

# Shaodi You, Ph.D.

Senior Research Scientist, [Data61](#), CSIRO, Australia (NICTA)  
Senior Adjunct Lecturer, Australian National University  
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Research webpage: <http://users.cecs.anu.edu.au/~shaodi.you/>

## Leadership

Projects            Principle Investigator:  
Joint Research on Computer Vision and Perception for Autonomous Driving with [Zongmu](#).  
Deep Learning and Traditional Computer Vision Based Algorithms for ADAS: including Semantic Segmentation, Multi-task Detection, Underground SLAM, Panoramic Image Sticking and etc.

Supervising        - Ph.D. students:  
Kaiyue Lu, ANU (primary supervisor)  
Jing Zhang, ANU (primary supervisor)  
Peipei Song, ANU (primary supervisor)  
Changkun Ye, ANU (primary supervisor, pending visa)  
Xiudong Wang, ANU (visiting student, with [A/Prof. Hongdong Li](#))  
Hao Su, ANU (visiting student, with [A/Prof. Hongdong Li](#))  
Ryota Yoshihashi, U Tokyo (with [A/Prof. Takeshi Naemura](#))  
Xiang Wang, Tsinghua (co-supervising with [A/Prof. Huimin Ma](#))  
Yidong Wang, Tsinghua (with [A/Prof. Huimin Ma](#))  
  
- Research Master:  
Ziang Cheng, ANU  
Junxuan Li, ANU  
Seiichirou Fukuta, U Tokyo (with [Asst. Prof. Rei Kawakami](#))  
Kenta Moriwaki, U Tokyo (with [Asst. Prof. Rei Kawakami](#))  
Jiaming Wei, Tsinghua (with [A/Prof. Huimin Ma](#))  
  
- Honour  
Yicong Hong, ANU  
Yuxuan Long, ANU  
Xinyi Liu, ANU  
Oliver Johnson, ANU  
Zhipeng Bao, ANU (Visiting student from Tsinghua)  
Riku Shigematsu, ANU (Visiting student from U Tokyo)

- Alumni

David Feng, PhD, ANU (now at Seeing Machine)

Kaiyue Lu, Master, ANU (continue as PhD)

Chenyao Qian, Master, ANU (now at Meitu)

Tu Tuan Trinh, Master, U Tokyo

Zhichen Zhao, Master, Tsinghua

Weixuan Sun, Bachelor with Honor, ANU

Kunming Li, Bachelor with Honor, ANU

Organizing

General Chair, 2018 The IEEE International Conference on Digital Image Computing: Techniques and Applications (DICTA). Canberra, Australia.

Workshop Chair, 2018 Asian Conference on Computer Vision. (ACCV). Perth, Australia.

Program Chair, ICCV Joint Workshop: Physics Based Vision meets Deep Learning, Venice, Italy. [PBDL2017](#)

2016-present, Chair of Computer Society, ACT Section, IEEE.

-IEEE R10, Outstanding Small Section Award, 2017

2014 International Conference on 3D Vision (3DV2014). Tokyo, Japan.

Teaching

2018 Computer Vision (ANU, ENGN4528,ENGN6528)

2018 Advanced Research Project (ANU, COMP8800)

2018 Individual Project (ANU, ENGN4200)

2017 Robotics (ANU, ENGN4627)

2017 Data Analysis (ANU, ENG8735)

2017 Advanced Research Project (ANU, COMP8800)

2017 Individual Project (ANU, ENGN4200)

2016 Robotics (ANU, ENGN4627)

2016 Document Analysis (ANU, COMP4650)

2016 Individual Project (ANU, ENGN4200)

Reviewing

IEEE Transaction on Pattern Recognition and Machine Intelligence (TPAMI)

International Journal on Computer Vision (IJCV)

IEEE Transaction on Image Processing (TIP)

ACM SIGGRAPH

IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

International Computer on Computer Vision (ICCV)

European Conference on Computer Vision (ECCV)

