

Rui Yu

Staff Research Engineer at Apple | Computer vision & machine learning

cvyurui@gmail.com | cvfish.github.io | github.com/cvfish | Google Scholar

I work on 3D computer vision and machine learning, with a particular interest in understanding the geometry and motion of the world from images and video.

EXPERIENCE

Staff Research Engineer | Apple

February 2019 - present

Computer vision and machine learning. Previously Computer Vision Engineer.

Computer Vision Engineer | DJI

2017 - January 2019

3D computer vision.

EDUCATION

PhD in Computer Vision | University College London

2013-2017

Advisors: Lourdes Agapito and Chris Russell.

Doctoral research in Computer Vision | Queen Mary University of London

2012-2013

Advisors: Lourdes Agapito and Chris Russell. Continued doctoral research at UCL.

Master's degree in Computer Vision | Northwestern Polytechnical University

2009-2012

Advisors: Yanning Zhang and Tao Yang.

Bachelor's degree in Computer Science | Northwestern Polytechnical University

2005-2009

SELECTED PUBLICATIONS

Better Together: Joint Reasoning for Non-rigid 3D Reconstruction with Specularities and Shading

Qi Liu-Yin, Rui Yu, Lourdes Agapito, Andrew Fitzgibbon, Chris Russell | BMVC 2016 | Best Poster

Solving Jigsaw Puzzles with Linear Programming

Rui Yu, Chris Russell, Lourdes Agapito | BMVC 2016 | Oral

Direct, Dense, and Deformable: Template-Based Non-Rigid 3D Reconstruction from RGB Video

Rui Yu, Chris Russell, Neill D. F. Campbell, Lourdes Agapito | ICCV 2015

Video Pop-up: Monocular 3D Reconstruction of Dynamic Scenes

Chris Russell*, Rui Yu*, Lourdes Agapito | ECCV 2014 | Oral

Continuously Tracking and See-through Occlusion Based on a New Hybrid Synthetic Aperture Imaging Model

Tao Yang, Yanning Zhang, Xiaomin Tong, Xiaoqiang Zhang, Rui Yu | CVPR 2011

Rui Yu

Research, engineering projects & technical background

RESEARCH

Learning Dense 3D Models from Monocular Video

PhD thesis, University College London. Dense 3D reconstruction of dynamic scenes and deformable objects using a single camera.

Vision-based autonomous landing of an unmanned aerial vehicle

Master's thesis. A real-time vision-based autonomous landing system.

EARLIER ENGINEERING PROJECTS

Real-time multi-view 3D reconstruction

A multi-camera reconstruction system that shares vertices during voxel splitting. The original system achieved 10 frames per second with eight cameras on an Intel i7-950 PC with 4 GB of RAM.

Vision-based autonomous UAV landing

A real-time landing system using a visible high-brightness flashlight for localization at distances up to 400 metres, including strong lighting conditions. Demonstrated autonomous landings without differential GPS and participated in the AVIC Cup International UAV Innovation Grand Prix.

Seeing and tracking through occlusion

A real-time system combining multi-camera detection, synthetic aperture imaging, and multi-person tracking. A hybrid imaging model helps locate and observe people in challenging, occluded scenes. Research published at CVPR 2011.

TECHNICAL INTERESTS & TOOLS

3D reconstruction | Structure from motion | SLAM | Non-rigid reconstruction | Camera arrays | Linear programming | Nonlinear least squares | Graph cuts | C++ | Python | PyTorch | OpenCV | Ceres Solver | OpenGL

OPEN SOURCE

PangaeaTracking

github.com/cvfish/PangaeaTracking

Dense, template-based deformable 3D tracking.

VideoPopup

github.com/cvfish/VideoPopup

Monocular reconstruction of dynamic scenes.

PyTorch DeMoN

github.com/cvfish/pytorch_demon

Code linked from my previous CV.

AWARDS & SCHOLARSHIPS

- BMVC 2016 Best Poster Award - Better Together
- UCL PhD Studentship, 2013-2017
- QMUL PhD Studentship, 2012-2013
- Outstanding Master Dissertation Award, NWPU, 2012
- First Rank Grant, NWPU, 2009-2011
- Yingcai Scholarship, NWPU, 2005-2009
- National Scholarship, 2005-2006