Shuya ZHAO

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EDUCATION

Ph.D. in Computer Science (GPA: 4/4), **New York University**, NY	Sept. 2019 - May. 2024
M.S. in Computer Science (GPA: 4/4), **Rutgers University**, NJ	Sept. 2017 - May. 2019
B.Eng. in Information Engineering (GPA: 3.7/5), **NUAA**, China	Sept. 2013 - Jun. 2017
Visiting program in Electrical Engineering (GPA: 3.7/4), **UC Riverside**, CA	Aug. 2016 - Jun. 2017

SKILLS

Programming Languages: Python, Java, C/C++, JavaScipt, C#, MATLAB
Tools: TensorFlow, PyTorch, Scikit-learn, Keras, SQL/MySQL, Spark, D3, React, Redux, Latex, Unity

RESEARCH STATEMENT

Explainable AI: Motivated by the limitation and ambiguity in black-box Machine Learning models and methods, I focus on improving and interpreting video reasoning models and representation learning techniques through visual analytics and interactive system.

Computer Vision: Aimed to improve the generation of multi-genre art image from landscape photos and efficiently decrease the size of parameters in image generator models.

Recommender System: Explored the effect of Recommender System(RS) in E-commerce platforms and examined the existence of RS influence on user preference and content diversity of products.

EXPERIENCE

Research Assistant, New York University, NY   Sept. 2019 - Present
Work in the Visualization Imaging and Data Analysis Center(VIDA), advised by Prof. **Dr. Cláudio T. Silva**

- **Visual Analytics on Video Representation Learning**   June 2020 - Present
  - Combined contextual frame embeddings of multi-class baseball game videos with **data semantics** and **temporal labels** to improve video representation learning and augment human cognition using human-friendly **visual summarization** developed by Javascript(D3).
  - Built connections of embeddings across **multiple feature domains**(i.e. domains of images and small patches) to understand the performance of video representation on **synchronization** through interactive tools.
  - Interpreted video representation via **counterfactual explanation** and **model-agnostic methods**, and assessed the influences of different factors on feature space.

- **LegoTracker: An Intelligent Modular System for Sports Tracking**   Sept. 2020 - Present
  - Built a sensor system that contains fixed **panoramic cameras**, automatically motorized **zoomed cameras**, **stereo microphone** and **LiDAR sensor**. We use two kinds of cameras to locate players and capture details in the sports field, and use microphone and LiDAR to fix the occlusion in images.
  - Designed temporal tracking algorithms that could perform **object detection**, **pose estimation**, **sound classification**, and **LiDAR processing**. Each task is wrapped into a single module and computation results are shared across the modules which run simultaneously.
  - **Reconstruct the 3D skeleton** of players, compute **sound sources triangulation**, and **detect complex events** in player actions. The tracking results and analysis are displayed in web-based UI.

Graduate Student Researcher, Rutgers University, NJ   Sept. 2018 - May. 2019

- **Exploring Echo Chamber in E-commerce**, advised by Prof. Yongfeng Zhang   June 2019 - Oct. 2019
  - Detected the existence of **Echo Chamber Effect** in Real-world E-commerce Recommender System by performing experiments on collections of data consisting of **user clicks, purchases, and browse logs**.
  - To detect the Echo Chamber effect, analyzed **polarization in user preference** at a population level by applying **cluster validity indexes** in latent vector space of user interests, and examined **Filter Bubble**, the possible cause of former effect, by measuring the reduction in **content diversity** of recommended items to users.

- - Found that **Echo Chamber** appears in the users who take the recommendations while not in the other group via statistically significant difference(**p-value** is 2.16e−56) between measurements in two groups.
- **Image Style Transfer, Master Thesis**, advised by Prof. Ahmed Elgammal　　Sept. 2018 - Mar. 2019
  - Designed an image generator **conditioned style feature vectors** to transfer landscape photos into multiple art styles by employing a pre-trained style encoder and training the generator in **GAN**.
  - Encoded images' style into 100-length vector instead of labeling them to extract more characteristics from images via **encoder and classifier branches** in the **style encoder network**, avoiding the influence of image contents.
  - Added **cross-cycle consistency loss** in GAN training to strengthen **content learning** and **style transfer**, and increased **50%** efficiency on **bidirectional** style transfer by sharing parameters in generation of two directions, photo to art images and vice versa.

PUBLICATIONS

Yingqiang Ge*, **Shuya Zhao***, Honglu Zhou, Changhua Pei, Fei Sun, Wenwu Ou, and Yongfeng Zhang. **Understanding Echo Chambers in E-commerce Recommender Systems.** In Proceedings of **SIGIR 2020** Industry Track, July 25 − 30, 2020, Xi'An, China.

HONORS & AWARDS

Research Assistanship , NYU Tandon School of Engineering	Sept. 2020 - Present
Dean's Ph.D. Fellowship, NYU Tandon School of Engineering	Sept. 2019 - Aug. 2018