Invited Talks Smart Computational Imaging, Nanjing University, Apr. 2017  
Smart Computational Imaging, Jiangnan University, Apr. 2017  
A Multi-view Light Field Camera from a Single Lens, Microsoft Research Asia, Sep, 2016  
Vision in Bad Weather and Prosthetic Vision, Peking University, Sep, 2016  
Vision in Bad Weather and Prosthetic Vision, Nankai University, Sep, 2016  
Prosthetic Vision and Artificial Vision, Microsoft Research Asia, Aug, 2016  
Vision in Bad Weather and Prosthetic Vision, Microsoft Research Asia, Aug, 2016  
Vision in Bad Weather and Prosthetic Vision, Tsinghua University, Aug, 2016  
Vision in Bad Weather and Prosthetic Vision, Jiangnan University, Aug. 2016  
Adherent Raindrop Detection and Removal in Video. Meeting on Image Recognition and Understanding (MIRU 2013), Japan.

Social Activities 2011-2012 Group Leader, Chinese Student Union, Tokyo University. Managing a group of 50+ students for international cultural exchange actives.

2006-2009 Group Leader, Red Cross Society, Tsinghua Branch. Managing a group of 15+ students for publicities online and offline. Including website, newspaper, posters and etc. Also managing events such as blood donation, first aid training and etc.

2007-2008 Group Leader, Class W54, Tsinghua University. Managing a group of 26 students for various events including sports competition, team building, and field study and community services.

2005-2007 Group Leader, Art Society, Tsinghua University. Managing a group of 30+ students for regular training in art and exhibitions.

2017-present, Member, ANU Chinese Classical Music Ensemble. Regular practice and performances cultural exchange events.

## Working Experience

2018.1-present Senior Research Scientist, Data61, CSIRO, Australia

- Computer vision group
- Projects: Autonomous Driving (principle investigator), Bionic Vision (member), Non-rigid 3D (member)
- 2018.2-present Senior Adjunct Lecturer, Australian National University
  - Teaching in School of Engineering and Computer Science
  - Supervising 9 Ph.D. students, 5 master students.
- 2015.9-2017.12 Research Scientist, Data61, CSIRO, Australia
  - Computer vision group
  - Projects: Autonomous Driving (principle investigator), Bionic Vision (member), Non-rigid 3D (member)
  - Tenure Position
- 2015.10-2018.1 Adjunct Lecturer, Australian National University
  - Teaching in School of Engineering and Computer Science
  - Supervising 9 Ph.D. students, 5 master students.
- 2013.2-2013.3 Visiting Staff, Multimedia and Geometry Group, Utrecht University, The Netherlands
  - Working on video enhancement
- 2013.4-2015.9 Research Assistant, Global Creative Leader Program, The University of Tokyo
  - Bayon Digital Archiving Project, Cambodia
  - Virtual Asuka-kyo project, Nara, Japan
  - 3D Preah Vehear project, Cambodia
  - Digital Archiving of 3-11 Earthquake project, Japan
  - Coordinating international and domestic research activities
  - Mentoring students
- 2010.4-2010.9 Research Student, Computer Vision Lab, The University of Tokyo
  - Research topic algebraic surface fitting
  - Digital Archiving Khufu Boat project, Egypt
  - Journal paper in Neural Computing
- 2008.1-2010.3 Research Assistant, 3D Vision Lab, Tsinghua University, China
  - Research topic: manifold learning
  - Journal paper in Pattern Recognition. Three papers published.

## Education

- 2012.10-2015.9 Ph.D. of Engineering, Computer Vision Lab. The University of Tokyo, Japan.
  - Full Scholarship (Mext, Global Creative Leader)
  - Overall GPA: 4/4 .
  - Supervisors: [Prof. Katsushi Ikeuchi](#) , [Asst. Prof. Robby T. Tan](#), [Asst. Prof. Rei Kawakami](#)
  - Topics: robust outdoor vision, rainy scenes, computational

- photometry, 3D shape modeling
- 2010.4-2012.9 Master of Engineering, Computer Vision Lab. The University of Tokyo, Japan  
- Full Scholarship (Panasonic)  
- Overall GPA: 3.93/4
- 2005.8-2009.7 Bachelor of Engineering, Department of Electrical Engineering, Tsinghua University, China.  
- Advanced Courses in Math and Physics (sub major)  
- Recommend for direct admission (free of entrance exam)  
- Overall GPA: 88.4/100 (3.71/4)
- 2002.8-2005.7 Experimental High School Attached to Beijing Normal University, China  
- National Experimental Science Program directly by The Ministry of Education. 80 students in China per year.  
- Eligible for enrollment in any university in China without exam.

