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work experience

Oct 2017–Oct 2021 **Machine Learning Engineer** at HyperConnect — Seoul

- Real-time Voice Context Classification
- Virtuous Cycle of AI
  - Designed a self-improving fine-tuning and deployment cycle for image classification server task.
  - Improved recall of underrepresented classes by more than 50 % while keeping high precision.
  - Cycle is orchestrated by three separate KubeFlow pipelines.

Python, KubeFlow, BigQuery, PyTorch, Shell Script

- Large Scale Distributed Training
  - Lead for multi-node distributed training project utilizing large amounts of data (> 25 M images).
  - Prepared codebase for efficient scaling up to 64 GPUs on AWS infrastructure using p3.16xlarge instances.
  - Accelerated training up to 8x compared to single node training.
  - Implemented AWS multi-node launcher to simplify starting and orchestrating of new experiments across multiple instances.
  - Provided a new multi-class image classification model with a significant improvement over the previous model.

Python, PyTorch, Shell Script

- Face Synthesis
  - Real-time face generation and facial expression transfer on mobile device.
  - Few-shot face image generation using style attention, feature warping and landmark transformer.

Python, PyTorch, Tensorflow, CoreML, Swift

- Low-bit Neural Networks
  - Researched and implemented various binarization schemes for single and multi-task classification.
  - Implemented conversion tool from PyTorch graph to custom model format.
  - Developed and optimized inference engine for mobile devices.

Python, PyTorch, C++, SIMD, Android Java

- 8-bit Quantized Neural Networks
  - 8-bit quantized model for Image Classification and Semantic Image Segmentation in Azar.
  - Optimization of Tensorflow Lite for inference of Semantic Image Segmentation model.
  - Multi-label Image Classification in Picai - Smart AI Camera.
  - 2nd place at Low Power Image Recognition Challenge at 2018.

Python, C++, Tensorflow, Tensorflow Lite, SIMD, Android Java, Swift

Dec 2016–Sep 2017 **Assistant Research Engineer** at Hanyang Information & Communications Co., Ltd. — Seoul

- Researched Object Detection networks and their application on NVIDIA Tegra (TK1, TX1 and TX2).
- Integrated Computer Vision modules (Lane Detection, Vehicle Detection, Tracking, Object Detection and Object Distance Estimation).
- Represented company at CeBIT 2017 exhibition.
- Lead of annotation project for Object Detection (plan for data collection, modification of online annotation tool, work assignment).

C++, Python, Caffe, Tensorflow, OpenCV

Jul 2015–Sep 2016 **Machine Learning Engineer** at Company 100, Inc. — Seoul

- Researched and implemented algorithms for Object Detection and Semantic Image Segmentation.
- Improved fashion recommendation engine for incorrectly segmented parts of clothes.
- Created prototype for detection and segmentation of clothes using Convolutional Neural Networks.
- Created hybrid mobile application and server for communication between mobile application and recommendation engine.

Python, Caffe, C/C++, Matlab

research

Oct 2021 Temporal Knowledge Distillation for On-device Audio Classification, arxiv, ICASSP 2022

Nov 2019 MarioNETte: Few-shot Face Reenactment Preserving Identity of Unseen Targets, arxiv, AAAI 2020

Mar 2019 Temporal Convolution for Real-time Keyword Spotting on Mobile Devices, arxiv, INTERSPEECH 2019

Oct 2018 Towards Real-Time Automatic Portrait Matting on Mobile Devices, arxiv

education

Sep 2012–Jun 2015 Master's degree from Czech Technical University in Prague, Knowledge Engineering

Sep 2009–Jun 2012 Bachelor's degree from University of Technology in Brno, Information Technology