

# Shuya ZHAO

Email: [sz2257@nyu.edu](mailto:sz2257@nyu.edu) | Phone: +1 848 702 6754 | Website: [homepage](#) | Google Scholar: [pvpPbCUAAAAJ](#)

## EDUCATION

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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

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

## EXPERIENCE

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**Data Visualization Intern**, Epsilon, IL June 2021 - Aug. 2021  
Work on DiME project with the DSVA Team.

- **DiME: Digital Marketing Explorer** June 2021 - Aug. 2021
  - Design a simple D3 application that creates Human-friendly Visual Summarization of Clusters and deployed it to the DiME platform.
  - Visually analyzed the distributions of clusters of customers' IAB Browsing records using Hierarchical K-means clustering and cluster-map.

**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**

- **Stance: User-Driven Pose Metrics for Baseball Video Analysis** Jan. 2021 - March 2021
  - Outlined a feature extraction framework that extracts **view and player pose** information from unconstrained sports video using state-of-the-art computer vision techniques.
  - Introduce **Stance**, a visual analytics tool that allows analysts to explore and query large sports video collections based on **user-defined pose metrics** computed on top of our feature extraction framework.
  - Demonstrated **Stance's** analytical through use cases analyzing pitcher stride and batter swings, as well as how our extracted poses can be used to identify pitchers
- **ActionSync: Visual Exploration of Multi-class Sports Videos** Sept. 2020 - March 2021
  - Extracted **frame and video embeddings** via temporal consistency and Dynamic Time Warping, the learned representations contain spatio-temporal features that correspond to **actions** in sports videos.
  - Improved the-state-of-art unsupervised video representation learning methods by adding **triplet loss for action classification** to make it applicable to general multi-class datasets.
  - Designed a human-friendly visual analysis system, **ActionSync**, which interprets sports videos on both frame and video levels based on the video alignment task.
- **LegoTracker: An Intelligent Modular System for Sports Tracking** June 2020 - Present
  - Built a sensor system which contains fixed **panoramic cameras**, automatically motorized **zoomed camera**, **stereo microphone** and **LiDAR sensor**. With the help of cameras and sensor, we can locate players in sports field and capture details of their actions.
  - Designed temporal tracking algorithms which could perform **object detection, pose estimation, sound classification, and LiDAR processing**. Each task is wrapped into a single module using **Python**, and computation results are shared across the modules which run simultaneously.
  - Reconstruct 3D skeleton of players, compute sound sources, and detect complex events in videos. Then the tracking results and analysis are further displayed in web-based UI developed by **JavaScript**.

**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 with Python(**Scikit-learn**,**SciPy**) on collections of data consisting of **user clicks, purchases, and browse logs**.
- To detect Echo Chamber effect, we measured **polarization in user preference** of products on a population level by applying **cluster validity indexes** in latent vector 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 on style feature vectors with Python(**PyTorch**) to transfer landscape photos into art styles by training the generator with a pre-trained style encoder in **GAN**.
  - Encoded images' style into 100-dim vector instead of one-hot labels to extract more characteristics from images via building 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.

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## 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.

Guande Wu\*, **Shuya Zhao\***, Jianzhe Lin and Claudio Silva. **Basketball GAN: Sportingly Acceptable Trajectory Prediction**. IJCAI AI for Sports Analytics(AISA) 2021, August 17th, 2021(Virtual).

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## 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