

# Jiali Duan

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## Research Interests

Multimodal representation learning, Recommendations, Adversarial Reinforcement Learning

## Education

### University of Southern California

PhD. Electrical Engineering  
Advisor: Prof. C.-C.-Jay Kuo  
Co-Advisor: Prof. Stefanos Nikolaidis

Los Angeles, USA  
Sep. 2017 – May. 2021

### University of Chinese Academy of Sciences

M.S. Computer Science  
Advisor: Prof. Stan Z. Li (Institute of Automation, Chinese Academy of Sciences)  
• 2017 Presidential Award of University of Chinese Academy of Sciences (Top %1 UCAS)  
• 2017 Excellent Graduate of Beijing (Top %1 Beijing graduates)  
• 2017 Outstanding Graduation Thesis in University of Chinese Academy of Sciences (Top %1 UCAS)

Beijing, China  
Sep. 2014 – Jul. 2017

## Publications

### Representation Learning

- **Jiali Duan**, Yen-Liang Lin, Son Tran, Larry Davis, C.-C. Jay Kuo. "SLADE: A Self-Training Framework for Distance Metric Learning". CVPR 2021
- **Jiali Duan**, C.-C. Jay Kuo. "Bridging Gap between Image Pixels and Semantics via Supervision: A Survey". APSIPA 2021
- **Jiali Duan**, Xiaoyuan Guo, Son Tran, C.-C. Jay Kuo. "Explainable Fashion Compatibility Recommendation via Unsupervised Latent Attribute Discovery". Arxiv Report 2021
- **Jiali Duan**, Xiaoyuan Guo, Son Tran, C.-C. Jay Kuo. "Fashion Compatibility Recommendation via Unsupervised Metric Graph Learning". SCMLS 2020
- **Jiali Duan**, Liqun Chen, Son Tran, Jinyu Yang, Yi Xu, Zeng Belinda, Trishul Chilimbi. "Multi-modal Alignment using Representation Codebook". CVPR under Review 2022
- Jinyu Yang, **Jiali Duan**, Son Tran, Liqun Chen, Yi Xu, Zeng Belinda, Trishul Chilimbi. "Multi-modal Representation Learning with Triple Contrastive Learning". CVPR under Review 2022

### Adversarial & Reinforcement Learning

- **Jiali Duan\***, Qian Wang\*, Lerrel Pinto, C.-C. Jay Kuo, Stefanos Nikolaidis. "Robot Learning via Human Adversarial Games". IROS 2019 (**Best Paper Finalist**)
- **Jiali Duan**, Qian Wang, Lerrel Pinto, C.-C. Jay Kuo and Stefanos Nikolaidis. "Robust Grasping via Human Adversary". SCR 2019 (Spotlight)
- **Jiali Duan**, Yilei Zeng, Yang Li, Emilio Ferrara, Lerrel Pinto, C.-C. Jay Kuo, Stefanos Nikolaidis. "Curriculum Reinforcement Learning Guided by Human". CoRR 2020
- **Jiali Duan**, Xiaoyuan Guo, C.-C. Jay Kuo. "PortraitGAN for Flexible Portrait Manipulation". APSIPA 2020
- Dongsheng Ding, Kaiqing Zhang, **Jiali Duan**, Tamer Basar, Mihailo R. Jovanovic. "Optimality and Convergence of Natural Policy Gradient Primal-Dual Method for Constrained MDPs". JMLR under review 2021

### Generic Computer Vision Tasks

- **Jiali Duan**, Shuai Zhou, Jun Wan, Xiaoyuan Guo, Stan Z. Li. A Unified Framework for Multi-Modal Isolated Gesture Recognition. ACM-TOMM, 2017

