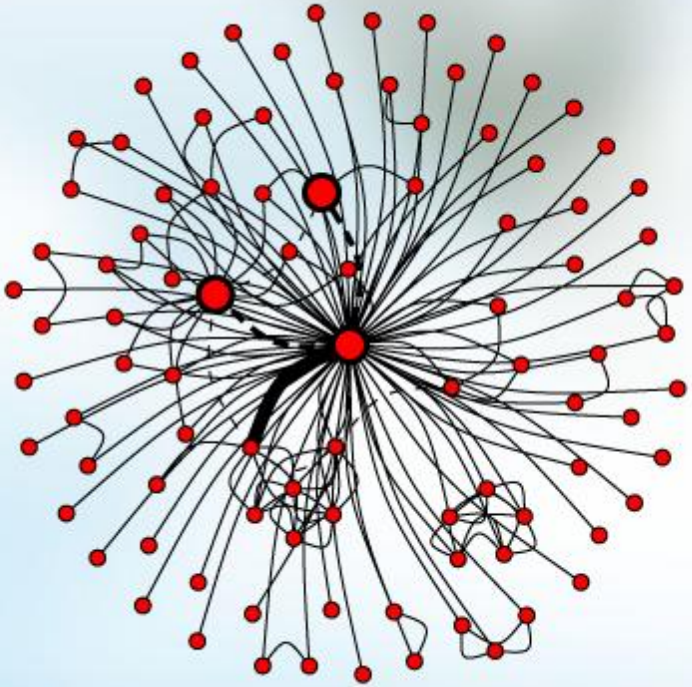
Multimedia Knowledge & Social Media Analytics Laboratory

The Lab has extensive experience and expertise in semantic multimedia analysis, indexing and retrieval, social media and big data analytics, knowledge structures, reasoning and personalization for multimedia applications, eHealth and environmental applications



Information Technologies Institute (ITI)
Centre for Research and Technology Hellas (CERTH)

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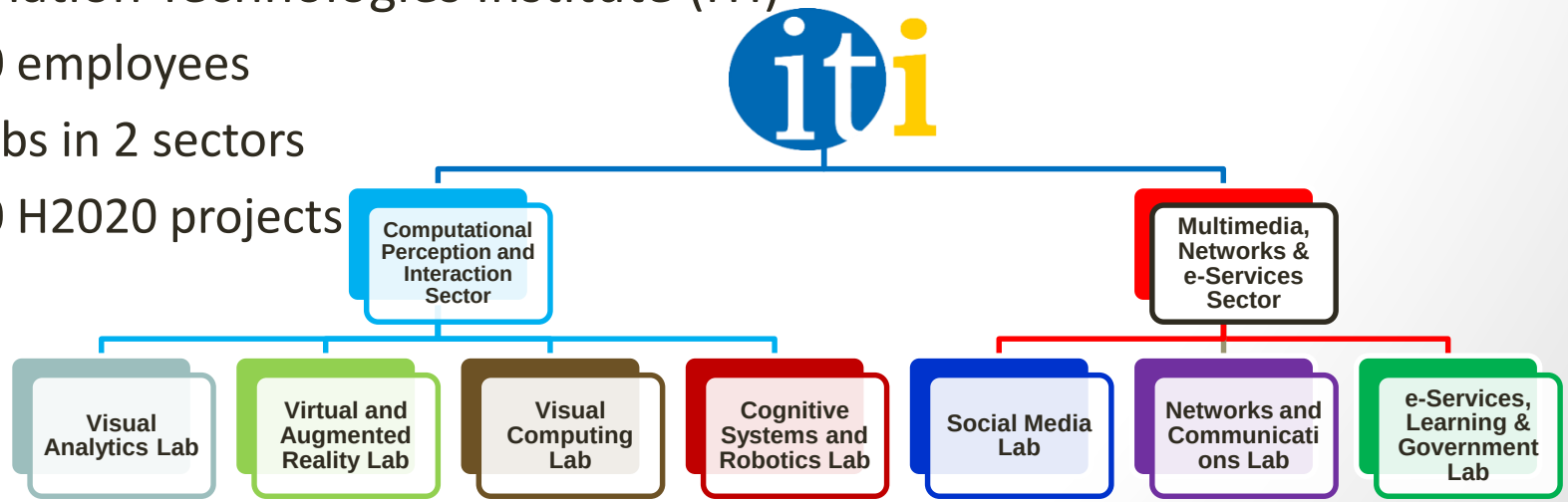
CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

