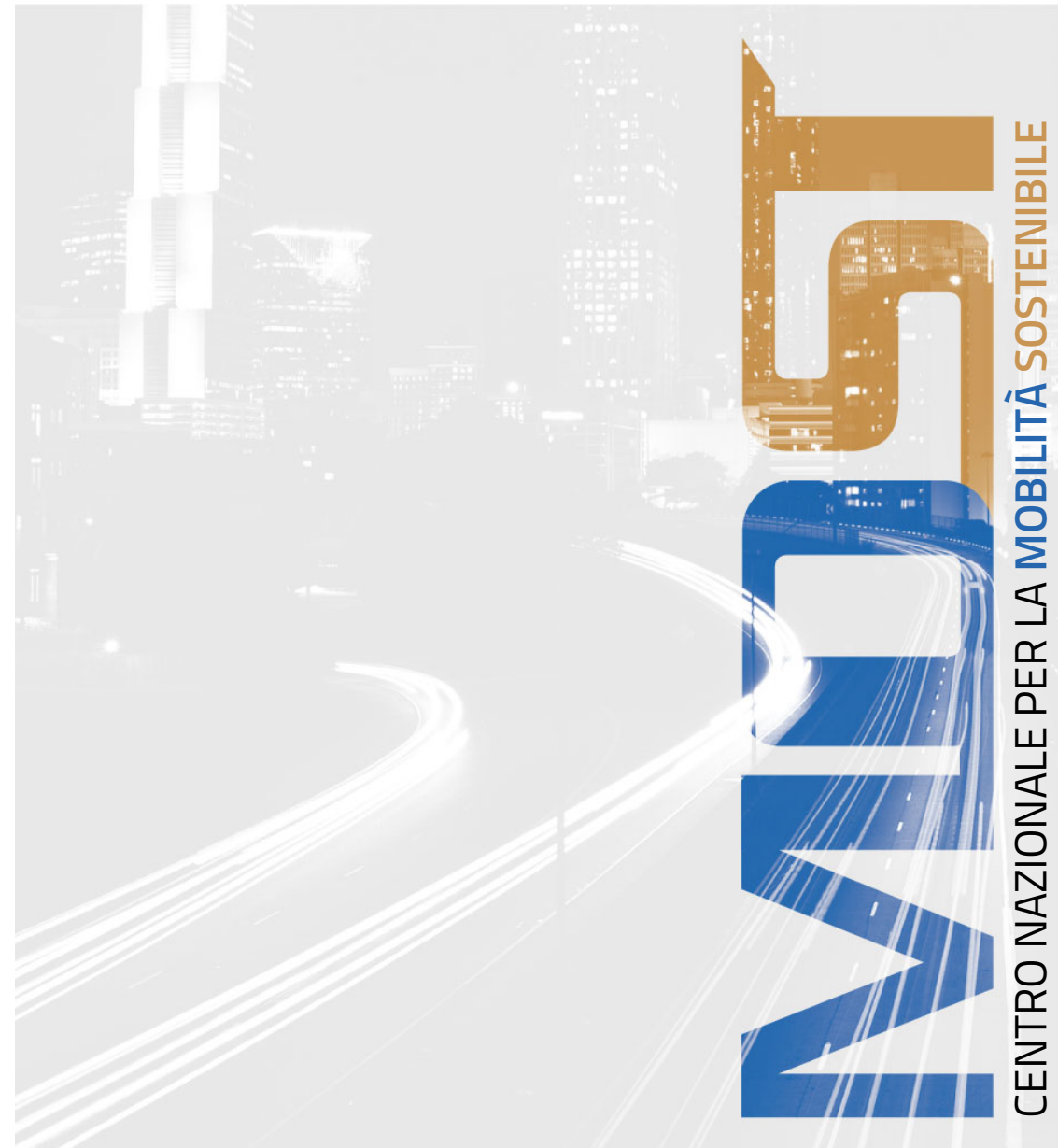


Spoke 4: Rail Transportation

Maurice ter Beek (ISTI, Pisa)