## Patents

[P4] Guoxing Ma, Yu Han, Jianing Sun, Yi Zhao, Fengyu Yang, Yueqin Gu and Shaodi You, “An Automatic Surveillance System for Bracket Safety Inspection in Construction Site.” (Chinese Patent No. 201710799023.7)

[P3] A. Robles-Kelly, “Hyperspectral Image Sensor”, Australian Provisional Patent Application No 2016900098, 2016.

[P2] A System and A Method for Automatic Inspection of Protection Equipment and Operational Capability for Workers' Safety. (Chinese Patent No. 201610279988.9)

[P1] An Automatic System and Methodology for Dust Pollution Monitoring in Construction Site using Image Captured by UAV. (Chinese Patent No. 201610489505.8)

## Selected Publications (Peer reviewed)

**Journals** Impact factor are from 2016 InCites Journal Citation Report

### **Journals - Published**

[J13] Xiaofeng Han, Jianfeng Lu, Chunxia Zhao, Shaodi You and Hongdong Li, *Semi-supervised and Weakly-supervised Road Detection based on Generative Adversarial Networks*, IEEE Signal Processing Letters. Volume: 25, Issue:4, pp: 551-555. 2018. Impact factor: 2.5.

[J12] Shaodi You, Yasuyuki Matsushita, Sudipta Sinha, Yusuke Bou and Katsushi Ikeuchi. *Origami: Multi-view Rectification of Folded Documents*. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2018, Vol.40, Issue 2, pp:505-511. Impact factor: 8.3. [[pdf](#)]

[[webpage](#)]. TPAMI is the most esteemed journal in computer vision.

[J11] Xiang Wang, Huimin Ma, [Shaodi You](#) and Xiaozhi Chen, Edge Preserving and Multi-Scale Contextual Neural Network for Salient Object Detection, IEEE Trans. on Image Processing (TIP). Volume: 27, Issue:1, pp: 121-134. 2018. Impact factor: 4.8. 10.1109/TIP.2017.2756825 [[pdf](#)]

[J10] [Shaodi You](#), Robby T. Tan, Rei Kawakami, Yasuhiro Mukaigawa and Katsushi Ikeuchi. *Adherent Raindrop in Video, Modeling, Detection and Removal*. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2016. Impact factor: 8.3. [[pdf](#)] [[webpage](#)]. TPAMI is the most esteemed journal in computer vision.

[J9] [Shaodi You](#), Think Locally, Fit Globally, Robust and Fast Surface Matching via Algebraic Surface Fitting, Neurocomputing, Special Issue on Multimodal Vision, Elsevier 2016. Impact factor: 3.3, Accepted. [[pdf](#)]

[J8] [Shaodi You](#) and Huimin Ma. Manifold Topological Multi-Resolution Analysis Method. Pattern Recognition, Volume 44, Issue 8, August 2011, Pages 1629-1648. Impact factor: 4.6. [[pdf](#)]

[J6] Yu Li, [Shaodi You](#), Michael Brown and Robby T. Tan, *Visibility Enhancement in Scattering Media Survey and Benchmark*, CVIU, 2017. Impact factor: 2.5. [[pdf](#)]

[J5] Feng Lu, Lei He, [Shaodi You](#), Zhixiang Hao, Identifying Surface BRDF from a Single 4D Light Field Image via Deep Neural Network, IEEE Journal on Selected Topics in Signal Processing, Impact factor (2017): 5.3. Vol 11, Issue 7, pp 1047-1057, Doi: 10.1109/JSTSP.2017.2728001. [[pdf](#)]

[J4] Diming Zhang, Fei Xue, Hao Huang and [Shaodi You](#), VBMq: Pursuit Baremetal Performance by Embracing Block I/O Parallelism in Virtualization, Frontier of Computer Science. Accepted. Impact factor: 1.0. [[pdf](#)]

[J3] Jingjie Zhang, Yu Han, Jiayue Yao, [Shaodi You](#), Design and Implementation of Automatic Inspection System for Safety Equipment for Construction Workers, Construction Technology (in Chinese), accepted, to appear in 2018.

