SUNDARA TEJASWI DIGUMARTI

Visual SLAM R&D Engineer, Arrival, UK

Website: https://tejaswid.github.io

Email: sundaratejaswi@gmail.com, tejaswid@oxfordrobotics.institute

Address: Flat 4 Wellington Court, 53 Chivalry Road, London SW11 1HX, UK.

Research Areas

Perception and deep learning – panoptic segmentation, depth estimation, pose estimation
Field robotics – robotics in natural environments, forestry, underwater
Localization and mapping – SLAM, 3D reconstruction, LiDAR mapping

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

Visual SLAM R&D Engineer – November 2022 – Present
Developing visual SLAM algorithms for autonomous operation of mobile robots in a factory environment — Arrival UK, London, UK

Postdoctoral Researcher – September 2021 – September 2022
Developing techniques to use semantics and structure to segment 3D navigation maps, extract meaning and enable long term scene understanding.
Realtime LiDAR mapping and inventory generation in forests.
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; VR for forestry applications.
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, TensorRT
Creative Design	Blender, Illustrator, Photoshop, Krita, Kdenlive, Unreal Engine, Unity
CAD	OnShape, Autodesk Fusion 360
Circuit Design	KiCAD
Workshop Skills	3D Printing, Laser Cutting, Soldering, Welding, Casting, Turning

Publications

Journals

1. Y. Wang, M. Ramezani, M. Mattamala, **S. T. Digumarti** and M. Fallon,
   Strategies for large scale elastic and semantic LiDAR reconstruction.
   Robotics and Autonomous Systems, Volume 155, 2022
2. A. Proudman, M. Ramezani, **S. T. Digumarti**, N. Chebrolu and M. Fallon,
   Towards Real-Time Forest Inventory using Handheld LiDAR.
   Robotics and Autonomous Systems, 2022
3. **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
4. R. Chavarriaga, H. Sagha, A. Calatroni, **S. T. Digumarti**, G. Tröster, J. D. R. Millán and D. Roggen,
   The Opportunity challenge: A benchmark database for on-body sensor-based activity recognition.
   Pattern Recognition Letters, 34(15), 2013

Conferences

1. Y. Tao, M. Popovic, Y. Wang, **S. T. Digumarti**, N. Chebrolu and M. Fallon,
   3D Lidar Reconstruction with Probabilistic Depth Completion for Robotic Navigation.
   IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022
2. N. Chebrolu, **S. T. Digumarti** and M. Fallon,
   A Portable LiDAR System for Online Forestry Mapping. ForestSAT, 2022
3. **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
4. 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
5. **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
6. **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
7. **S.T. Digumarti**, J. Alonso-Mora, R. Siegwart, and P. Beardsley,
   Pixelbots 2014. Association for Computing Machinery (ACM) SIGGRAPH ‘16 Art Gallery, 2016.

8. M. Kriegleder, **S. T. Digumarti**, R. Oung and R. d'Andrea,
   Rendezvous with bearing-only information and limited sensing range.
   IEEE International Conference on Robotics and Automation (ICRA), 2015
9. A. Trivedi, A. Singh, **S. T. Digumarti**, D. Fulwani and 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, R. Chavarriaga, A. Calatroni, D. Roggen and G. Tröster
    Benchmarking classification techniques using the Opportunity human activity dataset.
    IEEE International Conference on Systems, Man, and Cybernetics, 2011

Workshops

1. A. Proudman, M. Ramezani, **S. T. Digumarti**, N. Chebrolu and M. Fallon,
   Online Forest Mapping and Inventory Generation using Handheld LiDAR.
   Workshop on Innovation in Forestry Robotics: Research and Industry Adoption, IEEE International Conference on Robotics and Automation (ICRA), 2022
2. H. Sagha, **S. T. Digumarti**, J. D. R. Millán, A. Calatroni, D. Roggen, G. Tröster, D. Bannach, P. Lukowicz, A. Ferscha and 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

Awards and Achievements

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

Teaching

2023	Instructor, Oxford Study Abroad Programme Designed and delivered lectures on robotics, computer vision and deep learning.
2021, 2022	Instructor, Oxford Prospects and Global Development Institute: AI and Robotics Designed and delivered lectures on robotics, computer vision and deep learning.
2022, 2023	Guest Lecturer, Experimental Robotics (USyd MTRX8700) Delivered lectures on topics in deep learning
2021	Co-coordinator and lecturer, Experimental Robotics (USyd MTRX8700) Organized the course, designed curriculum, lectured on topics in deep learning.
2020, 2021	Co-Lecturer, Experimental Robotics (USyd MTRX5700) 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.
2020	Co-organizer and lecturer, SIRIS PhD course: Foundations of Robotics Research Developed content and lectured on deep learning for robotics.
2019, 2020	Co-Lecturer, Introduction to Mechatronics (USyd MTRX1702) Delivered lectures on programming concepts in C. Designed and evaluated final exams.

Invited Talks and Demos

1. Presented a live demo of a Visual-inertial Lidar mapping system at
   The Ministry of Transport, London, UK, 2022
   UKAEA Culham Science Centre, UK, 2022
2. Invited Panelist for UG Orientation Day, IIT Jodhpur, India, 2020, 2021
3. Co-presented the Pixelbots robot system at
   Data Materialities, ACM SIGGRAPH, Anaheim, USA, 2016
   ETH Scientifica, Zürich, Switzerland, 2015
   El Hormiguero, Madrid, Spain, 2015
   Royal Institution's Christmas Lectures, London, UK, 2014

Mentorship

1. Team captain and academic mentor, USyd team for IROS OCRTOC, 2020
2. Mentor, USyd team for the Heineken zero-contact robot bar project, 2020
3. Co-supervisor for Bachelors' summer internship at Oxford University (1 project), 2022
4. Co-supervisor for Bachelors' theses and summer internships at USyd (5 projects), 2019-2021
5. Co-supervisor for Masters' and Bachelors' theses at ETH (10 projects), 2016-2019
6. Mentor and co-supervisor, ETH Fokus Project, *Scubo*, an undergraduate project for the development of an omnidirectional underwater robot (8 students), 2015-2016
7. Co-founder and Mentor, amateur robotics and electronics clubs of IIT Jodhpur, 2008-2012
8. 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. Co-organized IEEE RAS Winter School on SLAM in Deformable Environments, 2021
3. Organized conference-based paper discussion sessions at SIRIS/ACFR, 2020
4. Helped organize talks for a seminar series at SIRIS/ACFR, 2020
5. Associate Editor for TAROS 2023
6. Paper reviewer:
   a. IEEE Transactions on Robotics (T-RO), 2021 - 2023
   b. IEEE International Conference on Robotics and Automation (ICRA), 2019 - 2023
   c. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018 – 2023
   d. IEEE Robotics and Automation Letters (RAL), 2018 - 2022
7. Volunteer, Conference on Robot Learning (CoRL), 2018
8. Volunteer, Eurographics, 2015
9. 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