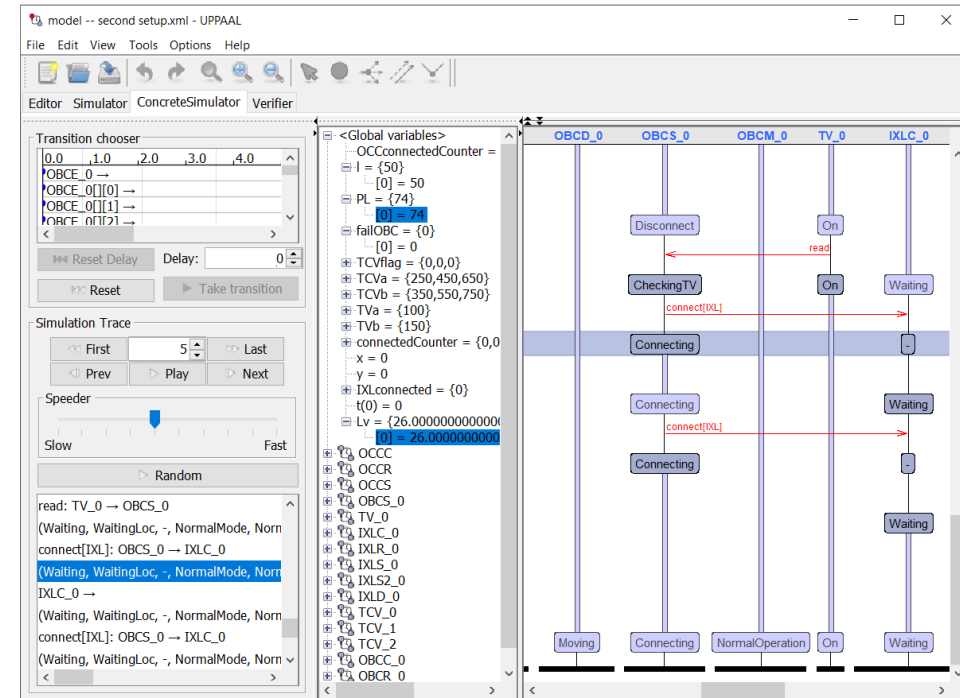
DIITET conference
22 June 2023
Firenze



CNR minor involvement

T1.3: Resilient and sustainable railway infrastructure

«*Formal modelling and analysis of critical software systems (e.g., stochastic model-based analysis, advanced/statistical model checking, resilience/energy consumption trade-offs)*»



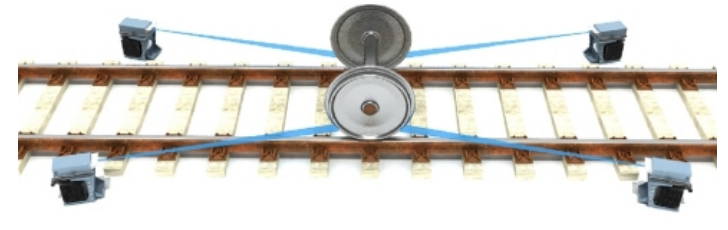
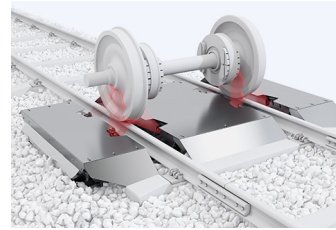
T4.2: Automation of terminal operation

«*2D-3D vision systems to support the automatic creation of railway convoy*»

T4.4: Augmented reality for personnel training

«*Demonstrator of virtual and augmented reality devices for personnel to monitor the convoy creation*»

CNR major involvement



T3.1: Learning formal models for predictive maintenance

«Development of **railway specific model learning** techniques considering real-time aspects and a degree of uncertainty»

«Build and exploit **digital twin models** of trains to facilitate predictive maintenance by real-time monitoring and simulation»

«Development and industrial validation of a prototypical railway specific predictive monitoring and maintenance system»

T3.2: On board monitoring systems for rolling stock and infrastructure

«Low-cost vision system for determining lateral shift of train and for 3D reconstruction of ballast»

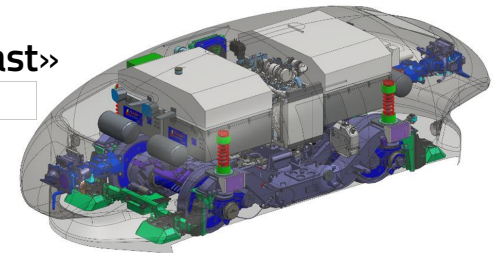
T3.3: Way side monitoring systems for rolling stock and infrastructure

«2D-3D vision systems for data acquisition»

«Machine Learning based methods and HW/SW integrated system for anomalies detection and classification»

T3.4: Drone for autonomous infrastructure inspection

«Vision based system for inspection and patrolling as part of the living lab, to complete the functionality of the drone»



Status at M9

👍 **Defined:** partners' subtasks, expected collaborations and content of first deliverables

👍 **Identified:** first demonstrator for computer vision and typology of the drone (aerial)

👍 **Agreed:** backup plans for data (NDA with Trenord) and test vehicle and track (Mermecc)

👎 **Slight deviation:** due to the limited access to data (e.g., no data about wayside systems)

👎 **Behind schedule, due to lack of funding:** delayed personnel recruiting and equipment acquisition (primarily CNR...)



MOST

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