

## EMPLOYMENT

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- **ETH Zürich, Switzerland.** [Nov. 2019 - To date.]  
 Professorship for Computer Vision  
 Funded by: ETH Zürich Foundation.  
 Advised and Directed by: Luc Van Gool.  
 Advisor at [Google](#): Vittorio Ferrari.  
 [\*Declined PostDoc offer by University of Oxford.]
- **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
- **IIT-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

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- **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 Interdisciplinary 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)*
- **IIT-Hyderabad.** July 2013.  
 M.S. in Computer Science and Engineering.  
 Research Area: Robot Vision.  
 Scholarship Student.

## AWARDS AND ACHIEVEMENTS

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- Nominated for J. G. Crawford Prize for Best Interdisciplinary Ph.D. Thesis 2019 at ANU.
- 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 IIT-Hyderabad, India.
- Winner of “8085 Programming” and “Project Demonstration” contest at TITIKSHA 2008.

## PUBLICATIONS

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### Conference Proceedings

- [1] [Uncalibrated Neural Inverse Rendering for Photometric Stereo of General Surfaces.](#)  
Berk Kaya, Suryansh Kumar, Carlos Oliveira, Vittorio Ferrari, Luc Van Gool.  
Conference on Computer Vision and Pattern Recognition (CVPR), IEEE, 2021, Tennessee, USA.
- [2] [Neural Architecture Search of SPD Manifold Networks.](#)  
Rhea Sukthanker, Zhiwu Huang, Suryansh Kumar, Erik G. Endsjo, Yan Wu, Luc Van Gool.  
International Joint Conference on Artificial Intelligence (IJCAI), 2021, Montreal, Canada.
- [3] [Non-rigid Structure from Motion: Prior-Free Factorization Method Revisited.](#)  
Suryansh Kumar.  
Winter Conference on Applications of Computer Vision (WACV), IEEE, 2020, Colorado, USA.
- [4] [Jumping Manifolds: Geometry Aware Dense Non-Rigid Structure from Motion.](#)  
Suryansh Kumar.  
Conference on Computer Vision and Pattern Recognition (CVPR), IEEE, 2019, California, USA.
- [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.
- [7] [Multi-body Non-rigid Structure from Motion.](#)  
Suryansh Kumar, Yuchao Dai, Hongdong Li.  
International Conference on 3D Vision (3DV), IEEE, 2016, Stanford University, USA.
- [8] [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.
- [9] [CRF Based Frontier Detection using Monocular Camera.](#)  
Sarthak Upadhyay, Suryansh Kumar, K. Madhava Krishna.  
(ICVGIP), ACM, 2014, IISc Bangalore, India. **(Oral Presentation)**
- [10] [An open framework for human-like autonomous driving using Inverse Reinforcement Learning.](#)  
Dizan Vasquez, Yufeng Yu, Suryansh Kumar, Christian Laugier.  
Vehicle Power and Propulsion Conference (VPPC), IEEE, 2014, Coimbra, Portugal.
- [11] [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.
- [12] [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)**

### Journals and Thesis

- [1] [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.
- [2] [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.

- [3] [Non-rigid Structure from Motion.](#)  
Suryansh Kumar.  
Ph.D. Thesis, Australian National University.

### Preprints and Technical Report

- [1] [Generative Flows with Invertible Attentions.](#)  
Rhea Sukthanker, Zhiwu Huang, Suryansh Kumar, Radu Timofte, Luc Van Gool.  
arXiv Preprint 2021.
- [2] [Trilevel Neural Architecture Search for Efficient Single Image Super-Resolution.](#)  
Yan Wu, Zhiwu Huang, Suryansh Kumar, Rhea Sukthanker, Radu Timofte, Luc Van Gool.  
arXiv Preprint 2021.
- [3] [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.
- [4] [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.

## RECENT TALK

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- 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.” Mar. 2019.  
Host: Hongdong Li, Yuchao Dai.
- Samsung Research America, “Dynamic Scene 3D Reconstruction.” Jan. 2019.  
Host: Shalini Ghosh.

## SERVICE AND PROFESSIONAL ACTIVITIES

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- **Journal Reviewer:** T-PAMI, IJCV, Pattern Recognition, AURO.
- **Conference Reviewer:** ICLR, CVPR, ECCV, ICRA, IROS, 3DV, ICCV.
- **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

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- **Current Students.**
  - Noah Rothenberger [Sept. 21 -]
  - Guohao Li (KAUST visiting researcher) [May. 21 -]
  - Sarno Francesco (Intern) [May. 20 -]
  - Jiahao Wang (M.S) [May. 21 -]
  - Soomin Lee (M.S) [May. 21 -]
  - Berk Kaya (Ph.D) [Nov. 19 -]
  - Erik Sandström (Ph.D) [Nov. 19 -]

- **Past Students.**
  - Valentin Ibars (M.S) [Feb. 21 - Jun. 21]
  - Sukthanker Rhea (M.S) [Oct. 20 - May. 21]
  - Sarno Francesco (M.S) [Oct. 20 - Mar. 21]
  - Menini Davide (M.S) [Oct. 20 - Mar. 21]
  - Serafino Samuele (M.S) [Sep. 20 - Nov. 20]
  - Yan Wu (M.S) [Aug. 20 - Oct. 20]
  - Sukthanker Rhea (M.S) [Mar. 20 - Jun. 20]
  - Erik Endsjo Goron (M.S) [Mar. 20 - Jun. 20]
- **Collaborators.**
  - Fisher Yu [Topic: Visual Intelligence and Robotic Arm.]
  - Radu Timofte [Topic: Deep-Learning for Image and Video Enhancement.]
  - Zhiwu Huang [Topic: Deep-Learning for Image and Video Enhancement.]
  - Alex Liniger [Topic: Mobile Robotics Intelligence.]
- **External Informal Collaborators.**
  - Yang Xiao, Dept. of Mathematics ETH.
  - Nishant Jain, CSE IIT-Roorkee.

## RESEARCH INTERESTS

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- **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

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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 Framework:** PyTorch.
- **Web and Documentation:** HTML, CSS, L<sup>A</sup>T<sub>E</sub>X.
- **Others:** Embedded C, Unix System Programming.

## LANGUAGES

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English, Hindi.