Aiyu Cui

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Education

University of Illinois at Urbana-Champaign — *Urbana, IL*

Pursuing **PH.D.** in **Computer Science** — *Aug. 2018 - Present*

- Supervised by **Prof. Svetlana Lazebnik**

Pennsylvania State University — *State College, PA*

B.S. Honor in **Computer Science** and Minor in Mathematics (**Cumulative GPA: 3.89/4.00**) — *Aug. 2014 - May 2018*

- Honor Thesis: Multiple Objects Tracking
- Supervised by **Profs. Robert Collins** and **Yanxi Liu**

Selected Research Experience

Computer Vision Group (UIUC) — *Urbana,IL*

Graduate Research Assistant, supervised by Dr. **Svetlana Lazebnik** — *Aug. 2018 - Present*

- Work on non-trivial image similarity detection, i.e, detecting objects not in the same category but visually similar
- Train deep neural nets to be sensitive to multiple visual concepts (colors, shapes...)
- Cluster images based on abstract visual concepts in a latent space by interpretable decomposition

Laboratory for Perception, Action and Cognition (Penn State) — *State College, PA*

Undergraduate Researcher,supervised by Drs. **Robert Collins** and **Yanxi Liu** — *April 2017 - June 2018*

- Speed up MoCap data cleaning process 20 times by Kalman filter and tracking with human body constraints
- Evaluate multiple human skeleton representations including quaternions, Euler angles, relative joints and etc.
- Quantitatively analyze martial art skill level of subjects and give feedback to improve
- Develop a human stability metrics by using 3D MoCap and foot pressure data via collaboration with biomechanics
- Predict stability of human subjects from MoCap data via machine learning
- Collect motion capture data through Vicon Nexus

Selected Projects

Deep Learning / Machine Learning — *Oct. 2016 - Apr. 2017, Aug 2018 - Present*

- **Faster RCNN** - Reimplement Faster RCNN with PyTorch
- **Action Recognition** - Achieve over 80% accuracy on UCF-101
- **GAN** - Analyze and visualize how GAN can make the discriminator learn more human-understandable weights
- **Deep Ranking** - Achieve above 60% top 30 recall on tiny-ImageNet for similarity retrieval
- **ResNet from scratch** - Achieve above 60% accuracy on CIFAR100
- **CNN from scratch** - Achieve 90% accuracy on CIFAR10
- **Text Generation (NLP)** - Generate meaningful sentences by learning from a given book via Markov Model

Graphics (OpenGL) — *Aug. 2017 - Dec. 2017*

- **Roller Coaster** - Generate a short movie about a Roller Coaster moving along tracks given, in a skybox (3D)
- **Ray Tracer** - Correctly generate images, given multiple objects in different materials and different light sources (3D)
- **Texture synthesis** - Synthesize large image of texture given a small texture input

Skills

Programming Language/Tools

- **Python**,**Matlab**, C/C++, LaTeX, HTML/CSS
- Pytorch, CUDA, OpenGL, Vicon Nexus, Django, Visual Studio, Azure