

Songyao Jiang

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EDUCATION

- Northeastern University** Boston, MA
Ph.D. in Computer Engineering 06/2016 – 04/2022 (expected)
 - Advisor: Prof. [Yun \(Raymond\) Fu](#)
 - Concentration: Computer Vision and Pattern Recognition, Machine Learning.
- University of Michigan** Ann Arbor, MI
Master of Science in Electrical and Computer Engineering 09/2013 – 06/2015
 - Coursework: Linear Algebra, Machine Learning, Image Processing, Database Management, Embedded System Programming, *etc.*
- Hong Kong Polytechnic University** Hong Kong
Bachelor of Engineering in Electrical Engineering, 09/2009 – 06/2013
 - Coursework: Programming, Computer Architecture, Operating Systems, Analog and Digital Circuits, *etc.*
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RESEARCH INTERESTS

Computer Vision: Human Face and Gesture, Video Classifications, Human Detection and Pose Estimation, Generative Models, Adversarial Training, Skeleton-base Action Recognition, Sign Language Recognition.

RESEARCH EXPERIENCE

- Northeastern University** Boston, MA
Research Assistant in SMILE Lab 06/2016 – present
 - Advisor: Prof. Yun (Raymond) Fu
 - Research topics: human detection, pose estimation, action recognition, sign language recognition, generative models, adversarial training.
- Giaran, Inc. (acquired by Shiseido Americas)** Boston, MA
Research Engineer and Founding Member 01/2017 – 09/2017
 - Developed key algorithms in the core products, including a real-time AI color calibration system, a virtual makeup addon, removal and recommendation system and a face detection and alignment using OpenCV/Caffe in C++ and JavaScript.
- Northeastern University** Boston, MA
Research Assistant in Power Electronics Research Group 09/2015 – 06/2016
 - Advisor: Prof. Bradley Lehman
 - Research topic: Machine learning on photovoltaic power prediction.
- Teld New Energy** Qingdao, China
Research Engineer in Electric Vehicle Research Team 05/2015 – 08/2015
 - Research topic: Grouped smart mass charging system for electric vehicles (EV).
 - Developed a machine learning based smart charging algorithm for massively grouped EV charging system, which mitigated the charging load on power system, optimized the use of renewable energy resources in micro-grids, and improved the EV battery life.
- Nagoya University** Nagoya, Japan
Research Assistant in Suzuoki Lab 05/2014 – 08/2014
 - Advisor: Prof. Takeyoshi Kato
 - Research topic: mathematical modelling of renewable energy.
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TEACHING EXPERIENCE

Northeastern University

Boston, MA

Teaching Assistant for Course EECE-5642: Data Visualization

Spring 2018

- Introduced relevant topics and concepts in visualization, including computer graphics, visual data representation, physical and human vision models, numerical representation of knowledge and concept, animation techniques, pattern analysis, and computational methods.
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PUBLICATIONS

- B. Sun, Y. Zhang, **S. Jiang**, and Y. Fu, "Hybrid Pixel-Unshuffled Network for Lightweight Image Super-Resolution," *Under Review*, 2021.
 - **S. Jiang**, B. Sun, L. Wang, Y. Bai, K. Li, and Y. Fu, "Sign Language Recognition via Skeleton-aware Multi-modal Ensemble," *Under Review*, 2021.
 - **S. Jiang**, B. Sun, L. Wang, Y. Bai, K. Li, and Y. Fu, "Skeleton Aware Multi-modal Sign Language Recognition," in *Proceedings of IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2021.
 - **S. Jiang**, Z. Tao, and Y. Fu, "Geometrically Editable Face Image Translation with Adversarial Networks," *IEEE Transactions on Image Processing (TIP)*, vol. 30, pp. 2771-2783, 2021.
 - **S. Jiang**, H. Liu, Y. Wu, and Y. Fu, "Spatially Constrained GAN for Face and Fashion Synthesis," in *Proceedings of 16th IEEE International Conference on Automatic Face & Gesture Recognition (FG)*, 2021.
 - Y. Yin, J. P. Robinson, **S. Jiang**, and Y. Fu, "SuperFront: From Low-resolution to High-resolution Frontal Face Synthesis," in *Proceedings of ACM Multimedia (ACMMM)*, 2021.
 - Y. Yin, **S. Jiang**, J. P. Robinson, and Y. Fu, "Dual-attention GAN for Large-pose Face Frontalization," in *Proceedings of 15th IEEE International Conference on Automatic Face & Gesture Recognition (FG)*, 2020.
 - S. Sarkar, W. Kang, **S. Jiang**, K. Li, S. Ray, E. Luther, ... and T. Konry, "Machine learning-aided quantification of antibody-based cancer immunotherapy by natural killer cells in microfluidic droplets," *Lab on a Chip*, 20(13), pp. 2317-2327, 2020.
 - Z. Hong, T. Sun, **S. Jiang**, K. Li, Y. Fu, H. Xu, J. Zhang, Y. Liu, Q. Ye, and H. Cang, "Harnessing Deep Learning to Overcome Photo-toxicity for Live-cell Imaging," *Under Review*, 2020.
 - **S. Jiang**, Z. Tao, and Y. Fu, "Segmentation Guided Image-to-Image Translation with Adversarial Networks," in *Proceedings of 14th IEEE International Conference on Automatic Face & Gesture Recognition (FG)*, 2019.
 - T. Alashkar, **S. Jiang**, and Y. Fu, "Rule-Based Facial Makeup Recommendation System," In *Proceedings of 12th IEEE International Conference on Automatic Face & Gesture Recognition (FG)*, 2017.
 - T. Alashkar, **S. Jiang**, S. Wang, and Y. Fu, "Examples-Rules Guided Deep Neural Network for Makeup Recommendation," in *Proceedings of AAAI Conference on Artificial Intelligence (AAAI)*, 2017.
 - **S. Jiang** and T. Kato, "Dynamic Modelling of Combined Cycle Power Plant for Load Frequency Control with Large Penetration of Renewable Energy," in *7th JUACEP Workshop*. 2014.
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OTHER RESEARCH PROJECTS

