

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.
- [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

- *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

- *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

- **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

- *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

- *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, \LaTeX .
- *Others*: Embedded C, Unix System Programming.

LANGUAGES

English, Hindi.

References are available on request