EXPRESSION OF INTEREST FORM

This Expression of Interest (EOI) document has been prepared to enable researchers of Istanbul Technical University (ITU) to be rapidly and effectively included in existing and potential consortia, primarily within the scope of Horizon Europe and other International Programmes.

The information collected through this form will be used by the ITU International Projects Office for the following purposes:

- Matching researchers with ongoing consortium searches,
- Communication with international project partners,
- Targeted invitations and information dissemination for relevant calls.

Contact Person/Scientist in charge *(data of the principal investigator of the research group/lab or scientific supervisor)* **Name**	Serhat
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Laboratory /Department /Institute /Centre / **Name**	İTÜ Railway System Engineering Control and Automation Laboratory
Brief description of the Centre/Research Group *(*Please provide a brief description of your research group or organisational unit, including research infrastructure, laboratory facilities, team size and industry collaborations.)	ITU Railway Systems Engineering Control and Automation Laboratory operates in the fields of real-time monitoring of railway infrastructure, control automation, and intelligent signalling systems. The laboratory has infrastructure and some related test equipment for distributed fiber optic sensing (DAS/DFOS), structural health monitoring (SHM), and train detection. The academic staff consists of 1 professor, 3 research assistants, and industry partners.
Address	
Research Area (Please provide 5–10 keywords that best describe your research areas and expertise.)	Interlocking, Driver Assistant Systems, Signalling, Distributed Acoustic Sensing (DAS) · Distributed Fiber Optic Sensing (DFOS) · Railway Infrastructure Monitoring · Structural Health Monitoring (SHM) · Train Detection & Tracking · Railway Safety & Automation · Remote Sensing · Signal Processing · Smart Rail Systems · Rayleigh Backscattering
Please list your relevant previous projects, indicating the programme, project name, year and role.	1. INDUSTRY, RESEARCHER, Stray Current Analysis in Rail Systems Project, Enforcing Institution: HI-SIM Technology (Institution not registered in the system) (Still continues). 2. INDUSTRY, RESEARCHER, TÜBİTAK TEYDEP – 7240096 – HISIMDAS: Mobile Digital Assistant System for Fast and Energy-Efficient Driving, Enforcing Institution: HI-SIM Technology (Institution not registered in the system), Sponsor Institution: TÜBİTAK TEYDEP (Institution not registered in the system) (Domestic) (Still continues). 3. INDUSTRY, RESEARCHER, Train Movement Simulation Project for the Development of a Capacity Allocation Monitoring and Planning Program (KATİP-THS), Enforcing Institution: HI-SIM Technology (Institution not registered in the system), 01 August 2022 – 01 August 2024. 4. INDUSTRY, RESEARCHER, OBATO BRAKING CURVE ALGORITHM, Enforcing Institution: HI-SIM Technology (Institution not registered in the system), 01 January 2020 – 01 January 2024. 5. INDUSTRY, RESEARCHER, Rail System Operations Simulation Project (HiOpSim), Enforcing Institution: HI-SIM Technology (Institution not registered in the system), 01 January 2020 – 01 December 2023.

