Xiaoshui Huang

0451226172 ⬦ Xiaoshui.Huang@uts.edu.au

Sydney, NSW, Australia

http://xiaoshuihuang.weebly.com

Career Objective

I have a research background in computer vision and machine learning. I am professional in computer vision tasks and machine learning tools. I am going to finish my PhD study from UTS. Seeking to build on strong research skills gained through studies so far as a Researcher Scientist in a leading research center or industry. Ambition is to eventually have a broad-based academic career including teaching, research and management responsibilities.

Education

PhD in Computer Science & Engineering   **Feb 2015 - July 2018**
University of Technology Sydney(UTS), Australia
"Cross-source point cloud matching"

Key features of research:

- Development of algorithms that extract structures of 3D point clouds by using 3D segmentation.

- Design of algorithms that align 3D cross-source point clouds based on 3D structures.

- Propose algorithms that conduct the registration of 3D cross-source point clouds based on statistic model.

- Use deep learning to extract descriptor of 3D point clouds.

- Published 7 papers including two journals IEEE T-IP and IEEE T-CSVT. T-IP work is to use structure information to align cross-source point clouds and T-CSVT work is to build statistic model to align cross-source point clouds.

Master in Computer Science   **Sep 2011- Jan 2014**
Shenyang Aerospace University, China
"Research on Automatic Stitching of Aerial Image and Correction Algorithm"

Key features of research:

- Improvement of algorithm that extract features of 2D images.

- Proposed an algorithm to mosaic aerial images.

- Developed image recognition system by using support vector machine (SVM).

- Programmed an image mosaic system.

- Published one conference paper. It is to use pyramid features to quickly mosaic aerial images.

Bachelor in Geometric Information System (GIS)   **Sep 2006- July 2010**
Taiyuan University of Technology, China

- Final year project: Programmed a GIS system to calculate the statistic information of land usage.

- Object-oriented programming and advance mathematics

Research Interests

My principal research interests lie in the field of data analysis, computer vision and robotic vision, deep learning and statistical modeling as well as similar 3D computer vision techniques such 3D segmentation, 3D classification and 3D detection. My future research plans are to build on the foundations of my PhD to further investigate vision intelligent using cross-source data and the tools such as deep learning and probabilistic graphical models.

Teaching Experiences

Academic and Tutor   **Feb 2016 - 2018**
UTS

- Taught the subject of Real-time Operating System: Design of lab, design of course assignment, marking and tutorial of linux operating system programming.

- Taught the subject of Telecommunication Networks Management: Design of assignment and marking.

Skill Developed:

- Assisted academic staff with organizing and delivering teaching materials as well as occasional marking and commenting on coursework and reporting back to students and lecturers. For example, I programed many example code and give tutorials for better coding skill after the marking of programing for the RTOS course. I also help the staff to prepare the recent development of the course.

- Responsible for planning of teaching of technical academic material to undergraduate and post-graduate students during the laboratory sessions. For example, to synchronize with the course coordinate, I need to plan the lab content and design teaching materials.

- Accurate and in depth knowledge of the taught material plus extended teaching & communication abilities, patience and responsibility. For example, to help the students to get the knowledge of recent development of TNM, I looked through many papers and websites and prepared several elegant slides for the academic staff. Also, I was very patience to explain the contents to students.

Work Experience

Postdoctoral Research Associate   **September 2019 - Present**
University of Sydney:

- Research: I am conducting research on data mining to improve health care for cancer patients.

- Cooperation: Cooperating with Ingham institute and two Universities in China.

Supervisor: Professor Paul Keall

Researcher (part-time)   **September 2019 - Present**
Ingham Institute:

- Research: 1. deep learning on medical image; 2. data mining on improving lung cancer health care.

- Cooperation: Cooperating with Dr. Matthew Field.

Supervisor: A/Professor Lois Holloway

Research Fellow   **January 2019 - September 2019**
University of Technology Sydney:

- Research: I am conducting research on Computer vision and Artificial intelligence. More specifically, 3D point cloud registration, 3D semantic segmentation, shape analysis.

- Leadership: Supervised and helped PhD students to achieve their research goals.

- Cooperation: Cooperating with two Australia companies and several Universities around the world.

- Teaching: I take the responsible of Lab teaching of Real-time operating system.

Supervisor: Associate Professor Jian Zhang

Casual Engineer   **June 2018 - January 2019**
Laing Orourke:

I take part in a reality insight project in Laing O'rourke construction company. By using VR/AR technologies, the project serves for house-based business. In this project, I take responsible for the following tasks:

- 1. 3D object classification. More specifically, I use deep neural network to extract the descriptor of 3D input point cloud, and use the descriptor to do the object classification.

- 2. 3D Indoor localisation. I can locate the position and orientation in the indoor environment by using no sequence data. For example, we capture one scan of a building, I can accurately locate where I am and what the orientation I am in the big building.

- 3. 4D contract evaluation. I use computer vision and machine learning technologies to automatically evaluate the 4D contract of construction on daily basis. The accuracy is higher than current human based evaluation on building construction. Also, the evaluation could be daily basis.

