MARVEL

Multimodal
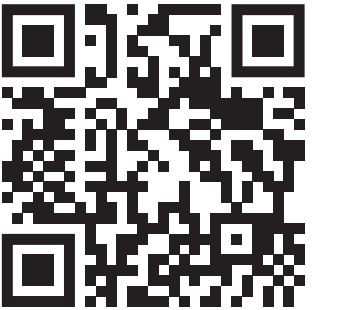## Extreme Scale Data Analytics
For Smart Cities Environments

MARVEL **Benefits**

- A privacy-aware solution for revealing valuable insigts to improve quality of life
- Event detection and situational awareness in smart cities environments to support decision-making
- Breaking technological silos
- Tested in real-world complex settings for ensuring accurate, cross scale, and in-time predictions
- Contribution of extremely large audio visual processed datasets to support the European Data-driven Economy

MARVEL **Functionalities**

- Innovative technologies for data management, acquisition, distribution and storage
- AI-based multimodal perception and audio-visual scene recognition
- E2F2C distributed ubiquitous computing architecture
- Federated learning and edge processing
- GPU accelerated stream processing
- Data privacy, anonymisation and security assurance
- Security at the edge and trusted execution environments
- Data Corpus-as-a-Service
- Decision-making and data visualization

MARVEL **in Smart Cities**

City Monitoring in Trento
Inform local authorities and emergency services of potential anomalous events that may lead to dangerous situations

Road Traffic Management in Malta
Data monitoring and analysis for planning infrastructure upgrades or implementing mobility management measures

Crowd Monitoring and Security in Novi Sad
Data collection using drones and experimental evaluation in controlled environments to support the Trento and Malta use cases

MARVEL **Architecture**

- Sensing and perception subsystem
- Security, privacy and data protection subsystem
- Data management and distribution subsystem
- Audio, visual and multimodal AI subsystem
- Optimised E2F2C processing and deployment subsystem
- E2F2C infrastructure
- System outputs

MARVEL **Consortium**

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