Yifan Jiang

Ph.D. in Artificial Intelligence

"Dedicating myself to COVID-19 diagnosis and detection using modern AI techniques."

Contact

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Skills

AI & ML related programming 8+ yrs.

Python 8+ yrs.

PyTorch and Keras frameworks 5+ yrs.

Large-scale image data analysis 5+ yrs.

Verilog & FPGA Development 2+ yrs.

C & C++ 2+ yrs.

R 1+ yrs.

Biography

- Yifan Jiang is a research professor at Korea University and spent over eight years as a machine learning & computer vision expert.
- His research centres on image synthesis and action recognition techniques that show considerable potential in COVID-19 diagnosis.
- His contributions allow COVID-19 diagnostic approaches to alleviate their dependency on high-quality data while maintaining advanced performance.
- He published several high-impacted academic papers in top journals and conferences on medical imaging analysis and computer vision.

Education

Signal Processing and Multimedia (Ph.D.) Mar/2019 - Feb/2022

School of Electrical Engineering (Prof. Hanseok Ko)
Korea University, South Korea

- Research interests: GANs based image synthesis and deep learning based COVID-19 diagnosis.
- COVID-19 CT image synthesis:
  - A conditional GANs based image synthesizer generates realistic COVID-19 CT images that can use in downstream diagnostic tasks.
  - This research was published in IEEE JBHI (a top journal of Health Information Management) as a featured article, with 39 citations as yet.
  - Project site (hyperlink); Paper (hyperlink).
- Few-shot COVID-19 CT diagnosis:
  - A domain adaptation based approach can utilize synthetic CT data to achieve better few-shot COVID-19 diagnostic performance.
  - This research was published in ICASSP 2021 (a top conference in image and acoustic signal processing).
  - Project site (hyperlink); Paper (hyperlink).
- Human action synthesis for COVID-19 symptoms detection:
  - A controllable GANs inversion method can generate diverse sequential actions corresponding to the most common COVID-19 symptoms.
  - A real-time action recognition approach is introduced to handle COVID-19 symptoms detection using synthetic action sequences.
  - Project site (hyperlink); Paper (hyperlink).
- Side scan sonar image synthesis:
  - A conditional GANs based image synthesizer that generates high-quality side scan sonar images from manually crafted segmentation layouts.
  - This research was published in IEEE Geoscience and Remote Sensing Letters (a high-impacted journal of geoscience).
  - Project site (hyperlink); Paper (hyperlink).

Research Interests

- Medical Imaging Analysis
- Human Action Recognition
- Visual Object Tracking
- Generative Adversarial Networks (GANs)
- Transfer Learning
- Deep Reinforcement Learning

Languages

Chinese & Mandarin L1

English C1

Korean C1

Signal Processing and Multimedia (M.S.) **Mar/2017 - Feb/2019**
School of Electrical Engineering (Prof. Hanseok Ko)
Korea University, South Korea

- Research interests: deep reinforcement learning (DRL) based object tracking.
- DRL based visual object tracker:
  - A DRL based single object tracking approach inspired by the human perception mechanism.
  - This research was published in IET computer vision (a high-impacted journal of computer vision).
  - Project site (hyperlink); Paper (hyperlink).
- DRL based multi-person tracking bounding box regression:
  - A DRL based bounding box regression method can improve multi-person tracking performance significantly.
  - This research was published in ICASSP 2018 (a top conference in image and acoustic signal processing).
  - Project site (hyperlink); Paper (hyperlink).

Electronic Information Engineering (B.S.) **Sep/2011 - June/2015**
College of Information and Communication Engineering
Harbin Engineering University, China

- Research interests: Computer vision algorithms' acceleration using SoC FPGA.
- I received basic training in machine learning and computer vision, which laid a strong foundation for my later research and career.

Work Experience

Research Professor **Mar/2022 - Present**
School of Electrical Engineering
Korea University

- Research interests: AI avatar programming and robotic perception, including 3D pose estimation and human action recognition.
- Current project: Perception & response related research for AI Avatar.

Awards

- **BK21 (Brain Korea 21) plus Scholarship**, issued by *Brain Korea 21* , Mar 2019.
- **Natural Sciences and Engineering Scholarship**, issued by *Korea University* , Mar 2019.
- **BK21 (Brain Korea 21) plus Scholarship**, issued by *Brain Korea 21* , Mar 2017.
- **Natural Sciences and Engineering Scholarship**, issued by *Korea University*, Mar 2017.

Publications: International Journals

- Yifan Jiang, Han Chen, Murray Loew, and Hanseok Ko. "COVID-19 CT image synthesis with a conditional generative adversarial network." IEEE Journal of Biomedical and Health Informatics 25.2 (2020): 441-452.
- Yifan Jiang, Bonhwa Ku, Wanjin Kim, and Hanseok Ko. "Side-Scan Sonar Image Synthesis Based on Generative Adversarial Network for Images in Multiple Frequencies." IEEE Geoscience and Remote Sensing Letters 18.9 (2020): 1505-1509.
- Yifan Jiang, David K. Han, and Hanseok Ko. "Relay dueling network for visual tracking with broad field-of-view." IET Computer Vision 13.7 (2019): 615-622.
- Han Chen, Yifan Jiang, Murray Loew, and Hanseok Ko. "Unsupervised domain adaptation based COVID-19 CT infection segmentation network." Applied Intelligence (2021): 1-14.
- Han Chen, Yifan Jiang, Murray Loew and Hanseok Ko. "A Teacher-Student Framework with Fourier Augmentation for COVID-19 Infection Segmentation in CT Images." arXiv preprint arXiv:2110.06411 (2021). (Preprint)

Publications: International Conferences

- Yifan Jiang, Han Chen, David K. Han, and Hanseok Ko. "Few-shot learning for CT scan based COVID-19 diagnosis." ICASSP 2021-2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). IEEE, 2021.
- Yifan Jiang, Hyunhak Shin, and Hanseok Ko. "Precise regression for bounding box correction for improved tracking based on deep reinforcement learning." 2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). IEEE, 2018.
- Yifan Jiang, Hyunhak Shin, Jaeyong Ju and Hanseok Ko. "Online pedestrian tracking with multi-stage re-identification." 2017 14th IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS). IEEE, 2017.
- Han Chen, Yifan Jiang, and Hanseok Ko. "Action Recognition with Domain Invariant Features of Skeleton Image." 2021 17th IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS). IEEE, 2021.
- Luis Patino, Jonathan Boyle, James Ferryman, Mertcan Cokbas, Janusz Konrad, Prakash Ishwar, Giulia Slavic, Lucio Marcenaro, Yifan Jiang, Youngsaeng Jin, Hanseok Ko, Guangliang Zhao, Guy Ben-yosef, Jianwei Qiu. " PETS2021: Through-foliage detection and tracking challenge and evaluation." 2021 18th IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS). IEEE, 2021.

Yifan Jiang, 22nd April 2022