

Ali TOURANI

COMPUTER VISION · ROBOTICS · GENERATIVE AI

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| [\[StackOverflow\] ali-tourani](https://stackoverflow.com/users/10000000/ali-tourani) | [\[Medium\] alitourani](https://medium.com/@alitourani) | [\[GScholar\] alitourani](https://scholar.google.com/citations?user=alitourani)



Summary

Postdoctoral Research Associate at **SnT, University of Luxembourg**, specialized in **Computer Vision, Visual SLAM**, and **Vision-Language Models** for robot situational awareness and semantic scene understanding. Author of **25+ publications** in top-tier venues (**h-index: 14**), with **5+ open-source frameworks** actively used by the robotics community. **8+ years** of applied research spanning perception, multimodal data processing, and **generative AI** for scene reasoning, with experience in Ph.D. **mentoring** and **interdisciplinary**, collaborative research projects.

Education

Interdisciplinary Centre for Security, Reliability, and Trust, University of Luxembourg

Luxembourg, LUXEMBOURG

PH.D. IN COMPUTER SCIENCE (DOCTORAT EN INFORMATIQUE)

Apr. 2022 – Mar. 2026

- **Thesis:** Enhancing Robots' Situational Awareness using Imperceptible Artificial Landmarks ([thesis link](#))
 - Nominated for the **Excellent Thesis Award** of the University of Luxembourg (2026)
- **Affiliation:** SnT, Automation and Robotics Research Group (ARG)
- **Supervisor:** Prof. Dr. Holger VOOS ([link](#)) | **Advisor:** Dr. Jose Luis SANCHEZ-LOPEZ ([link](#))

Department of Computer Engineering, University of Guilan

Rasht, Guilan, IRAN

M.SC. COMPUTER ENGINEERING (SOFTWARE ENGINEERING STREAM)

Sep. 2016 – Jan. 2019

- **Thesis:** Automatic Vehicle Speeding Violation Detection using Computer Vision
- **Supervisor:** Prof. Asadollah Shahbahrami ([link](#))
- **GPA:** 18.97 out of 20.00 (Excellent)

Department of Computer Engineering, University of Guilan

Rasht, Guilan, IRAN

B.SC. COMPUTER ENGINEERING (SOFTWARE ENGINEERING STREAM)

Sep. 2009 – Jun. 2013

- **Thesis:** An E-Ticketing Software Platform for Appointment Scheduling in Medical Clinics

Work Experience (since 2016)

Interdisciplinary Centre for Security, Reliability, and Trust (SnT)

Luxembourg, LUXEMBOURG

POSTDOCTORAL RESEARCH ASSOCIATE (FULL-TIME)

Apr. 2026 – Present

- **Key Focus:** **Vision-Language Model (VLM)** grounding for semantic scene understanding and query-based retrieval.
- Integrated **VLMs** with robotic reasoning for **context-aware perception** in unstructured environments.
- Designed and validated **real-world robotic** systems with end-to-end AI-driven perception and reasoning for practical robotics use.
- Mentored **three Ph.D. students** across system development, experimental design, and publication workflows.

DOCTORAL RESEARCHER (FULL-TIME)

Apr. 2022 – Mar. 2026

- Developed **computer vision** and **visual SLAM** frameworks for **robot perception** to improve situational awareness.
- Architected and released **5+ open-source** projects in **robotics and AI**, adopted by the research community.
- Authored **15+ publications** across top-tier scientific venues, achieving an **h-index of 14**.

AVID Technology Development Co.

Rasht, Guilan, IRAN

FULL-STACK DEVELOPER (FULL-TIME)

Jan. 2019 – Dec. 2021

- Built React/Node.js **full-stack** systems for **international** enterprise clients across **5+ countries**, as production-grade software delivery.
- **Mentored** junior developers and led **Agile/Scrum** sprints as secondary Scrum Master for **teams of 10+**.
- Implemented **CI/CD pipelines**, DevOps workflows, and **Docker-based** deployments to support reliable production releases.

Department of Computer Engineering, University of Guilan

Rasht, Guilan, IRAN

UNIVERSITY LECTURER (CONTRACT)

Sep. 2019 – Sep. 2021

- Lectured undergraduate courses, including **Computational Intelligence** and **Software Laboratory**, for four semesters.
- Supervised +20 student projects focused on **machine learning**, **deep learning**, and **software design**.

Guilan Science and Technology Park Business Incubator

Rasht, Guilan, IRAN

RESEARCH SOFTWARE ENGINEER (PART-TIME)

Jul. 2019 – Jul. 2021

- Deployed two production-grade **computer vision** systems for **vehicle tracking** and **license plate recognition** in real-world traffic.
- Bridged **research** and **industry** by translating academic methods into scalable **Intelligent Transportation Systems (ITS)**.