Activity Group meeting (AG27),
Brussels, Belgium
June 20th

Centre for Research and Technology Hellas

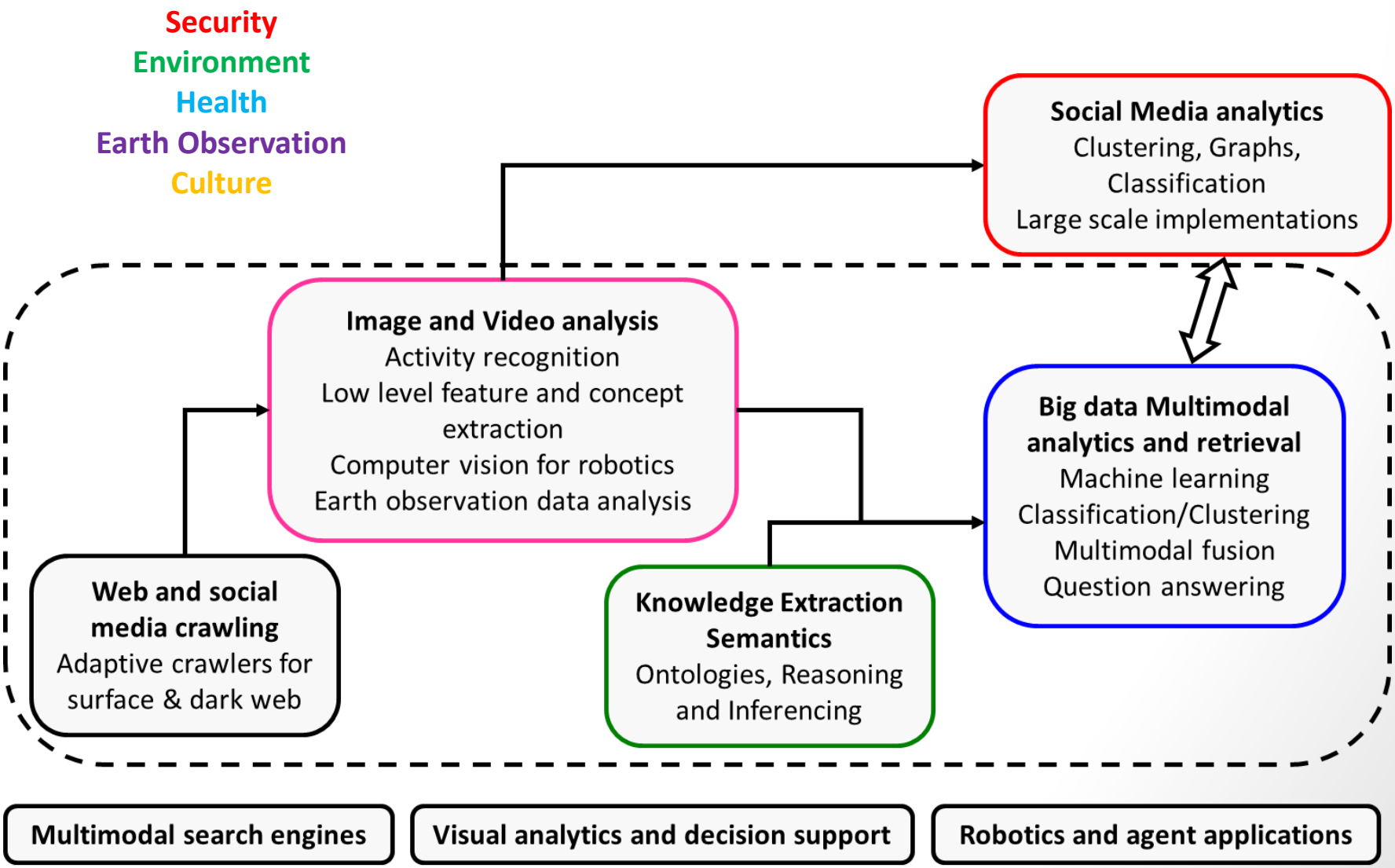
- Established in 2000
  - 5 institutes, >800 employees
  - 1200 projects, 1100 international collaborations in total
- Annual budget ~€30M:
- Among the **Top-10 EU institutions** in attracting competitive research projects
- Information Technologies Institute (ITI)
  - 300 employees
  - 7 labs in 2 sectors
  - 100 H2020 projects



Multimedia Knowledge & Social Media Analytics Lab (MKLab)

- Two tenured researchers:
  - Dr. Yiannis Kompatsiaris (head)
  - Dr. Vasileios Mezaris
- 20 post-doc researchers, 40 research assistants, 6 PhD candidates
- European and National Research Projects
  - Since 2003, the team has successfully been involved in 58 European and National research projects
  - 15 ongoing H2020 projects (+4 to begin in 2018), 4 coordinators
  - Research contracts from Motorola UK and US
- >500 publications in peer-reviewed venues (114 journals, 11 books, 38 book chapters, 400+ conference papers)
- Commercial exploitation:
  - 8 patents
  - INFALIA spin-off company (smart cities, data analytics) https://www.infalia.com/

