Jiedong Hao

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👥 Professional Experience

video fingerprinting/deduplication – vivo   Jan. 2021 – present

machine learning engineer

- Designed and implemented a video deduplication system that processes over **1m** videos daily. Improved the system recall from 0.7 to **0.93**, and precision from 0.9 to **0.92**.
- Designed and implemented the system evaluation protocol, and the offline evaluation framework.
- Reduced the extracted video frames per video from over 60 to 15, a **75%** decrease in storage space.
- Built the frame feature vector model via deep metric learning. Implemented the video similarity matching algorithm using longest common subsequence (LCS).
- Developed and deployed various video-deduplication related services, and video frame feature extraction service via **Flask**, **uWSGI** and **Docker**.

PPT reconstruction from a single image – vivo   Oct. 2019 – Dec. 2020

machine learning engineer

- Designed and implemented a system to turn PPT images to an editable PowerPoint document. Lead the whole project, from data collection, quality goal, model development to bug fixes.
- Built a **maskRCNN** model to detect document elements.
- Designed and implemented the document element and OCR results **post-processing** pipeline, which can generate accurate reconstruction info for text, images, tables, equations etc.
- Implemented the PPT document generation and preview feature using python-pptx, libreoffice.
- Improved the reconstruction acceptance rate (by human inspector) from 60% to 90%+.

Smart WiFi recognition – vivo   Jun. 2019 – Dec. 2020

Junior machine learning engineer

- Lead and manage the whole project, from data collection, quality goal, algorithm development to bug fixes.
- Designed a flexible and accurate WiFi info parsing module based on OCR result.
- Developed and deployed the system as a web service using Flask, Docker and uWSGI.
- Improved the recognition accuracy for WiFi account from 77.8% to 90%, and accuracy for password from 74.6% to 85.9%.

Business card OCR and general OCR – vivo   Oct. 2018 – Jun. 2019

Junior machine learning engineer

- Developed a tool to generate vertical text images for training text recognition model.
- Built and trained CRNN model to recognize vertical text images, and reduced CER for business card OCR from 0.14 to 0.06, and CER for general OCR from 0.36 to 0.2.
- Built and trained document orientation classification model with weighted cross entropy, accuracy: 0.99
- Built a model to classify the orientation of text lines, accuracy: 0.97

🎓 Education

Institute of Automation, the Chinese Academy of Sciences, Beijing, China   2014 – 2018

Master in Pattern Recognition and Intelligent Systems

Central South University, Changsha, China   2010 – 2014

B.S. in Automation

⚙ Professional Skills

- Programming

    - Language: Python, C++, Lua, shell script
    - packages: NumPy, Pandas, Matplotlib, PyTorch, Scikit-Learn, Flask, uWSGI, multiprocessing
    - tools: Docker, Bash, Zsh, Git, Make, Docker, Vim/Neovim, PyCharm, VS Code

- Pattern Recognition and Machine Learning

    - OCR: text recognition, text image generation; document image reconstruction: object detection, document layout analysis and post-processing; video fingerprinting; image classification; image retrieval; deep metric learning

- Language: Excellent reading and writing skills in English, CET-4: 650, CET-6: 613

Selected Open-Source Projects & Contributions

- better-escape.vim: A Nvim plugin to help the users escape insert mode without lagging.
- nvim-config: A modern Nvim config distribution with extensive documentations.

🗐 Publication

- Hao, Jiedong, et al. "DeepFirearm: Learning discriminative feature representation for fine-grained firearm retrieval." ICPR 2018 (**Best Scientific Paper Award**)
- Jiedong Hao, et al. "EEM: An End-to-end Evaluation Metric for Scene Text Detection and Recognition." ICDAR 2021

🛈 Miscellaneous

- GitHub: https://github.com/jdhao
- Stack Overflow: reputation **17k**, **top 0.09%** among all users, impacted **10.3m** users, **170+** answers
- Tech Blog: https://jdhao.github.io/ (total PV: **2.9 million**, monthly PV: **30k**)