

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.

WORK EXPERIENCE

- **Google New York, USA.** May 2019 - Till Date.
Topic: Geometric Learning
Host: Ameesh Makadia.
- **Uurmi Systems, Hyderabad, India.** July 2014 - June 2015.
Consultant Engineer.
Position: Computer Vision Algorithm Developer
Supervisor: Venkatesh Bala Subburaman, Shanti Swarup Medasani
- **INRIA, e-Motion, Grenoble-France.** Sept. 2013 - Feb. 2014.
Visiting Scientist.
Topic: Autonomous Driving
Advisors: Dizan Vasquez, Christian Laugier.
- **IIIT-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.

ACADEMIC 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.

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.
★ Conferred at IEEE Comm. Society MMTCC Communications-Review Vol. 9, No.2, April 2018.
★ Presented at CMU RI VASC Seminar on 20th 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

- **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.

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, L^AT_EX.
- **Others:** Embedded C, Unix System Programming.

LANGUAGES

English, Hindi.

- References are available on request