IMU-based object activity recognition: How accurate is your approach to recognize industrial processes?

Rulebook for the competition

Eligibility & Registration	• There are no restrictions regarding qualifications or employers for registration. The organizers and associated staff are not permitted to participate. You can either participate as an individual person or as a team • Registration is submitted via our central contact email address pal2sim-competition@iml.fraunhofer.de with following information: Name/team name, team size, email address, university/institute/company • Registration opens January 31 and closes on February 28, 2026 • After the registration deadline, participants will receive an email with further information about the challenge and all provided datasets.

Dataset & Resources	• All registered competitors will receive an email at March 2nd with the following data that can be used for building the classification model
	  ○ synchronized IMU and barometer signals of the recorded processes at a Rhenus SE & Co. KG facility, including activities such as driving a forklift, lowering, lifting, or wrapping a pallet
	  ○ detailed activity annotations based on a defined taxonomy
	  ○ anonymized video recordings used to create the annotations
	  ○ a "get-started" Python environment with prepared code for data loading and preprocessing so you can focus on classification
	  ○ access to the associated SenSys 2026 paper describing the sensor setup and our single-labeling approach that you are expected to outperform

The Goal & Evaluation	• The goal of all competitors is to develop a multi-label model for supervised learning that performs the classification of pallet activities. • Any methodological approach is permitted, classical machine-learning techniques, deep learning, or hybrid methods, as long as the provided training material is used as the basis for model development. • From the date of data provision (March 2nd) until the submission deadline (April 30th) all participants can work on their model in the provided python environment • All participants will be provided with the code, which they can use to evaluate their solution • As evaluation metric the Matthew Correlation Coeficient (MCC) will be used. The competitor that reaches the highest MCC will win the competition • Participants must submit their solutions in a specified format by the deadline. Late submissions cannot be considered for reasons of fairness.
Timeline	• Registration start: January 31, 2026 • Registration end: February 28, 2026 (EOD) • Data provision: March 2, 2026 • Q&A session: Two sessions during the competition period and as required by participants • Submission: April 30, 2026 (EOD) • Competition presentation & results announcement: May 11–14, 2026 (During CPS-IoT Week)
Content during CPS-IoT Week	• Introduction by the organizers • Participants present their approach and results • Expected duration: 10 - 15 minutes per person/team (presentation length depends on the participants) • Award ceremony • Outlook for research by the organizers • Closing discussion
Support & Communication	• Questions can be submitted by email to pal2sim-competition@iml.fraunhofer.de • Important information will be shared with all participants immediately by email
Prize	• The winning prize will be revealed on the website www.pal2sim.com. Check here so you don't miss out.