Northeastern University

Boston, MA

Video-based Multi-person 2D Pose Estimation with Tracking

02/2020 – 07/2020

- Improved the accuracy of pose estimation and tracking by utilizing temporal information of the human body movement between adjacent video frames using a temporal-aware deep CNN based network, which refined the pose estimation results in video and real-time scenarios and handled difficult cases like occlusions.

Northeastern University

Boston, MA

Face Recognition and Verification in Low-light Condition Using Transfer Learning

05/2019 – 11/2019

- In low-light condition, we utilized mid-range and long-range infra-red (IR) wavelengths to obtain the portrait images of the target persons for face recognition and verification.

- Developed a semi-supervised metric learning method and an unsupervised adversarial method to transfer the knowledge from visible spectrum to IR spectrum. Such approach achieved much higher accuracy.

Northeastern University

Boston, MA

Facial Attributes Classification, Makeup Recommendation and Addon Systems

02/2016 – 04/2016

- Collected a facial attribute and makeup dataset (e.g., skin color, face and eye shapes). Developed a facial attribute classification system using pretrained deep features and multi-class SVM.
- The predicted classes of facial attributes were then used to recommend makeup styles for users using a learned knowledge-based system learned from YouTube makeup videos. A makeup add-on system is developed to virtually visualize the recommended makeup.
- Awarded NSF I-Corps Grant "[Facial Image Analysis System](#)".

Northeastern University

Boston, MA

Machine-Learning Based Snow Effect and Photovoltaic Power Output Prediction

12/2015 – 03/2016

- Predicted the snow effects on photovoltaic (PV) power output during winter when PV panels experienced snowfalls. A machine learning approach was trained with historical weather and power data of solar farms to predict the snow effect on the PV power output.

PATENTS

- Y. Fu, **S. Jiang**, "Segmentation Guided Image Generation with Adversarial Networks," *US Patent 10,825,219*.
- Y. Fu, **S. Jiang**, B. Sun, "Light-Weight Pose Estimation Network with Multi-Scale Heatmap Fusion," *US Patent App. No.: 62/976,099. WIPO Patent App. No.: WO/2021/163103*
- Y. Fu, **S. Jiang**, "Video 2D Multi-person Pose Estimation using Multi-frame Refinement and Optimization," *WIPO Patent App. No.: WO 2020/232069*.
- Y. Fu, S. Wang, S. Lee, **S. Jiang**, B. Sun, H. Mao, K. H. E. Cheung, "Systems and Methods for Virtual Facial Makeup Removal and Simulation, Fast Facial Detection and Landmark Tracking, Reduction in ...," *US Patent App. No: 16/584,310*

HONORS & AWARDS

NVIDIA CCS Best Student Paper Award	2021
Champion of the CVPR 2021 Challenge on Signer-independent Isolated Sign Language Recognition	2021
• Team leader and championships winner in both RGB and RGB-D tracks.	
4th Rank in CVPR 2021 Challenge on Agriculture-Vision (Supervised Track)	2021
PhD Network Travel Grant, Northeastern University, USA	2019
GapFund360 Award, Northeastern University, USA	2018
JUACEP Research Award, Nagoya University, Japan	2014
JASSO Scholarship, Nagoya University, Japan	2014
Outstanding Scholarship, Hong Kong Polytechnic University	2010, 2011, 2012, 2013

ACADEMIC SERVICE

Conference Reviewer

- International Conference on Computer Vision (ICCV)
- International Joint Conferences on Artificial Intelligence (IJCAI)
- IEEE International Conference on Automatic Face & Gesture Recognition (FG)
- IEEE International Conference on Data Mining (ICDM)
- IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR)

Journal Reviewer

- IEEE Transactions on Image Processing (TIP)
 - Journal of Visual Communication and Image Representation (JVCI)
 - The Vision Computer (TVCJ)
 - IET Image Processing
 - Journal of Electronic Imaging (JEI)
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COMPUTER SKILLS

PyTorch, TensorFlow, OpenCV, Python, C/C++, Caffe, MATLAB, Java, JavaScript, Database Management