Supervisor: Monica, Hanus-Smith

Research Scientist Internship   **July 2018 - December 2018**
Rapiscan Systems:

I take part in a research project in Rapiscan systems company. The project name is "Research into 3D X--ray screening to support productive and efficient processes in the meat industry". By using image processing and 3D deep learning technologies, the project serves for the business of security, medical and meat industry. In this project, I take responsible for the following tasks:

- 1. 3D medical volume data segmentation. More specifically, I use deep neural network to extract the descriptor of 3D CT volume data and use neural network to do the segmentation.

- 2. 3D texture analysis. More specifically, when I got a CT scan of an animal, I can automatically decide which region is bone and which region is tissue. Using this technology, I can estimate "Lean Meat Yield", "Animal Health" and "Eating Quality".

- 3. 3D classification. More specifically, I use deep learning neural network to automatically classify the 3D object from CT scan. Such as fruit object classification.

Supervisor: Loic and Kevin

Research Assistant   **Feb 2014 - Feb 2015**
Tsinghua University:

- Funding application: I applied an International Science and Technology Cooperation Projects. Project name: "Sub-pixel Fast Stereo Matching Algorithm and Implementation".

- Students Supervision: Helped master students in their research direction and methodology

- Research on stereo matching: Developed algorithms and shared ideas with colleagues.

Supervisor: Associate Professor Chun Yuan

Selected Awards

UTS

- International research scholarship: awarded for research project from UTS

- Faculty of Engineering and Information Technology Scholarship: awarded for research project from UTS

- FEIT One-off Research Scholarship: awarded for research publication. 2015, 2016, 2017

- Higher Degree by Research Publication Award: awarded for 2017 high degree research publications.

Industry

- Nokia Industrial Awards: awarded for the patent granted between UTS and Nokia. 2017

Technique Skills

- **Mathematic**: Statistic, Linear Algebra, Machine Learning, Probabilistic Graphical Models and Convex Optimization.

- **Programming**: Python, C++, Matlab,

- **Softwares**: Tensorflow, PyTorch, Visual Studio, 3D Max and Photoshop.

Professional Service

Journal Reviewer:

- IEEE Transactions on Image Processing
  IEEE Transactions on Circuits and Systems for Video Technology
  IEEE Transactions on Multimedia
  IEEE Sensors Journal
  IEEE MultiMedia
  EURASIP Journal on Image and Video Processing

Conference Reviewer:

- International Conference on Multimedia Expro
  Computer Vision and Pattern Recognition Workshop
  International Conference on Image Processing
  International Conference on Digital Image Computing: Techniques and Applications

Publications

Journals:

- **Xiaoshui Huang**, Lixin Fan, Qiang Wu, Jian Zhang, Chun Yuan. A coarse-to-fine algorithm for matching and registration in 3D cross-sourced point clouds. Accepted by Transactions on Circuits and Systems for Video Technology (T-CSVT). 2017

- **Xiaoshui Huang**, Jian Zhang, Lixin Fan, Qiang Wu, Chun Yuan. "A Systematic Approach for Cross-Source Point Cloud Registration by Preserving Macro and Micro Structures," in IEEE Transactions on Image Processing (T-IP), vol. 26, no. 7, pp. 3261-3276, July 2017.

Conferences:

- Anan Du, **Xiaoshui Huang**, Jian Zhang, Lingxiang Yao, Qiang Wu. KPSNET: Keypoint detection and feature extraction for point cloud registration. International Conference on Image Processing (ICIP) 2019.

- **Xiaoshui Huang**, Lixin Fan, Qiang Wu, Jian Zhang, Chun Yuan. Fast Registration for cross-source point clouds by using weak regional affinity and pixel-wise refinement. International Conference of Multimedia Expro (ICME) 2019.

- **Xiaoshui Huang**, Jian Zhang, Qiang Wu, Lixin Fan, Chun Yuan. A coarse-to-fine algorithm for registration in 3D street-view cross-source point clouds. In 2016 International Conference on Digital Image Computing: Techniques and Applications (DICTA) (pp. 1-6). IEEE.

- **Xiaoshui Huang**, Lixin Fan, Jian Zhang, Qiang Wu, and Chun Yuan, 2016. Real Time Complete Dense Depth Reconstruction for a Monocular Camera. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW) (pp. 32-37). IEEE.

- **Xiaoshui Huang**, Chun Yuan, and Jian Zhang, 2015, September. Graph Cuts Stereo Matching Based on Patch-Match and Ground Control Points Constraint. In Pacific Rim Conference on Multimedia (PCM) (pp. 14-23). Springer International Publishing.

- **Xiaoshui Huang**, Jian Zhang, Qiang Wu, Chun Yuan, and Lixin Fan, 2015, November. Dense Correspondence Using Non-local DAISY Forest. In 2015 International Conference on Digital Image Computing: Techniques and Applications (DICTA) (pp. 1-8). IEEE.

- Shoujin Wang, Liang Hu, Longbing Cao, **Xiaoshui Huang**, Defu Lian, Wei Liu. Attention-based Transactional Context Embedding for Next-Item Recommendation. AAAi 2018.

Referees

Provided if it is requested