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Meta Reality Labs - Codec Avatars, DataGen Mar 2024 - Current

- Used DiT- and U-Net-based diffusion models to generate HMC (head-mounted capture) synthetic datasets, powering downstream avatar models such as face expression encoding, eye tracking, and face bio-authentication for '26+ ARVR devices.
- Increased output diversity by introducing a per-user-ID, learnable conditioning token to model latent visual qualities e.g. face/eye/nose, and adjusted the control token at inference-time to boost images' appearance variety.

Cruise - Perception, Detection Core Sept 2022 - Dec 2023

- Boosted multi-task LiDAR perception model training efficiency 5×, driving an estimated $3.8M annual savings by optimizing GT target generation, GPU memory/backprop flow, hyperparameters (batch size, prefetching), and experimenting with 2nd-order optimizers and LR schedules.
- Independently led migration of two critical-path LiDAR perception models from legacy repos' training loops to a structured, reproducible PyTorch Lightning framework, enabling infrastructure team support, traceable telemetry, GPU profiling, testing, and ongoing deployment.
- Diagnosed bottlenecks in a multi-platform modeling library developed by 20+ engineers, and proposed & implemented a flexible, config-driven architecture definition syntax to streamline parallel workstreams on models' backbones / heads / novel sensor fusion architectures.

Meta Reality Labs - Holograms Dec 2020 - July 2022

- Designed and prototyped a real-time, neural re-rendering model for AR glasses, refining imperfectly rendered 2D inputs due to occlusion and sensor sparsity (e.g. jointly solving inpainting & denoising) for remote calling features.
- Led cross-org collaboration (8 engineers) to unify two ML model training stacks—Meta's custom silicon research codebases and Detectron2Go—which cut research-to-deployment lead time by 4 months, and enabled shared datasets, pretrained model backbones, and other utilities.

Meta Reality Labs - AR Authentic Presence Sep 2019 - Dec 2020

- Delivered 3 CV ML models (hand detection/keypoints/gestures, person segmentation, foot keypoints) powering high-traffic (100k daily impressions) AR effects and virtual backgrounds on Messenger, Facebook, and Instagram.
- Optimized PyTorch models' inference time from 20-25s native to 20-40ms on int8-quantized CPU hardware by post-processing trained models with layer fusion, Torchscript export, and Lite interpreter binary compilation.
- Owned creation of a 400k+ sample real-world dataset by defining collection protocols, coordinating with vendors, and cleaning noisy data for robust model training.

RESEARCH

Generative Head-Mounted Camera Captures for Photorealistic Avatars (GenHMC) — https://arxiv.org/abs/2507.05620

- Novel method to improve codec avatar encoder's SoTA accuracy + data efficiency, by leveraging diffusion models to generate HMC camera images with controllable lighting, glasses/Rx, subject appearance, and more. GenHMC is trained on small volumes of real data with sparse categorical- and spatial labels (kpts / seg), and learns to generalize & interpolate in the data domain to enable arbitrary choices of new synthetic data.

EDUCATION

Stanford University — B.S. Computer Science, June 2018
Stanford University — M.S. Computer Science, June 2019
Teaching Assistant: Convolutional Neural Networks for Visual Recognition (CS 231N, Spring 2019)

Tools, Languages, Frameworks: PyTorch, PT Lightning, Detectron2 / D2Go, NumPy, Git, Mercurial, Tensorflow / Keras, Tensorboard, Jupyter notebooks, Matplotlib, Pandas, Sklearn, Python, C++, Java