Zhenjia Xu

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Education

Columbia University — **New York, NY, USA**
Ph.D. in Computer Science — *September 2019 - present*
Advisor: **Shuran Song**

Shanghai Jiao Tong University — **Shanghai, China**
B.Eng. in Computer Science, ACM class — *September 2015 - June 2019*
Total GPA: 3.94/4.3; Major GPA: 4.10/4.3; Ranking: 3rd/24

Publications

Unsupervised Discovery of Parts, Structure, and Dynamics
Zhenjia Xu*, *Zhijian Liu**, *Chen Sun, Kevin P. Murphy, William T. Freeman, Joshua B.Tenenbaum, and Jiajun Wu*
International Conference on Learning Representations (**ICLR**) 2019. **[Project Page] [PDF]**

DensePhysNet: Learning Dense Physical Object Representations via Multi-step Dynamic Interactions
Zhenjia Xu, *Jiajun Wu, Andy Zeng, Joshua B.Tenenbaum, and Shuran Song*
Robotics: Science and Systems (**RSS**) 2019. **[Project Page] [PDF]**

Research Experiences

Columbia University — **New York, NY, USA**
*Graduate Research Assistant, Advised by **Shuran Song*** — *September 2019 - present*

- **Infogain Manipulation**
  Propose a self-supervised system to learn a disentangled and interpretable representation for each object from visual observations and maximize the information gain via a sequence of robot interactions.

Massachusetts Institute of Technology — **Cambridge, MA, USA**
*Research Intern, Advised by **Joshua B.Tenenbaum*** — *July 2018 - January 2019*

- **Unsupervised Discovery of Parts, Structure, and Dynamics**
  Propose a novel formulation to, first, recognize the object parts via a layered image representation; second, predict hierarchy via a structural descriptor that composes low-level concepts into a hierarchical structure; and third, model the system dynamics by predicting the future from unlabeled videos.
- **DensePhysNet: Learning Dense Physical Object Representations via Multi-step Dynamic Interactions**
  Propose a system that actively executes a sequence of dynamic interactions (e.g., sliding and colliding), and uses a deep predictive model over its visual observations to learn dense, pixel-wise representations that reflect the physical properties of observed objects.

Honors and Awards

- **National Scholarship** (highest honor for undergraduates, **top 0.2%** in China). 2016, 2017
- **Rongchang Scholarship** (**top 1%** over 17,000 students in SJTU). 2016
- **Second Runner-up** (**3rd over 150** teams) in ACM-ICPC Regional Contest, Beijing Site. 2016
- **Second Runner-up** (**3rd over 120** teams) in Chinese Collegiate Programming Contest. 2016
- **Gold Medal** (**top 5% over 200** teams) in ACM-ICPC China Final. 2016
- **Gold Medal** (**top 7% over 150** teams) in ACM-ICPC Regional Contest, Beijing Site. 2015
- **Meritorious Winner** (**top 10%**) in Mathematical Contest in Modeling. 2017

Teaching Experiences

- **Teaching Assistant** of *COMS6998 Topics in Robot Learning* in Columbia. 2019 Fall
- **Teaching Assistant** of *MS105 Data Structure* in SJTU. 2017 Spring
- **Assistant Coach** of ACM-ICPC Team in SJTU. 2017 - 2018

Technical Strengths

Programming Languages: Python, C/C++, Java, Pascal, JavaScript, MATLAB.

Toolkits / Software: Pytorch, Tensorflow, MXNet, Torch, Pybullet.