*** A more comprehensive overview of my academic, research, and professional experience is available on my [personal website](#). ***

Selected Publications

International Conferences

- 2024 [A. Tourani](#), S. Ejaz, H. Bavle, J.L. Sanchez-Lopez, and H. Voos, “Towards Localizing Structural Elements: Merging Geometrical Detection with Semantic Verification in RGB-D Data,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS’24)*, 14th Workshop on Planning, Perception, and Navigation for Intelligent Vehicles, Abu Dhabi, UAE [PDF].
- 2023 [A. Tourani](#), H. Bavle, J.L. Sanchez-Lopez, R. Muñoz Salinas, and H. Voos, “Marker-based Visual SLAM leveraging Hierarchical Representations,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS’23)*, pp. 3461-3467, Detroit, Michigan, USA [DOI].

Peer-review Journals

- 2026 [A. Tourani](#), S. Ejaz, H. Bavle, M. Fernandez-Cortizas, J.L. Sanchez-Lopez, and H. Voos, “vS-Graphs: Tightly Coupling Visual SLAM and 3D Scene Graphs Exploiting Hierarchical Scene Understanding,” *IEEE Robotics and Automation Letters*, Accepted [DOI].
- 2025 I.M. Chekam, I. Pastor-Martinez, [A. Tourani](#), J.A. Millan-Romera, L. Ribeiro, P.M. Bastos Soares, H. Voos, and J.L. Sanchez-Lopez, “Interpretable Robot Control via Structured Behavior Trees and Large Language Models,” *IEEE Access*, vol. 13, pp. 200905-200916 [DOI].

*** The complete list of papers and preprints is available on my [Google Scholar](#) profile (h-index: 14). ***

Selected Projects

Visual S-Graphs (vS-Graphs)

[github] [snt-arg/visual_sgraphs](#)

- A robotics framework for semantic scene understanding and generating environments’ interpretable 3D digital twins.

RAG VisualRec

[github] [recsys-lab/rag-visualrec](#)

- A Generative AI-based resource for enhancing reasoning with visual, audio, and textual embeddings.

Popcorn Framework

[github] [recsys-lab/popcorn](#)

- Multimodal framework for visual embeddings extraction, fusion, augmentation, and RAG-based retrieval.

iMarker Detector Framework

[snt-arg.github.io/iMarkers/](#)

- A framework for the detection and recognition of iMarkers, imperceptible landmarks for robotics and AR applications.

Honors & Awards

2026	Nomination , Best Ph.D. Thesis Award Nominee, University of Luxembourg	LUXEMBOURG
2022	Scholarship , Competitive Fully Funded Ph.D. Position (TRANSCEND Project), University of Luxembourg	LUXEMBOURG
2019	Award , Best Student Researcher for Scientific and Practical Contributions (class of 2016), University of Guilan	IRAN
2019	Award , Academic Excellence: Highest GPA in M.Sc. Computer Engineering (class of 2016), University of Guilan	IRAN

Skills

	Software Development	Tools & Technologies	Soft Skills
Desktop Stack	Expert: Python, C++ Proficient: C# Familiar: Java		
Web Stack	Expert: React.js, Node.js, JavaScript, CSS, HTML Proficient: Next.js, GraphQL Familiar: Webpack		
Databases	Expert: Microsoft SQL, MySQL, Proficient: PostgreSQL, MongoDB, SQLite Familiar: Elasticsearch, Neo4j		
Extras	Expert: Git, Linux, Jira Proficient: Docker, REST API, .NET Framework Familiar: CI/CD, VMware		
Computer Vision	Expert: OpenCV, YOLO Proficient: CLIP, Scikit-Image Familiar: EmguCV, AForge.NET		
Machine Learning	Expert: HuggingFace Transformers, Keras Proficient: PyTorch, TensorFlow Familiar: Scikit-learn		
Robotics	Expert: ROS2, RViz Proficient: PCL, Voxelblox Familiar: GTSAM, Gazebo		
Generative AI & LLM	Expert: VLM Proficient: RAG, GPT Familiar: Llama, SentenceTransformers		
Communication Management	Presentation, Scientific Writing, Technical Documentation		
Teamwork	Agile, Scrum, Mentoring (students, developers, interns), Project Coordination		
Languages	Interdisciplinary collaboration, Team spirit, Cross-cultural collaboration		
	English (C1), French (B1), German (A2), Luxembourgish (A1), Turkish (A1), Persian (mother tongue)		

Reference

Prof. Dr. Holger VOOS

holger.voos@uni.lu

FULL PROFESSOR IN ENGINEERING SCIENCE, UNIVERSITY OF LUXEMBOURG, LUXEMBOURG

(Ph.D. Supervisor)

Dr. Jose Luis SANCHEZ-LOPEZ

jose-luis.sanchezlopez@uni.lu

SENIOR RESEARCH SCIENTIST, AUTOMATION & ROBOTICS GROUP (ARG), SNT, LUXEMBOURG

(Ph.D. Advisor)

Dr. Yashar DELDJOO

deldjooy@acm.org

SENIOR RESEARCH SCIENTIST AND ASSOCIATE PROFESSOR, POLYTECHNIC UNIVERSITY OF BARI, ITALY

(Research Collaboration)