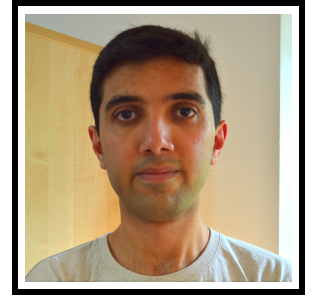


Raza Yunus

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Education

Dec 2022 – present **PhD Candidate**,
Max Planck Institute for Informatics, Saarland Informatics Campus, Germany.

Research Topic: Non-rigid 3D Reconstruction

Supervisor: Dr. Eddy Ilg

Oct 2017 – Aug 2020 **Masters in Informatics**,
Technical University of Munich, Germany.

Areas of Study: Computer Vision, Artificial Intelligence

CGPA: 1.5 (Distinction)

Thesis: Robust RGB-D SLAM based on Plane-Line-Point features for indoor scenes

Supervisor: Dr. Federico Tombari

Thesis Research:

- Developed a robust and general SLAM framework for indoor scenes, which takes the best of both worlds (Manhattan World assumption and feature tracking) by relying, when possible, on the MW structure for drift-free rotation estimation but able to seamlessly switch to feature tracking when MW does not hold.
- Provided a novel drift-free rotation estimation method that tracks Manhattan Frame observations with the help of a Manhattan Map, generated by directly detecting MFs from the extracted planes in the scene.
- Improved translation estimation, based on the concept of MW-based decoupled pose estimation, by combining point and line features with planes and an additional pose refinement step with Manhattan relationships.
- Explored and developed two dense mapping strategies, one which generates meshes from sparse plane points while the other provides a surfel-based map by generating surfels for non-planar and planar regions using superpixels and sparse plane points, respectively.

Sep 2013 – Jun 2017 **Bachelor of Engineering in Software Engineering**,
National University of Sciences and Technology, Islamabad, Pakistan.

CGPA: 3.56/4

Final Project: Detection and estimation of the nutritional value of food in real time using deep learning techniques:

- Recognized food items from images using Inception-v4 CNN trained on a self-built food dataset, achieving 95% Top-5 accuracy.
- Determined ingredients and nutritional attributes of identified food item by collecting food-related text data from the internet, learning word embeddings using Word2Vec and calculating the distance of attribute to food item's label.

Supervisor: Dr. Omar Arif

Publications

- 2024 R. Yunus et al., "Recent Trends in 3D Reconstruction of General Non-Rigid Scenes", Computer Graphics Forum, Vol. 43, Blackwell-Wiley, 2024.
- 2024 D. Das, C. Wewer, R. Yunus, E. Ilg, J.E. Lenssen, "Neural Parametric Gaussians for Monocular Non-Rigid Object Reconstruction", IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.
- 2021 R. Yunus, Y. Li and F. Tombari, "ManhattanSLAM: Robust Planar Tracking and Mapping Leveraging Mixture of Manhattan Frames", IEEE International Conference on Robotics and Automation (ICRA), 2021, pp. 6687-6693.

- 2021 Y. Li, R. Yunus, N. Brasch, N. Navab and F. Tombari, "RGB-D SLAM with Structural Regularities", IEEE International Conference on Robotics and Automation (ICRA), 2021, pp. 11581-11587.
- 2019 R. Yunus et al., "A Framework to Estimate the Nutritional Value of Food in Real Time Using Deep Learning Techniques", IEEE Access, Vol. 7, pp. 2643-2652.

Academic Service

- **Conference Reviewer:** CVPR, ECCV
- **Journal Reviewer:** IEEE Robotics and Automation Letters (RA-L)

Experience

- Jun – Nov 2022 **Cloud Service Maintainer - Mini Job**, EQUINUX AG.
 • Responsible for maintaining backend infrastructure for VPN product.
- Jun – Nov 2022 **Full Stack Developer**, LIVE TV GMBH, EQUINUX AG.
 • Responsible for full stack development of VPN product website, project management and supervision of working students with weekly sprint cycles.
- Dec 2020 – May 2022 **Software Developer**, LIVE TV GMBH, EQUINUX AG.
 • Maintaining office automation system which requires managing a network of sensors and controllers.
 • Backend data processing with the goal of collecting and enriching data for mobile clients.
 • Full stack development for VPN product website.
- Sep 2018 – Nov 2020 **Software Developer - Working Student**, LIVE TV GMBH, EQUINUX AG.
 Worked as a lead developer for two Android applications, handling development, testing and deployment.

Skills

- Programming C++, Python, Java, Matlab, Kotlin, Go, Ruby, SQL, Web (HTML, CSS, JavaScript, PHP)
- Libraries C++: OpenCV, PCL, Eigen, g2o, Ceres, OpenGV
 Python: Tensorflow, PyTorch, OpenCV
- Tools Git, Docker, Kubernetes, LaTeX

Honours

- Merit based scholarship in seven out of eight semesters in Bachelors.
- Prime Minister's e-Youth initiative award recipient (2014).

Languages

- Urdu **Mothertongue**
- English **Bilingual fluency** *IELTS 8.5/9 (C2)*
- German **Basic** *(A1)*