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Extreme-scale Urban Mobility Data Analytics as a Service

Transforming Urban Mobility through Data-driven decision making

EMERALDS is designing, developing and creating an urban data-oriented **Mobility Analytics as a Service (MAaaS)** toolset, consisting of reusable software modules which will exploit the untapped potential of extreme urban mobility data.

The toolset can empower decision makers in urban smart city environments to:

· Collect and manage ubiquitous spatio-temporal data of high-volume, high-velocity and of high-variety.

· Analyse data online and offline.

· Import data to real-time responsive AI/ML algorithms and visualise results in interactive dashboards.

· Implement privacy preservation techniques at all abstraction layers of the computing continuum.

Use Cases

Trip Characteristics Inference and Traffic Flow Data Analytics
Riga, Latvia
Watch the video

Multi-modal integrated traffic management
Rotterdam, The Netherlands
Watch the video

Risk-assessment, prediction and forecasting
The Hague, The Netherlands
Watch the video

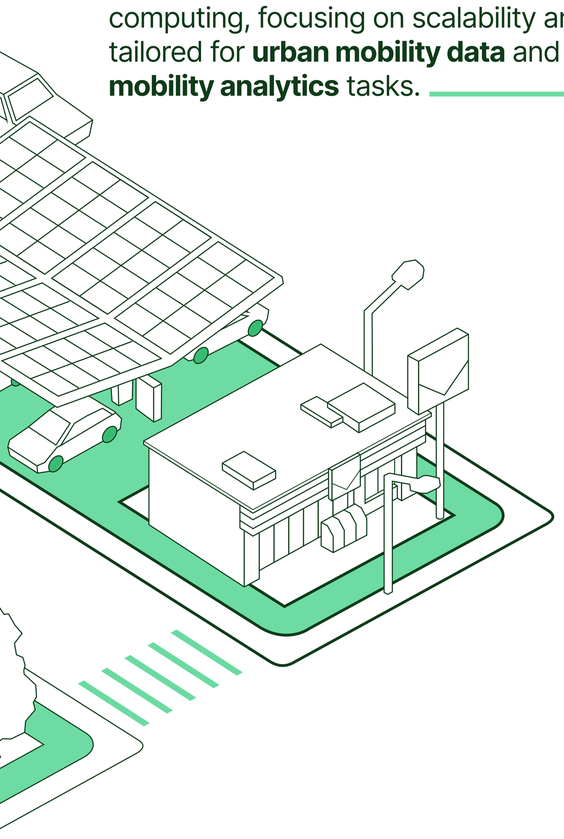
Toolset

Extreme-Scale Mobility Data Analytics uses innovative techniques to analyse vast and diverse mobility datasets.

Privacy-aware in situ data harvesting collects **edge data** while respecting **privacy**, merging data streams, and implementing real-time privacy checks.

Extreme-scale Cloud/Fog Data Processing emphasises efficient processing of large and complex datasets in cloud computing, focusing on scalability and real-time capabilities tailored for **urban mobility data** and supporting various **mobility analytics** tasks.

Toolset web page
emeralds-horizon.eu/emeralds-toolset



Machine Learning Components

EMERALDS integrates Active Learning, Federated Learning, and Explainable AI in the realm of urban mobility AI and machine learning.

Active Learning optimises data labelling by selecting the most informative points.

Federated Learning ensures privacy by training models across decentralised devices, utilising diverse urban mobility data sources.

Explainable AI enhances model transparency, aiding AI-driven decision understanding in spatiotemporal contexts.

Impact

EMERALDS profoundly impacts Europe across scientific, economic, and societal dimensions.

Science: Advancing AI/ML methods and business models in urban mobility data mining, emphasising high-quality knowledge creation, transparency, and trust.

Economics: Fostering innovation-based growth, creating new jobs and business opportunities, and encouraging data-driven solutions for cities.

Society: Aligning with EU policy priorities, supporting green initiatives and ensuring privacy and accountability in AI.

EMERALDS strives to integrate its research and innovation outcomes into society, focusing on transparency and trustworthiness.

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