SUNDARA TEJASWI DIGUMARTI

Postdoctoral Researcher, Dynamic Robot Systems Group, Oxford Robotics Institute,
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Education

PhD. in Robotics (2020)
Semantic Segmentation and Mapping in Natural Environments — ETH Zürich, Switzerland
Supervisors: Prof. Roland Siegwart, Dr. Paul Beardsley — Disney Research

MSc. in Robotics, Systems and Control (2012 -2014)
Re-acquisition of People using Clothing Characterization — ETH Zürich, Switzerland
Supervisors: Prof. Roland Siegwart, Dr. Paul Beardsley — Disney Research

B.Tech in Electrical Engineering (2008 - 2012)
Development of a Smart Wheelchair — IIT Jodhpur, India
Supervisor: Dr. Swagat Kumar

Work Experience

Postdoctoral Researcher – September 2021 – present
Developing techniques to use semantics and structure to segment 3D navigation maps, extract meaning and enable long term scene understanding.
Supervisor: Dr. Maurice Fallon — Oxford Robotics Institute, University of Oxford, UK

Postdoctoral Research Associate – August 2019 – August 2021
Developed learning-based techniques for understanding imagery from novel cameras, semantics of natural structures.
Supervisor: Prof. Ian Manchester — ACFR, University of Sydney, Australia

Research Intern - Winter 2013
Developed and implemented gesture-based control for a service robot. Supervisor: Dr. Swagat Kumar — TCS Innovation Labs, India

Semester Thesis – Fall 2013
Developed and implemented a rendezvous algorithm for the Distributed Flight Array. Supervisor: Prof. Raffaello d'Andrea — IDSC, ETH Zürich, Switzerland

Research Intern - Summer 2011
Benchmarked classification techniques on the Opportunity - Human Activity dataset. Supervisor: Prof. José del R. Millán — CNBI, EPFL, Switzerland

Skills

Programming	C/C++, Python, ROS, Matlab, CUDA, AVR, Arduino
Deep Learning	Tensorflow, PyTorch, Keras
Creative Design	Blender, Illustrator, Photoshop, Krita
CAD	OnShape, Autodesk Fusion 360
Circuit Design	KiCAD
Workshop Skills	3D Printing, Laser Cutting, Soldering, Welding, Casting, Turning

Publications

1. **S.T. Digumarti**, J. Daniel, A. Ravendran and D. G. Dansereau,
   Unsupervised Learning of Depth Estimation and Visual Odometry for Sparse Light Field Cameras.
   IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021
2. D. Ren, X. Ren, X. Wang, **S. T. Digumarti** and G. Shi,
   Fast-learning Grasping and Pre-grasping via Clutter Quantization and Q-map Masking.
   IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021
3. **S. T. Digumarti**, L. M. Schmid, G. M. Rizzi, J. Nieto, R. Siegwart, P. Beardsley and C. Cadena,
   An approach for semantic segmentation of tree-like vegetation.
   IEEE International Conference on Robotics and Automation (ICRA), 2019
4. **S. T. Digumarti**, J. Nieto, C. Cadena, R. Siegwart and P. Beardsley,
   Automatic segmentation of tree structure from point cloud data.
   IEEE Robotics and Automation Letters (RAL), 2018
5. **S. T. Digumarti**, G. Chaurasia, A. Taneja, R. Siegwart, A. Thomas and P. Beardsley,
   Underwater 3D capture using a low-cost commercial depth camera.
   IEEE Winter Conference on Applications of Computer Vision (WACV), 2016
6. **S.T. Digumarti**, J. Alonso-Mora, R. Siegwart, and P. Beardsley,
   Pixelbots 2014. In Association for Computing Machinery (ACM) SIGGRAPH '16 Art Gallery, 2016.
7. M. Kriegleder, **S. T. Digumarti**, R. Oung, R. d'Andrea,
   Rendezvous with bearing-only information and limited sensing range.
   IEEE International Conference on Robotics and Automation (ICRA), 2015
8. R. Chavarriaga, H. Sagha, A. Calatroni, **S. T. Digumarti**, G. Tröster, J. D. R. Millán, D. Roggen,
   The Opportunity challenge: A benchmark database for on-body sensor-based activity recognition.
   Pattern Recognition Letters, 34(15), 2013
9. A. Trivedi, A. Singh, **S. T. Digumarti**, D. Fulwani, S. Kumar,
   Design and implementation of a smart wheelchair.
   Advances in Robotics, International Conference of Robotics Society of India, 2013
10. H. Sagha, **S. T. Digumarti**, J. D. R. Millán, A. Calatroni, D. Roggen, G. Tröster, D. Bannach, P. Lukowicz, A. Ferscha, R. Chavarriaga,
    Workshop on robust machine learning techniques for human activity recognition: Activity recognition challenge.
    IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2011
11. H. Sagha, **S. T. Digumarti**, J. D. R. Millán, R. Chavarriaga, A. Calatroni, D. Roggen, G. Tröster,
    Benchmarking classification techniques using the Opportunity human activity dataset.
    IEEE International Conference on Systems, Man, and Cybernetics, 2011