[J2] Guoxin Ma, Yu Han, Jianfei Lu, Jiayue Yao, [Shaodi You](#), Design and Implementation of Automatic Monitoring System for Constructional Fugitive Dust Pollution Sources Based on UAV, Environment Monitoring of China (in Chinese), Vol. 34, No. 1, pp: 151-156. 2018.

[J1] Yu Han, Jingjie Zhang, Hao Sun, Jiayue Yao, [Shaodi You](#), Design and implementation of intelligent safety inspection system for construction workers based on image recognition, Journal of Safety Science and Technology (in Chinese), Vol. 12 No. 10, pp:142 – 148.

### **Journals – under review and arXiv pre-print**

[J7] [Shaodi You](#), Ran Wei, Antonio Robles-Kelly, A Multiview Light Field Camera for Scene Depth Estimation from a Single Lens, CVIU 2017 (Major revision). Impact factor: 2.5. [[pdf](#)]

[U5] Kaiyue Lu, [Shaodi You](#), Nick Barnes, Double-Guided Filtering: Image Smoothing with Structure and Texture Guidance, Submitted to IEEE Transaction on Image Processing. Impact factor: 4.8. [[pdf](#)]

[U4] [Shaodi You](#), Robby T. Tan, Rei Kawakami, Yasuhiro Mukaigawa and Katsushi Ikeuchi, Waterdrop Stereo. Submitted to International Journal on Computer Vision, IJCV. [[pdf](#)]

[U3] [Shaodi You](#), Nick Barnes and Janine Walker, Perception Consistent Color to Gray Conversion, Submitted to International Journal on Computer Vision, IJCV.

[U2] Diming Zhang, Fei Xue, Hao Huang and [Shaodi You](#), High Performance and Scalable Virtual Machine Storage I/O Stack for Multicore Systems, submitted to Frontier of Computer

Science.

[U1] Diming Zhang, [Shaodi You](#), iFlask: Isolate Flask Security System From Dangerous Execution Environment by Using ARM TrustZone, submitted to Future Generation Computer Systems.

## Conference paper

### Conferences – Published

[C17] Junxuan Li, [Shaodi You](#), and Antonio Robles-Kelly. A Frequency Domain Neural Network for Fast Image Super-resolution, International Joint Conference on Neural Networks. IJCNN 2018. [\[pdf\]](#)

[C16] Xiang Wang, [Shaodi You](#), Huimin Ma and Xi Li, Weakly-Supervised Semantic Segmentation by Iteratively Mining Common Object Features, IEEE Computer Society Conference on Computer Vision and Pattern Recognition. CVPR 2018. [\[pdf\]](#)

[C15] Zhichen Zhao, Huimin Ma, [Shaodi You](#), Single Image Action Recognition via Sematic Part Actions, International Conference on Computer Vision, ICCV 2017. [\[pdf\]](#)[\[webpage\]](#)

[C14] Shijie Zhang, Lizhen Qu, [Shaodi You](#), Zhenglu Yang and Jiawan Zhang, Automatic Generation of Grounded Visual Questions, International Joint Conference on Artificial Intelligence, IJCAI 2017. Accept rate <25%. [\[pdf\]](#)

[C13] Kaiyue Lu, [Shaodi You](#), Nick Barnes, Double-Guided Filtering: Image Smoothing with Structure and Texture Guidance, The International Conference on Digital Image Computing: Techniques and Applications, DICTA 2017, oral presentation. [\[pdf\]](#)

[C12] David Feng, [Shaodi You](#), Nick Barnes, HOSO: Histogram Of Surface Orientation for RGB-D Salient Object Detection. The International Conference on Digital Image Computing: Techniques and Applications, DICTA 2017, oral presentation. [\[pdf\]](#)

[C11] Junxuan Li, [Shaodi You](#), Antonio Robles-Kelly, Stereo Super-resolution via a Deep Convolutional Network. The International Conference on Digital Image Computing: Techniques and Applications, DICTA 2017, oral presentation. [\[pdf\]](#)

