M4D - MULTIMODAL DATA FUSION AND ANALYTICS GROUP

MultiMoDal Data Fusion and Analytics Group

Head – Senior Researcher
Dr. Stefanos Vrochidis

Bridging the gap between Horizon and national security funds

MultiMoDal Data Fusion and Analytics Group

MKLab
Multimedia Knowledge and Social Media Analytics Laboratory

Information Technologies Institute

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

CERTH

Center for Research and Technology Hellas - CERTH

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

Large research center in Northern Greece

Founded in 2000

> 1000 people

> 1200 projects

Annual turnover > EUR 25M

5 institutes - ICT, Chemical Engineering, Transport, Health and Bio-technology

http://www.certh.gr

No. 1 in Greece in H2020 projects

In the list of TOP-10 E.U. institutions in competitive funding

Multimedia Knowledge and Social Media Analytics Lab (MKLab)

MKLab
Multimedia Knowledge and Social Media Analytics Laboratory

> 200 people involved

> 800 publications

Research Areas

- Multimodal Data Fusion
- Multimedia Verification
- Intelligent HCI

Information Technologies Institute (ITI)

iti Information Technologies Institute

> 650 people

7 labs in 2 units

http://www.iti.gr

Multimodal Data Fusion and Analytics Group (M4D)

MultiMoDal Data Fusion and Analytics Group

> 130 people involved

> 50+ active projects

> 300 publications

MultiMoDal Data Fusion and Analytics Group

Multimodal Data Fusion and Analytics Group

MultiMoDal Data Fusion and Analytics Group

Team

Head
- Dr. Stefanos Vrochidis

~130 people (researchers, post docs, research associates, developers)

Papers

30+ Journal publications

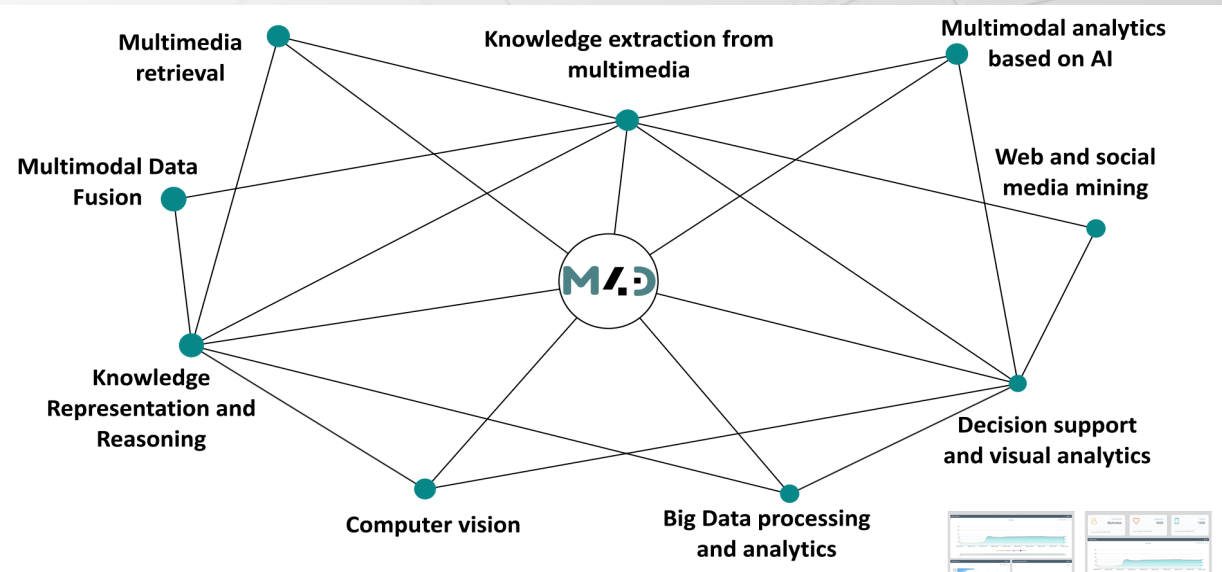
150+ conference publications

14 book chapters

50+ Research projects (H2020, National)

- H2020 SEC CONNEXIONs (CO)
- H2020 SEC beAWARE (CO)
- H2020 SEC TENSOR
- H2020 SEC aqua3S (CO)
- H2020 ICT SODALITE
- H2020 ICT V4Design (CO)
- H2020 ICT MindSpaces (CO)
- NATO VECTOR