Awards and Achievements

1. Best Paper Award at Advances in Robotics, Pune, India, 2013
2. Cleared the 1st round of Bristol's Basecamp Enterprise competition, 2018-19
3. ETH Scholarship for Masters' Students, 2013-2014
4. Won gold at national level Shotokan Karate competition, 2005

Teaching

1. Part-time lecturer, Introduction to Mechatronics (USyd MTRX1702), 2019, 2020
   Delivered lectures on programming concepts in C.
   Designed questions and evaluated final exams.
2. Part-time lecturer, Experimental Robotics (USyd MTRX5700), 2020, 2021, 2022
   Delivered lectures on computer vision and deep learning for robotics.
   Developed a ROS based simulation framework to facilitate online learning.
   Designed assignments and final exam questions. Evaluated projects and exams.
3. Co-coordinator and part-time lecturer, Experimental Robotics (USyd MTRX8700), 2021
   Organize the course and content. Lecturing for the module on deep learning for robotics.
4. Co-organizer and part-time lecturer, SIRIS PhD course: Foundations of Robotics Research, 2020
   Delivered a lecture on deep learning for robotics.
5. Instructor, Oxford Prospects and Global Development Institute: AI and Robotics, 2021, 2022
   Delivered a series of 7 lectures on robot kinematics, computer vision and deep learning.

Mentorship

1. Team captain and academic mentor, USyd team for IROS Open Cloud Robotics Table Organization Challenge (OCRTOC), 2020
2. Mentor, USyd team for the Heineken zero-contact robot bar project, 2020
3. Co-supervisor for Bachelors' theses and summer internships at USyd (5 projects), 2019-2020
4. Co-supervisor for Masters' and Bachelors' theses at ETH (10 projects), 2016-2019
5. Mentor and co-supervisor, ETH Fokus Project, *Scubo*, an undergraduate project for the development of an omnidirectional underwater robot (8 students), 2015-2016
6. Co-founder and Mentor, amateur robotics and electronics clubs of IIT Jodhpur, 2008-2012
7. Coordinator, student counselling services of IIT Jodhpur, 2009-2012

Community and Outreach

1. Co-organized ICRA Workshop on Sensing, Estimating and Understanding the Dynamic World, 2020
2. Organized conference-based paper discussion sessions at SIRIS/ACFR, 2020
3. Helped organize talks for a seminar series at SIRIS/ACFR, 2020
4. Paper reviewer:
   a. IEEE Transactions on Robotics (T-RO), 2021, 2022
   b. IEEE International Conference on Robotics and Automation (ICRA), 2019 - 2022
   c. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018 - 2021
   d. IEEE Robotics and Automation Letters (RAL), 2018, 2019, 2020, 2021, 2022
5. Volunteer, Conference on Robot Learning (CoRL), 2018
6. Volunteer, Eurographics, 2015
7. Member IEEE, Robotics and Automation Society (RAS)

Languages

Fluent in English, Telugu and Hindi. German (B1), French (A1), Sanskrit (Pravesa)

Hobbies

Painting Sculpting Table-tennis Hiking Cooking Video games