- **Jiali Duan**, Shengcai Liao, Shuai Zhou, Stan Z. Li. Face Classification, A Specialized Benchmark Study. CCBR (**Best Student Paper**), 2016
- **Jiali Duan**, Shengcai Liao, Xiaoyuan Guo, Stan Z. Li. Face Detection by Aggregating Visible Components. ACCVW (**Oral**), 2016
- **Jiali Duan**, Shuai Zhou, Jun Wan, Xiaoyuan Guo, Stan Z. Li. Multi-Modality Fusion based on Consensus-Voting and 3D Convolution for Isolated Gesture Recognition. Arxiv Report, 2016
- Yao Zhu, Saksham Suri, Pranav Kulkarni, Yueru Chen, **Jiali Duan**, C.-C. Jay Kuo. "An Interpretable Generative Model for Handwritten Digit Image Synthesis". ICIP 2019
- C.-C. Jay Kuo, Min Zhang, Siyang Li, **Jiali Duan**, Yueru Chen. Interpretable Convolutional Neural Networks via Feedforward Design. JVCi 2018 (**Best Paper Award**)

## Work Experience

### **Amazon M5 Core Modeling, Search Science & AI**

Palo Alto, USA

Role: Applied Scientist II

Oct. 2021 - Present

Manager: Son Tran (Principal Applied Scientist)

Responsibility: Work on M5 core modeling within Search Science & AI, which is a cross-org, cross-team endeavor to improve multimodal representation learning, query understanding and search quality across Amazon. I have 2 papers submitted to CVPR 2022 and 1 paper submitted to ICML 2022.

### **Amazon Visual Search & AR**

Palo Alto, USA

Role: Applied Scientist II

June. 2021 - Sep. 2021

Manager: Son Tran (Principal Applied Scientist)

Responsibility: Work on StyleSnap related projects at Visual Search&AR Team. My job focuses on improving detailed product page recommendation with self-supervised learning and vision-language pretraining.

### **Amazon A9**

Palo Alto, USA

Role: Applied Scientist Intern

May. 2020 - Jan. 2021

Mentor: YenLiang Lin (Applied Scientist)

Manager: Son Tran (Principal Applied Scientist)

Responsibility: Propose and implement one of the earliest semi-supervised deep metric learning framework that scales with unlabeled data. Our work significantly improves SOTA under both fractional and full labeled-data setting on three public benchmarks. The work accomplished during this internship was accepted to CVPR 2021.

### **Sensetime Beijing**

Beijing, China

Role: Applied Scientist Intern

Apr. 2017 - Jul. 2017

Mentor: Jianping Shi (Executive Research Director)

Responsibility: Focus on instance-segmentation and model deployment.

### **AuthenMetric**

Beijing, China

Role: Research Assistant

Sep. 2015 - Mar. 2016

Mentor: Professor Stan.Z.Li

Responsibility: Focus on face-analysis related products including face detection, segmentation, recognition and person re-identification.

## Media Coverage

- **Nov. 30, 2019, Express:** AI breakthrough: Showing Machine Learning Robots ‘Tough Love’ Helps Them Improve (<https://www.express.co.uk/news/science/1210543/ai-artificial-intelligence-machine-learning-robots-tough-love-helps-them-improve>).
- **Nov.06, 2019, Wired:** If You Want a Robot to Learn Better, Be a Jerk to It (<https://www.wired.com/story/if-you-want-a-robot-to-learn-better-be-a-jerk-to-it/>).
- **Nov.06, 2019, Daily Mail:** Tough Love! (<https://www.dailymail.co.uk/sciencetech/article-7656667/Tug-war-New-research-finds-robots-learn-effectively-humans-provide-physical-resistance.html>)
- **Nov.06, 2019, USC News:** Showing Robots ‘Tough Love’ Helps them Succeed, Finds New USC Study (<https://viterbischool.usc.edu/news/2019/11/showing-robots-tough-love-helps-them-succeed-finds-new-usc-study/>).

## Competition

- 2013 Honorable Mention in MCM/ICM Math Modeling Contest for American College Students
- 2012 First Prize in Mathematical Modeling Contest in Shanghai.
- 2012 Outstanding Prize in 21<sup>st</sup> Century Coca-Cola National English Speaking Contest Shanghai Region
- 2012 Second Prize in National Mathematical Modeling Contest in China.