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Chiao Yen-Hao

Software Engineer

Companies & Education

2021 - Now	**SenseTime,** AI Solution Manager
2019 - 2021	**Perfect Corp**, Senior Software Engineer
2012 - 2018	**Garmin**, Advanced Software Engineer
2010 - 2012	M.S. Computer Science, Computer Vision Lab National Tsing Hua University, Taiwan
2006 - 2010	B.S. Computer Science National Tsing Hua University, Taiwan

Skills

Computer Vision

Object detection, video stabilization, structure from motion, semantic segmentation

Deep Learning

Tensorflow, Keras, CNNs

Programming Languages

C++, python, C#, javascript, OpenCV

Project Experiences

Virtual try-on product management

(1 manager, 1 engineer, 3 months)

- Product management
  - Overlook market and potential competitors. Provide knowledge for tech niche of products and new business model
  - Keep track of product roadmap, business status and risks
- Handle and filter questions/requirements from sales teams
- End-to-end web-based demo tool development
  - Create try-on material by 3D scanning and mesh editing
  - Build SaaS platform for try-on material management
  - Build real-time virtual try-on rendering web page (auto data sync with SaaS platform)

(AI) Hand virtual try-on

(7 engineers, 4 months)

- Training data generation (synthetic)
  - Generate training data from 3D hand model for ring/bracelet/nail virtual try-on
  - Render training images with Blender
  - Compute ground truth labels from hand mesh and joint coordinates
- Hand tracking
  - AI model for live 3D hand joints detection
- Finger pose estimation
  - AI model for live finger joints 3D pose estimation (translation, rotation, scale)

(AI) Skin care feature detection

(1 engineer, 1 year)

- Acne detection (B2B), texture detection (B2B), dehydration detection (B2C)
- Full-stack from scratch to product
  - Data collection, labelling, augmentation, balancing
  - Model design
  - Post-processing, porting to PC, mobile and web platforms

(AI) Feature integration and porting

(1 engineer, 6 months)

- Integration of 10 skin care features from different people and repositories
  - Coding style unification, code size reduction (>50%)
- Porting AI detectors to web platform with tensorflow.js
  - Web assembly for fast pre-processing and post-processing
  - TFJS for fast inference
- Set up and maintain servers for real time skin care detection

Traffic sign recognition (1 engineer, 2 assistants, 4 months)

- Image feature extraction for traffic signs with traditional CV algorithms
  - HSV color space, edge detection, connected components, DtBs, HOG
- SVM for classification (over 20 classes), with both precision and recall > 90%
- Replace manual operation of traffic sign labeling with automatic identification

3D reconstruction and ortho-rectification from aerial images (3 engineers, 10 months)

- Reconstruct 3D scene from multiple 2D images by
  - SfM (Structure from Motion) to estimate camera poses, and construct ground feature point cloud
  - Bundle adjustment, with Ceres library for non-linear least square optimization
- Collaborating with GIS engineers, perform image stitching by orthographic projection, with re-projection error < 50cm

Garmin street view survey car (1 engineer, 3 drivers, 6 months)

- A large-scale update of survey car production software
  - Re-factory of production software into shooting, storage, map, user interface modules
  - Resolve overflowed memory problem due to replacement of high-resolution cameras
  - Dynamic adjustment of camera parameters to improve image quality
- Manage issue report system and related databases
- Online resolving issues reported by survey car drivers

React web app

- Self-driven project
- A YouTube music player with user-based playlist and real-time shared playlist
- Built with React, Redux, Material UI for appearance, and Firebase for data storage

Publications

1. Rolling shutter correction for video with large depth of field. ICIP'13
2. Blind image deblurring with modified richardson-lucy deconvolution for ringing artifact suppression. PSIVT'11