Ruizhe Wang

Research Scientist

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SUMMARY

Research scientist with passion and dedication in developing AIGC technologies for 3D computer vision and virtual humans. Current research interests include 3D Generative Models, Diffusion Models, Neural Radiance Field (NeRF), and Avatar Creation.

EXPERIENCE

ObEN, Inc., Pasadena, CA - *Principal Research Scientist, Team Lead*

May 2017 - Present

- Constructed a cloud-based Unity SDK that supports high-fidelity 3D avatar creation from a single selfie and accessory customization.
- Developed generative 3D face model with deferred neural rendering.
- Developed methods for audio driven automatic lip syncing and gesture generation.
- Built image translation neural networks for style transfer on facial images, including beautification and other semantic editing.

University of Southern California, Los Angeles, CA - *Research Assistant*

May 2012 - May 2017

- Introduced a novel pairwise range image registration algorithm, by utilizing the visibility and occlusion information, to successfully register range images with as few as 15% overlap.
- Developed an end-to-end system for reconstructing complete watertight and textured models of moving subjects, such as clothed humans and animals, using only three or four handheld depth sensors.
- Developed an end-to-end 3D full body scanning station by using only a single commodity RGB-D camera, hence enabling multiple home-based 3D avatar applications
- Built an end-to-end home monitoring and evaluation system for patients with Parkinson's Disease.

HP Lab, Palo Alto, CA - *Research Intern*

May 2015 - August 2015

- Integrated multi-view photometric stereo techniques into the HP Sprout workstation for a novel 3D sensing approach.

- Developed an end-to-end 3D modeling system with the proposed 3D sensing technique.

DAQRI, Mountain View, CA - *Research Intern*

May 2014 - August 2014

- Proposed a novel 3D feature to better incorporate the object's distinctive global information.
- Introduced a new classification-voting procedure on top of the 3D features to detect objects in RGB-D images, which outperformed other state-of-the-art methods. Research result published in *IROS 2015*.

EDUCATION

University of Southern California, Los Angeles, CA - *Ph.D.*

May 2012 - May 2017

Computer Science Advisor: *Gérard Medioni*

California Institute of Technology, Pasadena, CA - *M.S.*

October 2010 - Dec 2011

Electrical Engineering Advisor: *Yaser Abu-Mostafa*

Tsinghua University, Beijing, China - *B.E.*

August 2006 - July 2010

Electrical Engineering

SKILLS

Programming Languages: Python, Matlab, C, C++, C#, MySQL, HTML/CSS

Common Libraries: PyTorch, TensorFlow, NumPY, Scikit-Learn, Matplotlib, Librosa, OpenCV, Dlib, VTK, Point Cloud Library (PCL), Eigen, PyMesh, Visdom, etc.

Operating Systems: Linux, Windows, Mac OS

Softwares: Git, Latex, Unity3D

SELECTED PUBLICATIONS

- Ivan Himawan, **Ruizhe Wang**, Sridha Sridharan, Clinton Fookes, *"Jointly Trained Conversion Model with LPCNet for Any-to-One Voice Conversion using Speaker-Independent Linguistic Features"*, IEEE Access, 2022
- Xudong Liu, **Ruizhe Wang**, Hao Peng, Minglei Yin, Chih-Fan Chen, Xin Li, *"Face Beautification: Beyond Makeup Transfer",* Frontiers in Computer Science, 2022