Research directions



Arts & Creative industries & Media Cultural Heritage Environment Health Security Migration Defence Smart Manufacturing Software Infrastructure

Bringing the gap

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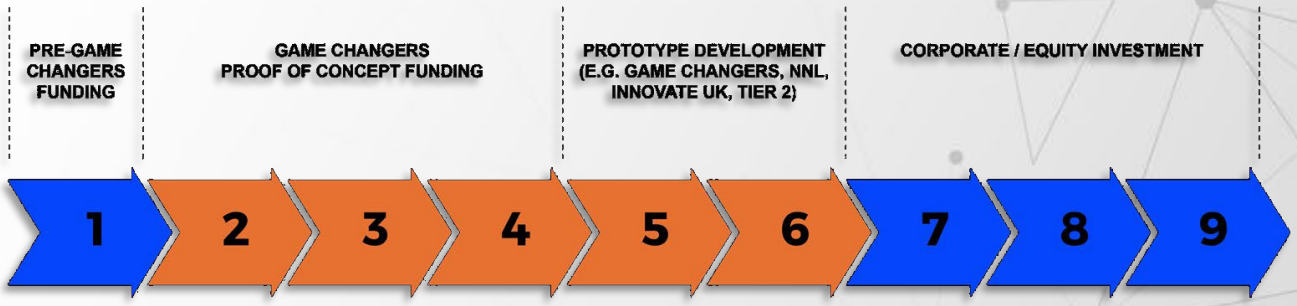
- **Most of the R&D projects deliver services and/or prototypes of Technology Readiness Level (TRL) ~6-7**
  - TRL 6: Technology demonstrated in **relevant** environment
  - TRL 7: System prototype **demonstration** in **operational** environment
  - TRL 8: System **complete** and qualified
  - TRL 9: Actual system **proven** in operational environment
- **Differences in technology maturity**
  - From TRL 6 to 7: Prototype demonstrated in operational environment (rather than relevant environment)
  - From TRL 7 to 8: System (and not prototype) operated in real relevant environments
  - From TRL 8 to 9: Actual execution in long lasting scenarios in operational environments



- **Additional EU funding opportunities for security**
  - BMVI, ISF

Border Manag ement and Visa Instrument (BMVI)

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- **BMVI's Objectives**
  - Support and effective European integrated border management at the external borders
  - Support common visa policy
- **Funded actions under BMVI**
  - Improving border controls
  - Funding efficient services to visa applicants
  - Investing in common large-scale IT systems in the area of borders management
  - Investing in infrastructure and equipment, systems and services, training, exchange of experts e.t.c
  - Providing operational support for the implementation of the European integrated border management and of the common visa policy
- **Successful innovation uptake examples in BMVI**
  - H2020 ROBORDER to BMVI Reaction

BMVI 2021 2027

ROBORDER technologies (Horizon Europe)

