Divyansh Shukla

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Summary

Aspiring embodied AI researcher focused on generative models and modern ML systems, with projects spanning flow-matching/diffusion, decoder-only transformers, vision-language model (VLM) experimentation, and robotics/mechatronics prototyping.

Projects

VLM Project
https://github.com/divyanshuklai/vlm-project
- Built an end-to-end VLM pipeline (data prep → training → eval) that simplified experiment iteration and reduced time-to-result.
- Implemented alignment + preference optimization methods including RLHF (reward modeling + optimization), DPO, and RLVR (GRPO-style RL fine-tuning).
- Enhanced evaluation rigor with benchmark-driven comparisons (competitive with similarly sized models) and standardized, reproducible runs on Modal.

FlappyBirDiT
https://github.com/divyanshuklai/FlappyBirDiT
- Built a video diffusion pipeline for near real-time inference, conditioned on player inputs to generate responsive gameplay frames.
- Enhanced model selection via ablations over model size, samplers, priors, training methods (SDE/ODE/diffusion-style), and guidance-injection strategies.
- Achieved playable frame quality and frame rate by benchmarking playability targets (throughput + visual fidelity) and iterating toward stable, interactive generation.

Zero-shot ICE RMA (Teacher–Student RL)
https://github.com/divyanshuklai/zero-shot-ice-rma
- Replicated the original RMA (teacher–student) approach and extended it into a reproducible training + evaluation workflow.
- Increased robustness and generalization via built-in domain randomization and evaluation across a multitude of environments for training and transfer testing.
- Enabled easier sim-to-sim transfer and laid groundwork for sim-to-real deployment tooling (repeatable configs, eval harness, and deployment-oriented utilities).

Custom2DRoPEDiT (DiT w/ 2D RoPE)
https://github.com/divyanshuklai/Custom2DRoPEDiT
- Implemented a custom Diffusion Transformer (DiT) variant with 2D (height, width) rotary positional embeddings (RoPE) for image tokens.
- Enhanced sample efficiency vs. a 2D sinusoidal positional-embedding baseline by reducing steps-to-quality (fewer training steps for comparable samples).
- Increased training throughput via faster convergence, reducing overall training time while improving final sample quality.
- Lowered FID and improved robustness on out-of-distribution aspect ratios and resolutions (non-square, higher-res) through stress-tested generation.

Skills

- Languages: Python, C++, CUDA, HTML
- Libraries: PyTorch (w/ Distributed), PyTorch Lightning, Hugging Face Transformers, TRL, vLLM, pandas, OpenCV
- RL/Sim: Gymnasium, MuJoCo
- ML / DL: diffusion models, flow matching, transformer architectures, reinforcement learning, vision-language model experimentation
- Tools/Workflow: Hydra, Jupyter notebooks, Modal (remote compute)

Certifications

- Applied Accelerated Artificial Intelligence (NPTEL25CS98)
- Deep Learning with Computer Vision (NPTEL25CS93)
- Deep Learning Specialization (Coursera)