[C10] Changkun Ye, Huimin Ma, Xiaoqin Zhang, Kai Zhang and [Shaodi You](#), Survival-Oriented Reinforcement Learning Model: An Efficient and Robust Deep Reinforcement Learning Algorithm for Autonomous Driving Problem, IAPR International Conference on Image and Graphics, ICIG2017. [\[pdf\]](#)

[C9] Bin Yue, Min Gui, Jiahui Guo, Zhenglu Yang, Jin-Mao Wei and [Shaodi You](#), An Effective Framework for Question Answering over Freebase via Reconstructing Natural Sequences. WWW 2017.

[C8] Kunming Li, Yu Li, [Shaodi You](#) and Nick Barnes, Photo-Realistic Simulation of Road Scene for Data-Driven Methods in Bad Weather, ICCV Workshop on Physics Based Vision meets Deep Learning, 2017. [\[pdf\]](#)

[C7] Riku Shigematsu, David Feng, [Shaodi You](#) and Nick Barnes, Learning RGB-D Salient Object Detection using background enclosure, depth contrast, and top-down features, ICCV Workshop on Mutual Benefit of Cognitive and Computer Vision, 2017. [\[pdf\]](#)

[C6] David Feng, [Shaodi You](#) and Nick Barnes, DSD: Depth Surface Descriptor for Structural Edge Detection, ICCV Workshop on Assistive Computer Vision and Robotics, 2017. [\[pdf\]](#)

[C5] David Feng, Nick Barnes, [Shaodi You](#) and Chris McCarthy. *Local Background Enclosure for RGB-D Salient Object Detection*. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2016, Spotlight Presentation). Accept rate <10%. [\[pdf\]](#). CVPR is the highest impact conference in computer vision, and top 20 highest impact conference in

engineering.

[C4] [Shaodi You](#), Robby T. Tan, Rei Kawakami, Yasuhiro Mukaigawa and Katsushi Ikeuchi. *Raindrop Detection and Removal from Long Range Trajectory*. 12th Asian Conference on Computer Vision (ACCV 2014 Oral presentation), Nov. 3-5, 2014, Singapore. Accept rate < 5%. [\[pdf\]](#) [\[webpage\]](#)

[C3] [Shaodi You](#), Robby T. Tan, Rei Kawakami and Katsushi Ikeuchi. *Adherent Raindrop Detection and Removal in Video*. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2013), June 25-27, 2013, Portland, Oregon, USA. Accept rate < 25%. - [\[pdf\]](#) [\[webpage\]](#). CVPR is the highest impact conference in computer vision, and top 20 highest impact conference in engineering.

[C2] [Shaodi You](#), Robby T. Tan, Rei Kawakami and Katsushi Ikeuchi. *Robust and Fast Motion Estimation for Video Completion*. IAPR Machine Vision Applications (MVA 2013 Oral), May 20-23, 2013, Kyoto, Japan. Accept rate < 7%. [\[pdf\]](#)

[C1] Xiao Yu, Huimin Ma, [Shaodi You](#) and Ze Yuan. A solution for efficient viewpoint space partition in 3D object recognition. International Conference on Image and Graphic 2009 (ICIG2009 Oral), Xi'an, China. Accept rate < 7%. [\[pdf\]](#)

### **Conference - Under Review and arXiv pre-print:**

[U14] David Feng, [Shaodi You](#) and Nick Barnes, Top-down Bottom-up Supervision Enhancement for Edge Detection, Submitted to CVPR 2018.

[U13] Xiang Wang, Huimin Ma, [Shaodi You](#), Deep Clustering for Weakly-Supervised Semantic Segmentation in Complex Object-Clustered Scenes, Submitted to ECCV 2018.

[U12] Ziang Cheng, [Shaodi You](#), Viorela Ila and Hongdong Li, Semantic Single-Image Dehazing, Submitted to ECCV 2018.