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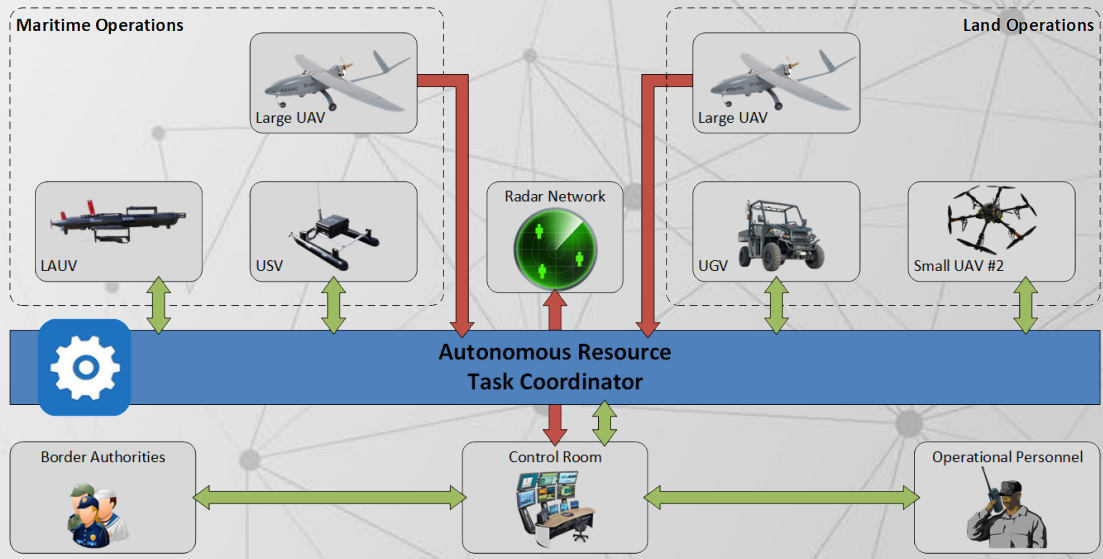
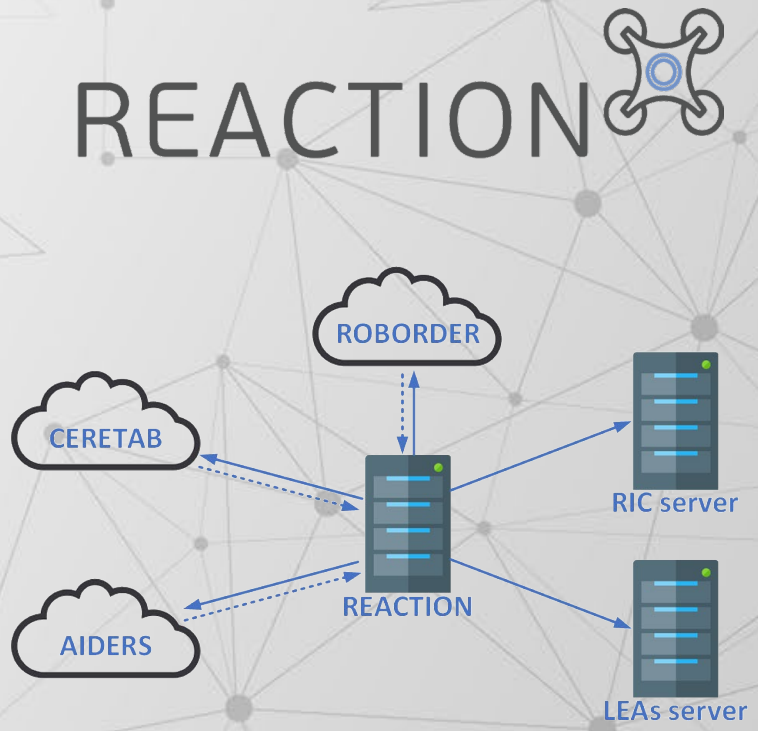
- **Heterogeneous data from several different sources**
  - Visual and thermal cameras
  - Unmanned Vehicles (air, ground, sea)
  - Radio-Frequency sensors
  - Radar-based networks
- **Cognition models providing an intelligence layer**
  - Highly-accurate detection models e.g., visual detections
  - Cyber and cyber-physical attacks
  - Unauthorized communications using RF sensor
- **Improved situational awareness**
  - AR/VR technologies
  - Simple mission allocator
  - CISE-compliant representations
  - Risk models and decision support

ROBORDER



Reaction technologies (BMVI)

- BMVI Specific Action Innovation for sea/shore, and/or land border surveillance (operational testing in pilot projects)
- ROBORDER technologies improved with CERETAB and AIDERS components
  - Adapt to different operational needs
  - Interoperate with existing infrastructure
  - Analyse multimodal sensing data
  - Compile the complete tactical picture
  - Support decision making for the operator's response
- Deliver a TRL 8 system
  - Reuse Innovation acquired from the previous projects
  - Incorporate AI techniques and highly mature models
  - Interoperable connection and information exchange
  - Large scale field exercises
  - Training sessions for relevant LEAs activities



Internal Security Funds (ISF)

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- **ISF's Objectives**
  - Increase the exchange of information among and within the EU law enforcement
  - Intensify cross-border cooperation, including joint operations, among and within the EU law enforcement
  - Support efforts to strengthen capabilities to combat and prevent crime, terrorism and radicalisation
- **Funded actions under ISF**
  - Purchase/procurement of ICT systems
  - Monitoring of the implementation of EU law and policy objectives
  - Implementing or facilitating the implementation of the EU Policy Cycle/EMPACT
  - Support to thematic or cross-theme networks
  - Education and training for relevant authorities and agencies
- **Successful innovation uptake examples in ISF**
  - H2020 CREST to ISF SAFEGUARD

CREST technologies (Horizon Europe)