- Xudong Liu, **Ruizhe Wang**, Hao Peng, Minglei Yin, Chih-Fan Chen, and Xin Li, "*Sparse Feature Representation Learning for Deep Face Gender Transfer*", ICCV Workshop, 2021
- **Ruizhe Wang***, Chih-Fan Chen*, Hao Peng, Xudong Liu, and Xin Li, "*Learning 3D Faces from Photorealistic Facial Synthesis*", 3DV, 2020
- **Ruizhe Wang**, Chih-Fan Chen, Hao Peng, Xudong Liu, Oliver Liu, Xin Li, "*Digital twin: Acquiring high-fidelity 3D avatar from a single image*", arXiv, 2019
- Chao Yang, Taehwan Kim, **Ruizhe Wang**, Hao Peng, and C.-C. Jay Kuo, "*Show, Attend and Translate: Unsupervised Image Translation with Self-Regularization and Attention*", Transactions on Image Processing, 2019
- Xudong Liu, Tao Li, Hao Peng, Iris Chuoying Ouyang, Taehwan Kim, and **Ruizhe Wang**, *"Understanding Beauty via Deep Facial Features"*, CVPR Workshop, 2019
- Chao Yang, Taehwan Kim, **Ruizhe Wang**, Hao Peng, and C.-C. Jay Kuo, *"ESTHER: Extremely Simple Image Translation Through Self-Regularization"*, BMVC 2018
- **Ruizhe Wang**, Lingyu Wei, Etienne Vouga, Qixing Huang, Duygu Ceylan, Gérard Medioni and Hao Li, "*Capturing Dynamic Textured Surfaces of Moving Targets*", spotlight presentation, ECCV 2016
- **Ruizhe Wang**, Gérard Medioni and Wenyi Zhao, "*Surface Oriented Traverse for Robust Instance Detection in RGB-D*", IROS 2015
- **Ruizhe Wang**, Jongmoo Choi and Gérard Medioni, "*3D Modeling from Wide Baseline Range Scans using Contour Coherence*", CVPR 2014
- Ari Shapiro, Andrew Feng, **Ruizhe Wang**, Hao Li, Mark Bolas, Gérard Medioni and Evan Suma, "*Rapid Avatar Capture and Simulation using Commodity Depth Sensors*", CASA 2014
- **Ruizhe Wang**, Matthias Hernandez, Jongmoo Choi and Gérard Medioni, "*Accurate 3D Face and Body Modeling from a Single Fixed Kinect*", 3DBST, 2013
- **Ruizhe Wang**, Gérard Medioni, Carolee J Winstein and Cesar Blanco, "*Home Monitoring Musculo-Skeletal Disorders with a Single 3D Sensor*", CVPR Workshop, 2013
- **Ruizhe Wang**, Jongmoo Choi and Gérard Medioni, "*Accurate Full Body Scanning from a Single Fixed 3D Camera*", 3DV, 2012

DEMOS, TALKS & EXHIBITIONS

- Dan Casas, Oleg Alexander, Andrew Feng, Graham Fyffe, Ryosuke Ichikari, Paul Debevec, **Ruizhe Wang**, Evan Suma, Ari Shapiro, "*My Digital Face*", SIGGRAPH Real-Time Live! 2015
- Dan Casas, Oleg Alexander, Andrew Feng, Graham Fyffe, Ryosuke Ichikari, Paul Debevec, **Ruizhe Wang**, Evan Suma, Ari Shapiro, "*Blendshapes from Commodity RGB-D Sensors*", SIGGRAPH Talks 2015
- Ari Shapiro, Andrew Feng, **Ruizhe Wang**, Hao Li, Mark Bolas, Gerard Medioni, Evan Suma, *"Make Your Own Avatar"*, SIGGRAPH Real-Time Live! 2014

- Ari Shapiro, Andrew Feng, **Ruizhe Wang**, Hao Li, Mark Bolas, Gerard Medioni, Evan Suma, *"Rapid Avatar Capture and Simulation Using Commodity Depth Sensors"*, SIGGRAPH Talks 2014
- Ari Shapiro, Andrew Feng, **Ruizhe Wang**, Gerard Medioni, Evan Suma, *"Automatic Acquisition and Animation of Virtual Avatars"*, IEEE VR 2014 Research Demo, *Honorable Mention*

PATENTS

- Evan Suma, Gérard Medioni, Mark Bolas, Ari Y Shapiro, Wei-Wen Feng, **Ruizhe Wang**, *"Rapid avatar capture and simulation using commodity depth sensors"*, US11195318, Grant
- Gérard Medioni, **Ruizhe Wang**, and Jongmoo Choi, "*Three-dimensional modeling from wide baseline range scans"*, US9940727B2, Grant
- Gérard Medioni, Jongmoo Choi, and **Ruizhe Wang**, "*3D body modeling from one or more depth cameras in the presence of articulated motion",* US9418475B2, Grant

PROFESSIONAL ACTIVITIES

- Reviewer for *Conference on Computer Vision and Pattern Recognition (CVPR)* 2020, 2021, 2022, 2023
- Reviewer for *European Conference on Computer Vision (ECCV)* 2020, 2022
- Reviewer for *International Conference on Computer Vision (ICCV)* 2019, 2021, 2023
- Reviewer for *International Joint Conference on Artificial Intelligence (IJCAI)* 2019
- Reviewer for *IEEE Winter Conference on Applications of Computer Vision (WACV)* 2015, 2016, 2017, 2018, 2019
- Reviewer for *SIGGRAPH* 2016
- Reviewer for *IEEE Transactions on Mobile Computing (TMC)* 2015
- Reviewer for *Computer Vision and Image Understanding (CVIU)* 2015
- Reviewer for *International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision (WSCG)* 2014

TEACHING

- CalTech Physics (Ph) 1.a Classical Mechanics and Electromagnetism, *Fall 2010*
- CalTech Physics (Ph) 8.b Experiments in Electromagnetism, *Winter 2011*
- CalTech Physics (Ph) 8.c Experiments in Electromagnetism, *Spring 2011*