[U11] Kaiyue Lu, [Shaodi You](#) and Nick Barnes, Deep Image Smoothing based on Texture and Structure Guidance. Submitted to ECCV 2018

[U9] Ryota Yoshihashi, Tinh Tuan, Rei Kawakami, [Shaodi You](#), Makoto Iida and Takeshi Naemura, Differentiating Objects by Motion: Joint Detection and Tracking of Small Flying Objects, [\[pdf\]](#)

[U8] Weixuan Sun, [Shaodi You](#), Janine Walker, Kunming Li and Nick Barnes, Salient Structure: Validation through Eye-tracking and a Benchmark for Salient Structure Detection, Submitted to ICIP 2018. [\[pdf\]](#)

[U7] [Shaodi You](#) and Nick Barnes, Water Splash Suppression in A Single Image, Submitted to International Conference on Computer Vision. [\[pdf\]](#)

## **Thesis**

[T3] [Shaodi You](#). *Detection and Removal of Raindrop Images in A Video Sequence and Their Applications to Computer Vision Algorithms*. Doctoral Thesis, The University of Tokyo, 2015. [\[pdf\]](#)

[T2] [Shaodi You](#), *Adherent Raindrop Detection and Removal in Video*, Master Thesis, The University of Tokyo, 2013. [\[pdf\]](#)

[T1] [Shaodi You](#), *Manifold Multi-Resolution Analysis Method using Spectral Embedding Theory*, Bachelor Thesis, Tsinghua University, 2009. Best Thesis Award (Rank 1/90) [\[pdf\]](#).



## Awards and Honors

- 2017.11 Best Paper Award. David Feng, Nick Barnes, Shaodi You: HOSO: Histogram Of Surface Orientation for RGB-D Salient Object Detection. The International Conference on Digital Image Computing: Techniques and Applications, DICTA 2017
- 2017.9 Digital, National Facilities & Collections Awards 2017  
Science Excellence : Vision processing for the Bionic Eye.
- 2017.5 iAWARDS 2017, Research and Development Project of the Year:  
Vision Processing for Bionic Eye. Australian Capital Territory.  
Australian Information Industry Association
- 2017.5 iAWARDS 2017, Consumer Markets:  
Vision Processing for Bionic Eye. Australian Capital Territory.  
Australian Information Industry Association
- 2013.4 - 2015.9 Japanese Government (Monbunkagakusho: MEXT) Scholarship  
- University referenced (Rank 1 among applicants)  
- Allowance 5,328,000 JPY (49,000 USD)  
- Full tuition fee coverage  
- Research funding 3,000,000 JPY (27,000 USD)
- 2013.4 -2016.3 SCAT Scholarship  
- Allowance 3,600,000 JPY (33,000 USD).
- 2013.4 -2014.3 SEUT Doctoral Student Special Incentives Program  
- Allowance 1,800,000 JPY (16,000 AUD).
- 2010.4 -2013.3 Panasonic Scholarship  
- Allowance 6,120,000 JPY (56,000 AUD) Granted  
- Full tuition fee coverage  
- Six grants in China per year
- 2009.7 Best Thesis, Tsinghua University  
- Rank 1 / 90
- 2008.10 Scholarship for Academic Excellence(Class III), Tsinghua University
- 2006.12 Scholarship for Academic Excellence(Class II), Tsinghua University
- 2005.6 Honorable mention in 2004/2005 "First Step to Nobel Prize in Physics",  
Polish Academy of Science. Research Paper: Why are some mirage  
inverted.
- 2004.9 First Prize, Chinese Physics Olympic Contest (province-wide)  
- Eligibility for direct college admission without national standard  
exam.
- 2004.9 Second Prize, Chinese Chemistry Olympic Contest (province -wide)  
- Eligibility for direct college admission without national standard  
exam.
- 2004.5 First Prize, Chinese Biology Olympic Contest (province-wide)  
- Eligibility for direct college admission without national standard

2003.9 exam.  
Second Prize, Chinese Mathematics Olympic Contest (province-wide)  
- Eligibility for direct college admission without national standard exam.

## Skills

Languages Chinese(native),  
English(proficient), IELTS(S:7, L:8, R:8, W:7),  
Japanese(proficient), JLPT: N1.

Programming Matlab, C++/C, Tensor flow (Deep learning), MatConvNet (Deep learning), Verilog HDL (Hardware language), VHDL (Hardware language), MIPS assembly, x86 assembly.