


## EDUCATION

- **Australian National University.** September 2015 - To date.  
Ph.D. in Engineering and Computer Science.  
Thesis: Non-Rigid Structure from Motion.  
Supervisory Panel: Yuchao Dai, Hongdong Li, Richard Hartley.
- **IIIT-Hyderabad.** July 2013.  
M.S. in Computer Science and Engineering.  
Research Area: Robotic Vision.  
Supervisor: K Madhava Krishna.

## AWARDS AND ACHIEVEMENTS

- Awarded ANU Vice-Chancellor Grant.
- **Winner** of NRSfM Challenge at CVPR 2017, Prize awarded by Disney Research.
- Student funding to attend ICML 2017, Sydney Australia and ICCV 2017, Venice Italy.
- Student funding to attend Robot Vision Summer School 2016, Kiola, Australia.
- Recipient of "Australian National University Higher Degree Research" Merit Scholarship Award.
- Recipient of "Best Innovative Group 2014", by Uurmi Systems Private Limited, India.
- Fully funded by Campus France to do research at INRIA, Grenoble-France.
- Full-Time Scholarship Student for MS program at IIIT-Hyderabad, India.
- Winner of "8085 Programming" and "Project Demonstration" contest at TITIKSHA 2008.

## PUBLICATIONS

- [1] Suryansh Kumar  
*Non-rigid Structure from Motion: Prior-Free Factorization Method Revisited.*  
ArXiv Preprint 2019. (Under Review)
- [2] Suryansh Kumar, Ram Srivatsav Ghorakavi, Yuchao Dai, Hongdong Li.  
*Dense Depth Estimation in Complex Dynamic Scene without Explicit 3D Motion Estimation.*  
ArXiv Preprint 2019. (Under Review)
- [3] Suryansh Kumar, Yuchao Dai, Hongdong Li.  
*Superpixel Soup: Monocular Dense 3D Reconstruction of a Complex Dynamic Scene.*  
Transactions on Pattern and Machine Intelligence (**T-PAMI**), IEEE, 2019 (Under Review).
- [4] Suryansh Kumar  
*Jumping Manifolds: Geometry Aware Dense Non-Rigid Structure from Motion.*  
Conference on Computer Vision and Pattern Recognition (**CVPR**), IEEE, 2019, CA, USA.
- [5] Suryansh Kumar, Anoop Cherian, Yuchao Dai, Hongdong Li.  
*Scalable Dense Non-rigid Structure from Motion: A Grassmannian Perspective.*  
Conference on Computer Vision and Pattern Recognition (**CVPR**), IEEE, 2018, Utah, USA.
- [6] Suryansh Kumar, Yuchao Dai, Hongdong Li.  
*Monocular Dense 3D Reconstruction of a Complex Dynamic Scene from Two Perspective Images.*  
International Conference on Computer Vision (**ICCV**), IEEE, 2017, Venice, Italy.  
\* Discussed at **IEEE Communication Society** MMT Communications-Review Vol. 9, No.2, April 2018.  
\* Presented at **CMU RI** November 2017 by Prof. Hongdong Li.
- [7] Suryansh Kumar, Yuchao Dai, Hongdong Li.  
*Spatio-Temporal Union of Subspaces for Multi-body Non-rigid Structure-from-Motion.*  
Pattern Recognition Journal (**PR**), Elsevier, 2017.  
\* Received **Best Algorithm** Award in NRSfM Challenge at (**CVPR**) 2017 by  Disney Research.

- [8] Suryansh Kumar, Yuchao Dai, Hongdong Li.  
*Multi-body Non-rigid Structure from Motion.*  
International Conference on 3D Vision (**3DV**), IEEE, 2016, Stanford University, USA.
- [9] Suryansh Kumar, Siva Karthik M, K. Madhava Krishna.  
*Markov Random Field based Small Obstacle discovery over Images.*  
International Conference on Robotics and Automation (**ICRA**), IEEE, 2014, Hong Kong, China.
- [10] Suryansh Kumar, Ayush Dewan, K. Madhava Krishna.  
*A Bayes filter based adaptive floor segmentation with homography and appearance cues.*  
(**ICVGIP**), ACM, 2012, IIT-Bombay, India. (**Oral Presentation**)
- [11] Sarthak Upadhyay, Suryansh Kumar, K. Madhava Krishna.  
*CRF Based Frontier Detection using Monocular Camera.*  
(**ICVGIP**), ACM, 2014, IISc Bangalore, India. (**Oral Presentation**)
- [12] Sudhanshu Mittal, Siva Karthik M, Suryansh Kumar, K. Madhava Krishna.  
*Small object discovery and recognition using actively guided robot.*  
International Conference on Pattern Recognition (**ICPR**), IEEE, 2014, Stockholm, Sweden.

## RESEARCH INTERESTS

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- *Computer Vision*: 3D Reconstruction, Depth Estimation and Motion Segmentation.
- *Robotic Vision*: Camera Calibration, SLAM and Visual SLAM.
- *Mathematics*: Mathematical Optimisation, Compressed Sensing, Topological Manifolds.
- *Machine Learning*: Deep Learning, Support Vector Machine, Probabilistic Graphical Models.
- *Others*: Discrete Differential Geometry.

## PROFESSIONAL SERVICE

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- *Technical Program Committee Member*: ACM MM 2019.
- *Reviewer*: T-PAMI, CVPR, ICCV, ICRA, 3DV, IEEE C.I Magazine, Pattern Recognition.
- *TA, Computer Vision Course.* (ENGN4528/6528) Feb. 2018 - July 2018.  
Course Instructor: Hongdong Li.
- *TA, Individual Engineering Project Course.* (ENGN4200) Feb. 2017 - July 2017.  
Course Instructor: Yuchao Dai.
- *TA, Computer Vision Course.* (ENGN4528/6528) Feb. 2017 - July 2017.  
Course Instructor: Jonghyuk Kim.
- *Consultant-Engineer, Algorithm Developer.* July 2014 - July 2015.  
Company: Uurmi Systems, Hyderabad, India.

## RESEARCH EXPERIENCE

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- **INRIA, e-Motion, Grenoble-France.** Sept. 2013 - Feb. 2014.  
Visiting Scientist.  
Topic: Autonomous Driving  
Advisors: Dizan Vasquez, Christian Laugier.
- **IIT-Hyderabad, India.** Jan. 2011 - Aug. 2013.  
Research Assistant.  
Topic: Robot Vision  
Supervisor: K Madhava Krishna.
- **IIT-Hyderabad, India.** Aug. 2010 - Dec. 2010.  
Project Associate.  
Topic: Pervasive Sensor Networks  
Supervisor: P. Rajalakshmi.

## ONLINE COURSE CERTIFICATION

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- *Machine Learning*  
Coursera, License No: FBXH2KPEU44M, Course Instructor: Andrew Ng.
- *Neural Networks and Deep Learning*  
Coursera, License No: UJWL63E4KPB2, Course Instructor: Andrew Ng.
- *Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization*  
Coursera, License No: PDVY9DCXEA7H, Course Instructor: Andrew Ng.

## TECHNICAL SKILL SET

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- *Programming Language*: C/C++, Python.
- *Scripting Language*: Matlab, Octave, Unix Shell Programming.
- *Libraries and APIs*: OpenCV, OpenGL, ROS, Eigen, STL, Numpy, Scipy, Pangolin.
- *Deep Neural Network Frameworks*: PyTorch, TensorFlow.
- *Web and Documentation*: HTML, CSS,  $\text{\LaTeX}$ .
- *Others*: Embedded C, Unix System Programming.

## LANGUAGES

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English, Hindi.

**References are available on request**