

EMPLOYMENT

- **ETH Zürich, Switzerland.** Nov. 2019 - Till Date.
Position: Professorship for Computer Vision.
Funded by: ETH Zürich Foundation and Google for 3D vision projects.
Advised and Directed by: Luc Van Gool.
Advisor at Google: Vittorio Ferrari, Cristian Sminchisescu.
- **Google New York, USA.** May 2019 - Aug. 2019.
Topic: Geometric Learning
- **Uurmi Systems, Hyderabad, India.** July 2014 - June 2015.
Consultant Engineer.
Position: Computer Vision Algorithm Developer
- **INRIA, e-Motion, Grenoble-France.** Sept. 2013 - Feb. 2014.
Visiting Scientist.
Topic: Autonomous Driving
- **IIIT-Hyderabad, India.** Jan. 2011 - Aug. 2013.
Research Assistant.
Topic: Robot Vision
- **IIT-Hyderabad, India.** Aug. 2010 - Dec. 2010.
Project Associate.
Topic: Pervasive Sensor Networks

EDUCATION

- **Australian National University.** Sept. 2015 - July 2019.
Ph.D. in Engineering and Computer Science.
Thesis: Non-Rigid Structure from Motion.
Supervisory Panel: Yuchao Dai, Hongdong Li, Richard Hartley.
★ Nominated for J. G. Crawford Prize at ANU for Best Ph.D. Thesis 2019.
★ Winner of Non-Rigid Structure from Motion Challenge, Awarded by Disney Research.
★ Recipient of HDR Merit Scholarship. (Highly competitive scholarship at ANU)
- **IIIT-Hyderabad.** July 2013.
M.S. in Computer Science and Engineering.
Research Area: Robotic Vision.
Scholarship Student.

AWARDS AND ACHIEVEMENTS

- Nominated for J. G. Crawford Prize for Best Ph.D. Thesis 2019 at Australian National University.
- Awarded Australian National University 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] [Non-rigid Structure from Motion.](#)
Suryansh Kumar.
Ph.D. Thesis, Australian National University.
★ *Nominated for J. G. Crawford Prize for Best Ph.D. Thesis (Interdisciplinary).*
- [2] [Non-rigid Structure from Motion: Prior-Free Factorization Method Revisited.](#)
Suryansh Kumar.
Winter Conference on Applications of Computer Vision (WACV), IEEE, 2020, Colorado, USA.
★ *Oral Presentation.*
- [3] [Jumping Manifolds: Geometry Aware Dense Non-Rigid Structure from Motion.](#)
Suryansh Kumar.
Conference on Computer Vision and Pattern Recognition (CVPR), IEEE, 2019, CA, USA.
★ *Also invited for oral presentation at Dynavis CVPR 2019.*
- [4] [Superpixel Soup: Monocular Dense 3D Reconstruction of a Complex Dynamic Scene.](#)
Suryansh Kumar, Yuchao Dai, Hongdong Li.
Transactions on Pattern and Machine Intelligence (T-PAMI), IEEE, 2019.
- [5] [Scalable Dense Non-rigid Structure from Motion: A Grassmannian Perspective.](#)
Suryansh Kumar, Anoop Cherian, Yuchao Dai, Hongdong Li.
Conference on Computer Vision and Pattern Recognition (CVPR), IEEE, 2018, Utah, USA.
- [6] [Monocular Dense 3D Reconstruction of a Complex Dynamic Scene from Two Perspective Images.](#)
Suryansh Kumar, Yuchao Dai, Hongdong Li.
International Conference on Computer Vision (ICCV), IEEE, 2017, Venice, Italy.
★ *Conferred at IEEE Comm. Society MMTC Communications-Review Vol. 9, No.2, April 2018.*
★ *Presented at CMU RI VASC Seminar on 20th November 2017 by Prof. Hongdong Li.*
- [7] [Spatio-Temporal Union of Subspaces for Multi-body Non-rigid Structure-from-Motion.](#)
Suryansh Kumar, Yuchao Dai, Hongdong Li.
Pattern Recognition Journal (PR), Elsevier, 2017.
★ *Received Best Algorithm Award in NRSFM Challenge at (CVPR) 2017 by  Disney Research.*
- [8] [Multi-body Non-rigid Structure from Motion.](#)
Suryansh Kumar, Yuchao Dai, Hongdong Li.
International Conference on 3D Vision (3DV), IEEE, 2016, Stanford University, USA.
- [9] [Markov Random Field based Small Obstacle discovery over Images.](#)
Suryansh Kumar, Siva Karthik M, K. Madhava Krishna.
International Conference on Robotics and Automation (ICRA), IEEE, 2014, Hong Kong, China.
- [10] [A Bayes filter based adaptive floor segmentation with homography and appearance cues.](#)
Suryansh Kumar, Ayush Dewan, K. Madhava Krishna.
(ICVGIP), ACM, 2012, IIT-Bombay, India. (**Oral Presentation**)
- [11] [CRF Based Frontier Detection using Monocular Camera.](#)
Sarathak Upadhyay, Suryansh Kumar, K. Madhava Krishna.
(ICVGIP), ACM, 2014, IISc Bangalore, India. (**Oral Presentation**)
- [12] [Small object discovery and recognition using actively guided robot.](#)
Sudhanshu Mittal, Siva Karthik M, Suryansh Kumar, K. Madhava Krishna.
International Conference on Pattern Recognition (ICPR), IEEE, 2014, Stockholm, Sweden.
- Under Preparation**
- [13] [Dense Non-Rigid Structure from Motion: A Manifold Viewpoint](#)
Suryansh Kumar, Luc Van Gool, Carlos Oliveira, Anoop Cherian, Yuchao Dai, Hongdong Li.
arXiv Preprint 2020. (Under Progress)

