDUSTRY EXPERIENCE

Applied AI Research Consultant — Remote, *2017 - 2022*
Selected projects

- For a window glass manufacturer, I led the development of a Computer Vision quality control system. Achieved FNR <1% and reduced required manual inspections by 90%.
- For a UK startup, I redesigned product recommendation algorithm incorporating temporal event data and content embeddings into the GNN model. Our model outperformed the previous solution by 26%.

CTO & Head of Research (Computer Vision-based Recommendation Systems) — Krakow, Poland
GetDressed | Fashion-Tech AI Startup — *Jun 2018 - May 2022*

- Led a 10-member research, engineering, and product team to develop an AI fashion stylist system using multimodal contrastive learning, achieving state-of-the-art performance in 2020.
- Combined with an adapted GraphSAGE model, created an event-based recommendation system delivering personalized fashion advice for e-commerce customers with <120ms inference time.
- Scaled the system to over 300,000 user sessions and 22M requests daily at peak for the largest client.

Data Scientist, part-time — Krakow, Poland
IsoSoft | Software Development Company — *Feb 2015 - Sept 2016*

- Developed data collection, predictive analytics, and simple recommendation systems for web and mobile applications; collaborated with clients on three commercial projects.
- First ML and data science hire at the company at 15 years old.

OTHER RELEVANT EXPERIENCE

Founder, CEO — Remote, *2022 - present*
Descope | Boutique software engineering for VC-backed startups
Providing software engineering services in a unique development-till-onboarding process to build V1 in days while setting up a founding engineering team for 8 clients with over $670000 total value.