Aiyu Cui

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Education

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

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

Pennsylvania State University — *State College, PA*

B.S. Honor in **Computer Science** and Minor in Mathematics (Graduated with **Magna Cum Laude**) — *Aug. 2014 - May 2018*

Selected Research Experience

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

Graduate Research Assistant — *Aug. 2018 - Present*

- Conduct research on human-centric scene understanding supervised by Prof. ***Svetlana Lazebnik***
- Focus on deformable human body part detection and fashion/clothing segmentation and synthesis
- Leverage deep learning and large-scale dataset

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

Undergraduate Researcher — *April 2017 - June 2018*

- Conduct research on 3D motion analysis on motion capture data supervised by Profs. ***Robert Collins*** and ***Yanxi Liu***
- Collect motion capture data through Vicon Nexus
- Speed up MoCap data cleaning 20 times by Kalman filter and tracking with human body constraints
- Compare different human skeleton representations including quaternions, Euler angles, relative joints and etc.
- Quantitatively analyze the skill level of subjects on performance sports from MoCap data 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

Selected Projects

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

- **Animal Classification** - Achieve 90% accuracy by finetuning CNN trained on ImageNet using SVM and MLP
- **MNIST Classification** - Achieve 98% accuracy by CNN implemented from scratch
- **CIFAR10 Classification** - Achieve 90% accuracy by CNN implemented from pytorch
- **Spam Filter (NLP)** - Achieve 98% accuracy on email spam filtering by Naive Bayes
- **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

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

Topics

- 3D geometry, motion capture, computer vision, scene understanding, motion analysis, machine learning and graphics