Zhiyuan ZHANG

Ph.D, Assistant Professor

cszyzhang@gmail.com

https://cszyzhang.github.io

Ningbo Research Institute, Zhejiang University, Ningbo, China

Research Interests

Computer Vision / Graphics, Pattern Recognition, Machine Learning, 3D Point Cloud Deep Learning, 3D Shape Abstraction, 3D Shape Denoising, Biometrics

Honors & Awards

- Ningbo High Level Talent ("3315 Plan"), 2020-Present
- Shenzhen Peacock Program for Overseas High-Level Talent, 2016 - 2020
- Pilot talent (Nanshan District, Shenzhen City), 2016 - 2020
- NUS Research Full Scholarship, 2010 - 2014
- The Hope Star of Science and Technology, Yanshan University, 2003

WORK EXPERIENCE

Oct.2020 – Present

Assistant Professor

Ningbo Research Institute, Zhejiang University, China

- Leading a research lab with focus on 3D vision.

Oct.2017 – Sept, 2020

Research Fellow

Singapore University of Technology and Design, Singapore

- Designed algorithms on 3D point cloud deep learning, and proposed novel efficient and rotation invariant convolution operators for point cloud understanding.
- Actively involved in the "AI in Metrology" project by designing innovative deep learning neural networks to generate CAD models, and matching between the CAD model and manufacturing model.
- Wrote academic papers, and supervised students.

Aug.2014 –Nov.2017

Staff Researcher

Lenovo Group Ltd. Hong Kong Research Centre

- Focused on computer vision projects with applications on dual camera calibration, image fusion, background blur, foreground enhancement, and so on.
- Proposed new ideas on product related problems and wrote patents

Oct.2008 –Oct.2009

Visiting Scholar

Department of Computing, The Hong Kong Polytechnic University

- Worked on '2D multi-view ear detection and recognition'.
- Designed system for online 3D ear point cloud capture and designed algorithm for 3D ear recognition

Aug.2005 –Jul.2006

Training Specialist

Shidai Computer Technique Training School, Qinhuangdao City, China

- Taught courses on C++ and Visual Basic
- Instructed students to pass the National Computer Rank Examination

EDUCATION

Aug.2010 – May.2015

Doctor of Philosophy

National University of Singapore, Singapore

- thesis title: Improving Descriptors for 3D Shape Matching
- thesis url: https://scholarbank.nus.edu.sg/handle/10635/119782
- Focused on algorithms for both rigid and non-rigid 3D shape matching

Sep.2006 – Jul.2008 **Master's degree in Computer Science and Technology**
Harbin Institute of Technology, China
- Thesis Title: Reserch on Multi-View Ear Detection and Recognition (in Chinese).
- Focused on algorithms for biometrics e.g. ear detection and recognition

Sep.2001 – Jul.2005 **Bachelors's degree in Computer Science and Technology**
School of Information Science and Engineering, Yanshan University, China

SKILLS

Languages Chinese – Native
English – Full professional proficiency

Programming C++, Python, MatLab, TensorFlow, MXNet, Pytorch, VTK

Communication Excellent teaching and presentation ability
Well collaboration with team members
Active collaboration with external researchers