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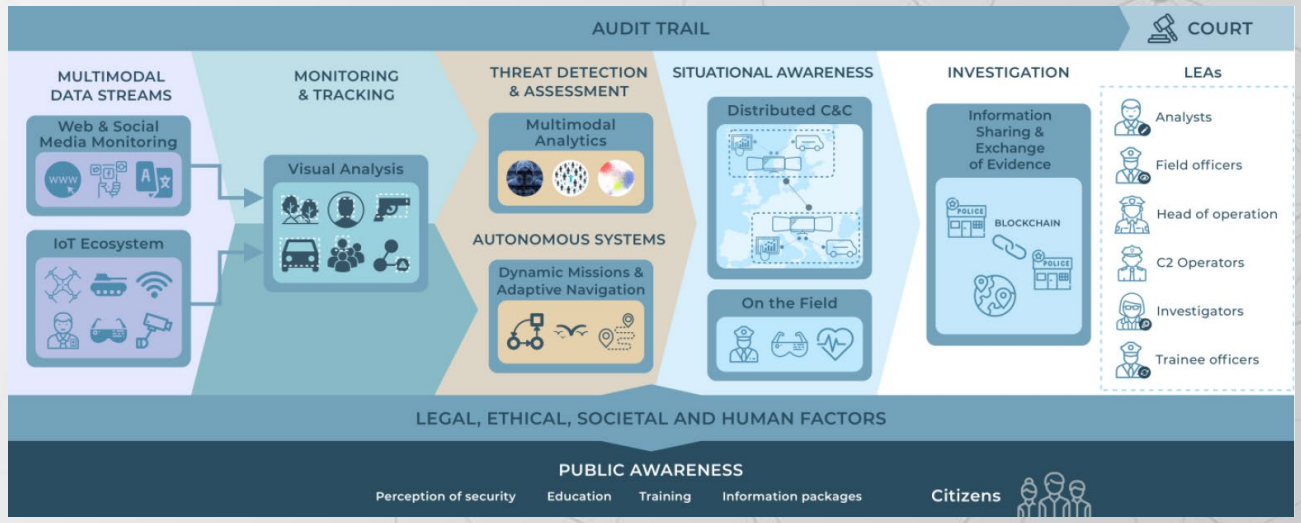
- **Multimodal data streams**
  - RGB and THz cameras
  - IoT-enabled devices
  - Unmanned Vehicles (air, ground)
  - Web and Social Media
- **Monitoring and tracking**
  - Visual analysis tools
- **Threat Detection and assessment**
  - Multimodal analytics
  - Cyber threat detection
- **Situational Awareness and Investigation**
  - Distributed planning and management capabilities
  - Secure information sharing and evidence exchange



SafeGuard technologies (ISF)

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- ISF Support for innovation and new technologies for the protection of public spaces - Innovation PPS II
- SafeGuard will extend developed technologies
  - Design, develop and support a system assisting LEAs in threat prevention and the protection
  - Improve intelligence gathering and situational awareness, i.e., online media analysis, visual analysis, AR/VR
  - Fuse information coming from different sources in a unified manner for threat assessment and early warning
  - Improve situational awareness for protecting critical infrastructures and mitigating cascading effects
  - Strengthen on-site and real-time monitoring event detection via on-board video analytics, object detection and tracking by using an Intelligent UAV Surveillance Platform (INUS) in indoor and/or outdoor environments
- Deliver a TRL 8 system
  - Reuse Innovation acquired from the previous projects
  - Incorporate AI techniques and algorithms
  - Deployment of tools systems and technologies for near real-time analysis
  - Large scale field exercises
  - Hands-on training sessions training activities to LEA

Opportunities

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- **Reuse knowledge from previous projects**
  - Exploit innovative technologies
  - Expand capabilities towards improved overall functionalities
- **Additional funding to increase technology maturity**
  - Extended validations under real conditions
  - Further testing under more operational scenarios
  - Training sessions so that relevant LEAs are familiarized with the technologies
  - Identify market uptakes

Challenges

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- **Different submission process (compared to Horizon)**
  - Submission through the Managing Authorities
  - New proposal templates
- **Difficulty in convincing the relevant authorities**
  - Due to luck of experience
  - Not so many success stories yet
- **Co-ordination among different countries**
  - National and Transnational Schemes
  - One project may be split into separate in different countries

THANKS!

Questions?

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