

YE YUAN

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RESEARCH INTERESTS

My main research interests lie in computer vision, reinforcement learning and deep learning. Previously, I was also interested and had a good amount of experience in graphics, motion planning and character animation.

EDUCATION

Carnegie Mellon University
Ph.D. in Robotics

Aug. 2017 - Present
Advisor: Prof. Kris Kitani

Carnegie Mellon University
M.S. in Computer Science, GPA: 3.96/4.00

Aug. 2015 - Dec. 2016
Advisor: Prof. Stelian Coros

Zhejiang University, China
B.E. in Computer Science and Technology, GPA: 3.81/4.00

Aug. 2011 - Jun. 2015
Advisor: Prof. Kun Zhou

PUBLICATIONS

Computational Design of Transformables [paper] [video]

Ye Yuan, Changxi Zheng, Stelian Coros
ACM Transactions on Graphics (TOG), Submitted

Computational Abstractions for Interactive Design of Robotic Devices [paper] [video]

Ruta Desai, Ye Yuan, Stelian Coros
IEEE International Conference on Robotics and Automation (ICRA), 2017

Continuous Optimization of Interior Carving in 3D Fabrication [paper]

Yue Xie, Ye Yuan, Xiang Chen, Changxi Zheng, Kun Zhou
Frontiers of Computer Science, 2016

RESEARCH EXPERIENCE

Disney Research Pittsburgh
Advisor: Prof. Stelian Coros

Feb. 2017 - Jul. 2017

- Devised a platform that generates vivid walking, trotting and turning motions for quadrupeds via robust motion planning and IK post-processing. It also creates transitional motions between different gaits thus allowing path following tasks and seamless navigation of the motion graph.

Robotics Institute, Carnegie Mellon University
Advisor: Prof. Stelian Coros

Mar. 2016 - Jan. 2017

- Explored algorithms for automatic generation of transformable robots. Devised a computational design system for interactive generation of custom robotic devices. Improved motion planning of designed robots.

State Key Laboratory of CAD&CG, Zhejiang University
Advisor: Prof. Kun Zhou

Jun. 2014 - Jul. 2015

- Explored continuous optimization for interior carving in 3D fabrication. Implemented multiple algorithms from SIGGRAPH papers, topics including point cloud denoising, skeletal rigging, cuboid-based scene understanding.

PROJECTS

Parametrized Robot Design Optimization [Robotics]

Jan. 2017 - Feb. 2017

- Based on the interactive robotic design system, added parametrized brackets and connectors that allow changes to the robot morphology. The design is then optimized based on structural stability and motion planning tasks. The system directly outputs fabricatable geometries of the design.

Computational Design System for Transformable Robots [Robotics]

Jun. 2016 - Jan. 2017

- Given a folded shape and a robot skeleton, our system automatically generate robots that can transform between two states in a collision-free manner. The robot can fold into the user-specified shape. When it is unfolded, it performs its normal functionalities, such as walking.

Interactive Design System for robotic devices [Robotics]

Jun. 2016 - Sep. 2016

- Devised a design system that uses computational abstractions to connect off-the-shelf modular components and 3D-printed parts into robotic devices. The user can make robots in a drag-and-drop fashion. The system also supports inverse design by search algorithms based on our flexible abstractions.

Robot Motion Planning with Ground Reaction Force [Robotics]

Mar. 2016 - Jun. 2016

- Created a motion planning system based on ground reaction force. Given high level goals such as walking forward or turning, the system can quickly generate motion plans that can be used to validate designed robots.

Distributed GPU Ray Tracing [Graphics]

Feb. 2016 - May. 2016

5th place among 100 teams in CMU Annual Parallelism Competition

- Implemented a GPU Ray Tracer in CUDA that supports Monte Carlo sampling, multiple types of BSDFs and lights. It can achieve a throughput of 275+ Mrays/s on GTX 680 for a scene with 100K+ triangles. It also supports parallel building of Bounding Volume Hierarchy (BVH) and distributed rendering across a cluster.

Image Captioning on Domain Specific Datasets [Vision]

Sep. 2015 - Dec. 2015

- Built an image captioning system based on VGGnet and attention-based LSTM model. Used boosting methods to combine multiple LSTMs trained on reweighted data to improve performance.

Glasses Only For You [Vision, Graphics]

Apr. 2015 - Jul. 2015

- Built a system that can produce most fitted glasses based on a person's scanned head data. It can either use Kinect Fusion or SLAM system to generate accurate head model. It utilized both 2D face features in the image and 3D geometric features to adjust the proportion of different parts. The final glasses is 3D-printed.

Continuous Optimization of Interior Carving in 3D Fabrication [Graphics]

Oct. 2014 - Jan. 2015

- Devised a continuous interior carving method using surface tracking to generate models that have certain physical properties, *e.g.*, it can float at a certain pose.

Cuboid-based Scene Understanding [Vision]

Aug. 2014 - Sep. 2014

- Implemented and enhanced a scene understanding algorithm based on cuboid proxy. Used GLSL shader to effectively evaluate the visibility constraint. Decreased the time and spatial complexity in solving static equilibrium by establishing a tree structure of cuboids.

Surface Reconstruction from Noisy Point Cloud [Graphics]

Jun. 2014 - Jul. 2014

- Implemented a surface reconstruction method on GPU. Point cloud data is denoised by continuous locally optimal projection based on Gaussian Mixture Model. Reconstructed surface efficiently using Radial Basis Function, Partition Of Unity, and Marching Cubes.

Multi-platform 3D Face Modeling from Single Picture [Vision]

Mar. 2014 - Oct. 2014

- Implemented an algorithm to reconstruct 3D face models using a single photo. Utilized Active Shape Model to determine 2D feature points. Built Apps across IOS, android and Windows.

SKILLS

Programming Language C/C++, Python, Java, Matlab, GLSL
Framework OpenAI gym, Mujoco, DART, rllab, pyTorch, CUDA, Eigen, libigl, CGAL, Alglib, OpenCV, OpenGL, Boost, Qt, ffmpeg

ACTIVITIES

- Technical Support, Wenqin Artistical Troup of Zhejiang University** Sep. 2013 - July. 2014
- Offered support in medias, photographs and website building.
- Vice President, Computer and Programming Club** Sep. 2013 - July. 2015
- Jointly established the club for computer and programming lovers, planned club activities bi-weekly.

HONORS

Excellent Undergraduate Thesis of Zhejiang University 2014

Outstanding Achievement in the 2014 SRTP of Zhejiang University 2014

First Prize in China National Innovative Physics Competition 2013

First Class Academic Excellence Scholarship 2012

Merit Student 2012, 2013, 2014