	6. INDUSTRY, RESEARCHER, ERTMS/DTYS ONBOARD BRAKING CURVE ALGORITHM, Enforcing Institution: HI-SIM Technology (Institution not registered in the system), 01 August 2021 – 01 August 2023. 7. INDUSTRY, RESEARCHER, ATP BRAKING CURVE ALGORITHM, Enforcing Institution: HI-SIM Technology (Institution not registered in the system), 01 February 2020 – 01 February 2023. 8. INDUSTRY, RESEARCHER, Railway Signalization Action Plan Current Status and Future Outlook Analysis Service, Enforcing Institution: İTÜ NOVA (Institution not registered in the system), 01 December 2021 – 01 December 2022. 9. OTHER, RESEARCHER, Rail System Operations Simulation Project, 03 February 2020 – 01 November 2021. 10. INDUSTRY, RESEARCHER, AVRASYA, SARIYER, HASKÖY, BELKAHVE, SELÇUKGAZİ, SABUNCUBELİ, ÇAMLICA TUNNELS – FM RADIO REPEATER SYSTEM, Enforcing Institution: ABE TEKNOLOJİ MÜHENDİSLİK HİZMETLERİ SANAYİ VE TİCARET A.Ş., 01 January 2016 – 01 December 2019. 11. INDUSTRY, RESEARCHER, LEVEL CROSSING SAFE PASSAGE SYSTEM FOR VEHICLES, Enforcing Institution: ABE TEKNOLOJİ MÜHENDİSLİK HİZMETLERİ SANAYİ VE TİCARET A.Ş., 01 January 2017 – 01 December 2019. 12. INDUSTRY, RESEARCHER, NEW GENERATION INDOOR DRIVER INFORMATION SYSTEM, Enforcing Institution: ABE TEKNOLOJİ MÜHENDİSLİK HİZMETLERİ SANAYİ VE TİCARET A.Ş., 01 November 2015 – 01 August 2019. 13. INDUSTRY, RESEARCHER, NEW GENERATION OF FAIL-SAFE COMMUNICATION SYSTEMS FOR RAILWAY VEHICLES, Enforcing Institution: ABE TEKNOLOJİ MÜHENDİSLİK HİZMETLERİ SANAYİ VE TİCARET A.Ş., 01 January 2016 – 01 November 2017. 14. SECTOR, RESEARCHER, RAILWAY MONITORING AND SIGNALIZATION PROJECT, Enforcing Institution: ABE TEKNOLOJİ MÜHENDİSLİK HİZMETLERİ SANAYİ VE TİCARET A.Ş., 01 January 2015 – 01 December 2016. 15. INDUSTRY, RESEARCHER, TÜBİTAK-1140093 – İDİS RAILWAY MONITORING AND SIGNALIZATION PROJECT, Enforcing Institution: ABE TEKNOLOJİ MÜHENDİSLİK HİZMETLERİ SANAYİ VE TİCARET A.Ş., Sponsor Institution: TÜBİTAK (Institution not registered in the system) (Domestic), 01 January 2015 – 01 December 2016.
Proposed Project Idea or Area of Interest: (If applicable, please briefly outline a concept idea, the problem you aim to address, or your specific area of interest.)	Our research group has demonstrated expertise and hands-on experience across several interconnected domains, positioning us as a strong contributor to collaborative research and industrial development projects. In the field of energy-efficient transportation, we have a proven track record in developing energy-optimized driving strategy algorithms for both rail and road vehicles. Building on this experience, we are well-equipped to lead or contribute to projects targeting the development of next-generation Advanced Driver Assistance Systems (ADAS), eco-driving optimization frameworks, and real-time energy management platforms in close collaboration with industry partners. In railway signalling and electrification, our team has extensive field experience in interlocking systems, signalling modernization, and electrification optimization. This practical background enables us to actively contribute to projects aimed at upgrading legacy signalling infrastructure, improving power efficiency across rail networks, and developing interoperable digital railway systems. Our most distinctive expertise lies in Distributed Acoustic Sensing (DAS)-based infrastructure monitoring. We have successfully repurposed existing telecommunication fiber optic cables — already deployed along railway lines and other infrastructure corridors — as high-precision sensing systems using DAS technology. Leveraging this experience, we can contribute to and lead projects covering:

	• Real-time train, vehicle, and moving object detection, including precise localization and speed estimation along monitored corridors • Broken rail and track defect detection, enabling condition-based and predictive maintenance strategies • Structural health monitoring of railway bridges, tunnels, and other critical civil infrastructure using long-range distributed sensing • Perimeter security and intrusion detection in railway safety zones, with real-time alerting capabilities • AI-powered signal classification and anomaly detection applied to large-scale DAS data streams, seamlessly integrable with existing traffic management, SCADA, and signalling systems Across all these areas, our group is capable of engaging at both the research and applied levels, from proof-of-concept development and laboratory testing through to field trials and pilot demonstrations.
Potential Contributions to Projects	x Scientific / technical research x Methodology development x Modelling / simulation x Data analysis / artificial intelligence x Experimental studies / testing x Pilot / demonstration activities x Socio-economic analysis / policy contribution x Education, dissemination and impact activities ☐ Other (please specify):
Preferred Role in Consortia	☐ Coordinator x Partner
Programmes and Calls of Interest (Please indicate the programme(s) you are interested in and, if possible, specify the call identifier and/or title.	x Horizon Europe Clusters ☐ Erasmus+ ☐ Digital Europe ☐ EIT (HEI / KIC, etc.) ☐ MSCA ☐ ERC ☐ Other (please specify): Specific call identifier and/or title:
Additional Notes **(**Please provide any additional information or specific remarks you would like to share with the International Projects Office.)	“HORIZON-JU-ER-2025-02”- type projects are welcome.