

## EXPRESSION OF INTEREST FORM

<b>Contact Person/Scientist in charge</b> <i>(data of the principal investigator of the research group/lab or scientific supervisor)</i>	<b>Name</b>	Tufan
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<b>Laboratory /Department /Institute /Centre /</b>	<b>Name</b>	Artificial Intelligence and Intelligent Systems Laboratory Faculty of Electrical and Electronics Engineering Istanbul Technical University (ITU)
<b>Brief description of the Centre/Research Group</b> <i>(Please provide a brief description of your research group or organisational unit, including research infrastructure, laboratory facilities, team size and industry collaborations.)</i>		<p>The Artificial Intelligence and Intelligent Systems Laboratory focuses on the development of advanced intelligent modelling, learning, and control methodologies for complex systems. The research group has strong expertise in fuzzy systems, neural networks, hybrid neuro-fuzzy models, data-driven system identification, explainable and interpretable AI, and stability-guaranteed learning frameworks.</p> <p>The laboratory is equipped with modern computational infrastructure for large-scale simulations, data analytics, and machine learning experiments, as well as experimental platforms for control and robotics-oriented research. The team typically consists of faculty members, postdoctoral researchers, PhD and MSc students. The group maintains active collaborations with national and international universities, research centres, and industry partners, particularly in the areas of intelligent control, autonomous systems, and industrial AI applications.</p> <p>For further information, representative publications, ongoing activities, and research outputs of the group are publicly available via the ResearchGate laboratory page:  <a href="https://www.researchgate.net/lab/Artificial-Intelligence-and-Intelligent-Systems-Laboratory-Tufan-Kumbasar">https://www.researchgate.net/lab/Artificial-Intelligence-and-Intelligent-Systems-Laboratory-Tufan-Kumbasar</a></p> <p>Dissemination activities related to intelligent systems, fuzzy logic, and AI-based modelling can also be accessed through the director's YouTube channel:  <a href="https://www.youtube.com/@TufanKumbasar">https://www.youtube.com/@TufanKumbasar</a></p>
	<b>Address</b>	Istanbul Technical University, Ayazaga Campus Maslak-34469 Istanbul/ TÜRKİYE
<b>Research Area</b> <i>(Please provide 5–10 keywords that best describe your research areas and expertise.)</i>		Intelligent systems Machine Learning Artificial Intelligence Data-driven system identification Interpretable and explainable AI Robotics and autonomous systems Artificial intelligence for engineering applications
<b>Please list your relevant previous projects, indicating the programme, project name, year and role.</b>		<ol style="list-style-type: none"> <li>1. Main Investigator, "An Artificial Intelligence-Assisted Innovative Method and Hardware Design for Patient-Specific Planning in Vocal Fold Surgery", founded by the Scientific and Technological Research Council of Türkiye, 2026–2028</li> <li>2. Main Investigator, "Design of Swarm Drone Networks for Maximum Coverage of Moving Targets", Founded by the Scientific and Technological Research Council of Türkiye, 2025–2027</li> <li>3. Main Investigator, "Development of an AI-Assisted CMOS-MEMS Platform for Optical Transmission and Classification of Magnetic Resonance Imaging Signals", founded by The Scientific Research Centre of Istanbul Technical University, 2024–2026.</li> <li>4. Principal Investigator, "AI-based Energy Efficient Surrounding Control of Collaborative Unmanned Aerial Vehicles under Cyber-attacks", Founded by the Scientific and Technological Research Council of Türkiye, 2024–2025.</li> </ol>

	<p>5. Principal Investigator, “Developing High-Performance Deep Neural Networks with Fuzzy Layers”, Founded by MathWorks Inc, 2023–2026.</p> <p>6. Academic Advisor, “Intelligent Control Methods in Electro–Optic Systems”, Founded by the ASELSAN, Turkish Armed Forces Company, 2022–2023</p> <p>7. Principal Investigator, “Deep Learning based Type–2 Fuzzy Systems for Regression and Classification problems”, founded by Young Scientist Award Programme, Turkish Academy of Sciences, 2021–2023.</p> <p>8. Principal Investigator, “Development and Deployment of Deep Learning based Type–2 Fuzzy Systems”, Founded by the Scientific and Technological Research Council of Türkiye, 2019–2022.</p>
<p><b>Proposed Project Idea or Area of Interest:</b> (If applicable, please briefly outline a concept idea, the problem you aim to address, or your specific area of interest.)</p>	<p>The proposed area of interest focuses on uncertainty quantification in data-driven and learning-based models for complex engineering systems. The aim is to develop interpretable artificial intelligence and learning frameworks that explicitly model, propagate, and manage different sources of uncertainty arising from data, modelling assumptions, and environmental variability.</p> <p>A particular emphasis is placed on hybrid neuro-fuzzy and learning-based architectures with built-in theoretical guarantees, such as stability, robustness, and boundedness under uncertainty. These approaches are intended to bridge the gap between black-box learning methods and reliable decision-making in safety-critical applications. Potential application domains include autonomous and robotic systems, energy and power systems, and advanced industrial automation, where trustworthy uncertainty-aware models are essential for control, prediction, and decision support.</p>
<p><b>Potential Contributions to Projects</b></p>	<p><input checked="" type="checkbox"/> Scientific / technical research</p> <p><input checked="" type="checkbox"/> Methodology development</p> <p><input checked="" type="checkbox"/> Modelling / simulation</p> <p><input checked="" type="checkbox"/> Data analysis / artificial intelligence</p> <p><input checked="" type="checkbox"/> Experimental studies / testing</p> <p><input checked="" type="checkbox"/> Pilot / demonstration activities</p> <p><input type="checkbox"/> Socio-economic analysis / policy contribution</p> <p><input type="checkbox"/> Education, dissemination and impact activities</p> <p><input type="checkbox"/> Other (please specify):</p>
<p><b>Preferred Role in Consortia</b></p>	<p><input type="checkbox"/> Coordinator</p> <p><input checked="" type="checkbox"/> Partner</p>
<p><b>Programmes and Calls of Interest</b> (Please indicate the programme(s) you are interested in and, if possible, specify the call identifier and/or title.)</p>	<p><input checked="" type="checkbox"/> Horizon Europe Clusters</p> <p><input type="checkbox"/> Erasmus+</p> <p><input checked="" type="checkbox"/> Digital Europe</p> <p><input type="checkbox"/> EIT (HEI / KIC, etc.)</p> <p><input checked="" type="checkbox"/> MSCA</p> <p><input checked="" type="checkbox"/> ERC</p> <p><input type="checkbox"/> Other (please specify):</p> <p>Specific call identifier and/or title:</p>
<p><b>Additional Notes</b> (Please provide any additional information or specific remarks you would like to share with the International Projects Office.)</p>	