- [14] [Dense Depth Estimation of a Complex Dynamic Scene without Explicit 3D Motion Estimation.](#)
Suryansh Kumar, Ram Srivatsav Ghorakavi, Yuchao Dai, Hongdong Li, Luc Van Gool.
arXiv Preprint 2019. (Under Progress)

RECENT TALK

- ETH Zürich “Non-Rigid Structure-from-Motion.” Dec. 2019.
Host: Computer Vision Lab, D-ITET, ETH Zürich.
- Dynavis CVPR 2019, “Jumping Manifold.” June 2019.
Host: Armin Mustafa, Marco Volino, Michael Zollhöfer, Dan Casas, Adrian Hilton.
- Australian National University, “Non-Rigid Structure from Motion.” March 2019.
Host: Hongdong Li, Yuchao Dai.
- Samsung Research America, “Dynamic Scene 3D Reconstruction.” Jan. 2019.
Host: Shalini Ghosh.

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.

STUDENTS AND COLLABORATORS

- **Current Students:**
 - Berk Kaya (Ph.D) (Nov. 2019 -)
 - Erik Sandström (Ph.D) (Nov. 2019 -)
 - Yan Wu (M.S) (July 2020 -)
 - Serafino Samuele (M.S) (Aug. 2020 -)
 - Sarno Francesco (M.S) (Aug. 2020 -)
 - Sukthanker Rhea (M.S) (Aug. 2020 -)
- **Past Students:**
 - Sukthanker Rhea (M.S) (March 2020 - June 2020)
 - Erik Endsjo Goron (M.S) (March 2020 - June 2020)
- **Collaborators:**
 - Anton Obukhov (Topic: Tensor Factorization.)
 - Zhiwu Huang (Topic: Application of Non-Euclidean Geometry Learning for Videos.)
 - Martin R. Oswald (Topic: Dense depth estimation and 3D Reconstruction)

RESEARCH INTERESTS

- **Computer Vision:** Structure from Motion, Photometric Stereo, Multiview Stereo.
- **Robotics :** State Estimation, Camera Calibration, Visual SLAM.
- **Mathematics:** Mathematical Optimisation, Compressed Sensing, Topological Manifolds.
- **Machine Learning:** Neural Architecture Search, Graph Neural Networks.
- **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 Framework:** PyTorch.
- **Web and Documentation:** HTML, CSS, L^AT_EX.
- **Others:** Embedded C, Unix System Programming.

LANGUAGES

English, Hindi.