Publications

- **Zhiyuan Zhang**, Binh-Son Hua, Sai-Kit Yeung. "RIConv++: Effective Rotation Invariant Convolutions for 3D Point Clouds Deep Learning", International Journal of Computer Vision (**IJCV**), 2022
- Xin Zhong, **Zhiyuan Zhang**. "3D Dental Biometrics: Automatic Pose-Invariant Dental Arch Extraction and Matching", International Conference on Pattern Recognition (**ICPR**), 2021
- **Zhiyuan Zhang**, Binh-Son Hua, Wei Chen, Yibin Tian, Sai-Kit Yeung. "Global Context Aware Convolutions for 3D Point Cloud Understanding", International Conference on 3D Vision (**3DV**), 2020, **Oral**
- **Zhiyuan Zhang**, Binh-Son Hua, Sai-Kit Yeung. "ShellNet: Efficient Point Cloud Convolutional Neural Networks using Concentric Shells Statistics", International Conference on Computer Vision (**ICCV**), 1607-1616, 2019, **Oral**, **Accept Rate: 4.3%**
- **Zhiyuan Zhang**, Binh-Son Hua, David W. Rosen, Sai-Kit Yeung. "Rotation Invariant Convolutions for 3D Point Clouds Deep Learning", International Conference on 3D Vision (**3DV**), 204-213, 2019, **Spotlight**
- **Zhiyuan Zhang**, Duc Thanh Nguyen, Lap-Fai Yu, Sai-Kit Yeung, Daniela Rus. "Creating Annotated Scene Meshes for Training and Testing Robot Systems", International Conference on Intelligent Robots (**IROS**) Tutorial, 2018
- **Zhiyuan Zhang**, Sim Heng Ong, Xin Zhong, Kelvin W.C. Foong. "Efficient 3D Dental Identification via Signed Feature Histogram and Learning Keypoint Detection", Pattern Recognition (**PR**), Volume 60, 189-204, 2016
- **Zhiyuan Zhang**, KangKang Yin, Kelvin W.C. Foong. "Symmetry Robust Descriptor for NonRigid Surface Matching", Computer Graphics Forum (Proc. **Pacific Graphics**), Volume 32,Issue 7, 355-362, 2013, **Accept Rate: 19%**
- **Zhiyuan Zhang**, Xin Zhong, Sim Heng Ong, Kelvin W.C. Foong. "An Efficient Partial Shape Matching Algorithm for 3D Tooth Recognition", The 15th International Conference on BioMedical Engineering (**ICBME**), 785-788, 2013
- **Zhiyuan Zhang**, Sim Heng Ong, Kelvin W.C. Foong. "Improved Spin Images for 3D Surface Matching using Signed Angles", IEEE International Conference on Image Processing (**ICIP**), 537-540, 2012
- Heng Liu, David Zhang, **Zhiyuan Zhang**. "Multi-view Ear Recognition Based on Moving Least Square Pose Interpolation", Lecture Notes in Computer Science (Proc.**ICIC**), Volume 5755: 1085-1095, 2009
- **Zhiyuan Zhang**, Heng Liu. "Multi-view Ear Recognition Based on B-Spline Pose Manifold Construction", The 7th World Congress on Intelligent Control and Automation (**WCICA**): 2416-2421, 2008

Professional Activities

- **Committee Member** for Siggraph Asia 2019 Courses
- **Invited Reviewer** for IROS 2020, Pacific Graphics 2019, 3DV 2019, ICRA 2019, Advanced Engineering Informatics, Pattern Recognition, Neural Computing and Applications

Patents

- **Zhiyuan Zhang**. Title: An information processing method and a electronic device, Patent No.: CN 106303203 B, 2015, China
- **Zhiyuan Zhang**. Title: An image fusion method and device, Patent No.: CN 106296624 A, 2015, China
- Wei Liu, **Zhiyuan Zhang**. Title: A method for image processing, Patent No.: CN 107644228 A, 2017, China
- **Zhiyuan Zhang**, Hao Li, Fan Zhang. Title: Image processing method and device, Patent No.: CN 108024062 A, 2017, China

Projects

- **AI in Metrology**, National Research Foundation, 332,880 SGD, Apr.2018-Mar.2020, Contributions: Designed generative neural networks to generate new CAD models; Designed efficient and rotation invariant convolution operators for 3D point cloud deep learning with applications on matching between CAD model and manufacturing model, point cloud classification and semantic segmentation.
- **Shape Matching and Deformation Modeling for Kinect Depth Data**, MSRA UR Project, 55,000 USD, May.2013-Jul.2014, Contributions: Focused non-rigid shape matching algorithms, proposed new non-rigid shape descriptors to match shape with severe deformation, and solve the symmetry flipping problem.

Additional Info

References Available on request

Hobbies Chess, Running, Reading, Travel