Research Directions & Applications



Current European Projects of MKLab

MOVING (co-ordinator)
Training towards a society of data-savvy information professionals to enable open leadership innovation
H2020 RIA, 2016-2019

MULTIFORESEE
MULTI-modal Imaging of FOREnsic SciEnce Evidence - tools for Forensic Science
COST Action, 2017-2021

PROFIT
Promoting Financial Awareness and Stability
H2020 ICT, 2016-2018

ACTIVAGE
A European Multi Centric Large Scale Pilot on Smart Living Environments.
H2020-IOT-2016, 2017-2020

beAWARE (co-ordinator)
Enhancing decision support and management services in extreme weather climate events
H2020 DRS, 2017-2020

ChainReact (co-ordinator)
Making Supplier Networks Transparent, Understandable and Responsive
H2020 ICT RIA, 2016-2018

PROPHETS
Preventing Radicalisation Online through the Proliferation of Harmonised ToolkitS
H2020 RIA, FCT 2018-2021

ReTV
Enhancing and Re-Purposing TV Content for TransVector Engagement
H2020 RIA, 2018-2020

REVEAL
Social Media Verification
FP7 ICT IP, 2013-2016

CONNEXIONs
InterCONnected NEXt-Generation Immersive IoT Platform of Crime and Terrorism DetectiON, PredictiON, InvestigatiON, and PreventiON Services
H2020 RIA, FCT 2018-2021

CUTLER (co-ordinator)
Coastal Urban Development Through the Lenses of Resiliency
H2020 - CO-CREATION – 2018 –2020

DigiArt
The Internet Of Historical Things And Building New 3D Cultural Worlds
H2020 ICT RIA, 2015-2018

ROBORDER
Autonomous swarm of heterogenous robots for border surveillance
H2020-SEC-20-BES-2016, 2017-2020

STEP
SocieTal and political Engagement of young People in environmental issues
H2020 ICT, 2015-2018

SUITCEYES
Smart, User-friendly, Interactive, Tactual, Cognition-Enhancer that Yields Extended Sensosphere
H2020 ICT RIA 2018-2020

EMMA
Enriching market solutions for content management and publishing with state of the art multimedia analysis techniques
H2020 IA, 2017-2018

Envisage (co-ordinator)
ENhance VIrtual learning Spaces using Applied Gaming in Education
H2020 ICT IA, 2016 - 2018

EOPEN
Open interoperable platform for unified access and analysis of Earth Observation data
H2020 EO RIA, 2017-2020

TENSOR
reTriEval and aNalysis of heterogeneouS online content for TerrOrist activity Recognition
H2020 IA, 2016-2019

V4Design (co-ordinator)
Visual and textual content re-purposing FOR(4) architecture, Design and video virtual reality games
H2020, ICT, 2018-2020

WikiRate (co-ordinator)
Crowdsource Better Companies
FP7 ICT Call 10

hackAIR
Collective awareness platform for outdoor air pollution
H2020 ICT RIA, 2016-2018

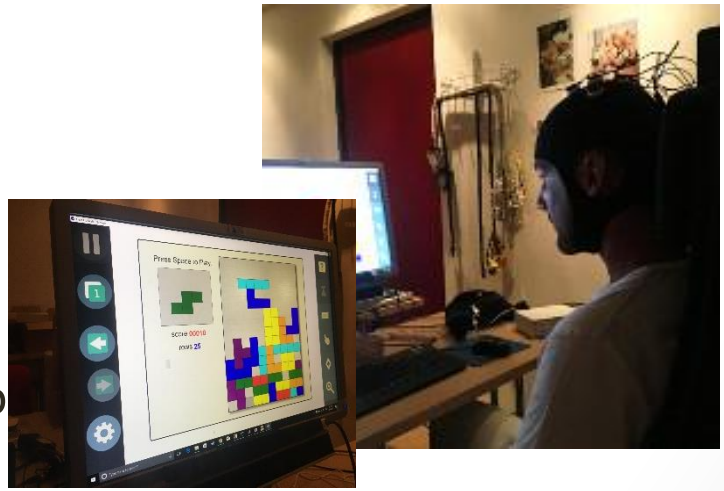
InVID (co-ordinator)
In Video Veritas - Verification of Social Media Video Content for the News Industry
H2020 ICT IA, 2016-2018

MAMEM (co-ordinator)
Multimedia Authoring and Management using your Eyes and Mind
H2020 ICT RIA, 2015-2018

AI technologies within MKLab

- Semantic content representation and reasoning
  - Context awareness and dialogue management to support human-like conversations and question answering
  - Sensor data fusion and activity detection for contextualised monitoring of human behavior to aggregate and interpret multimodal observations

- Brain models & interfaces
  - Mental task classification and brain-computer interfaces
  - Brain activity modelling
  - e-Health and clinical applicatio



KRISTINA

MAMEM

- Smart Homes & Ambient Intelligence and Ambient Assisted Living

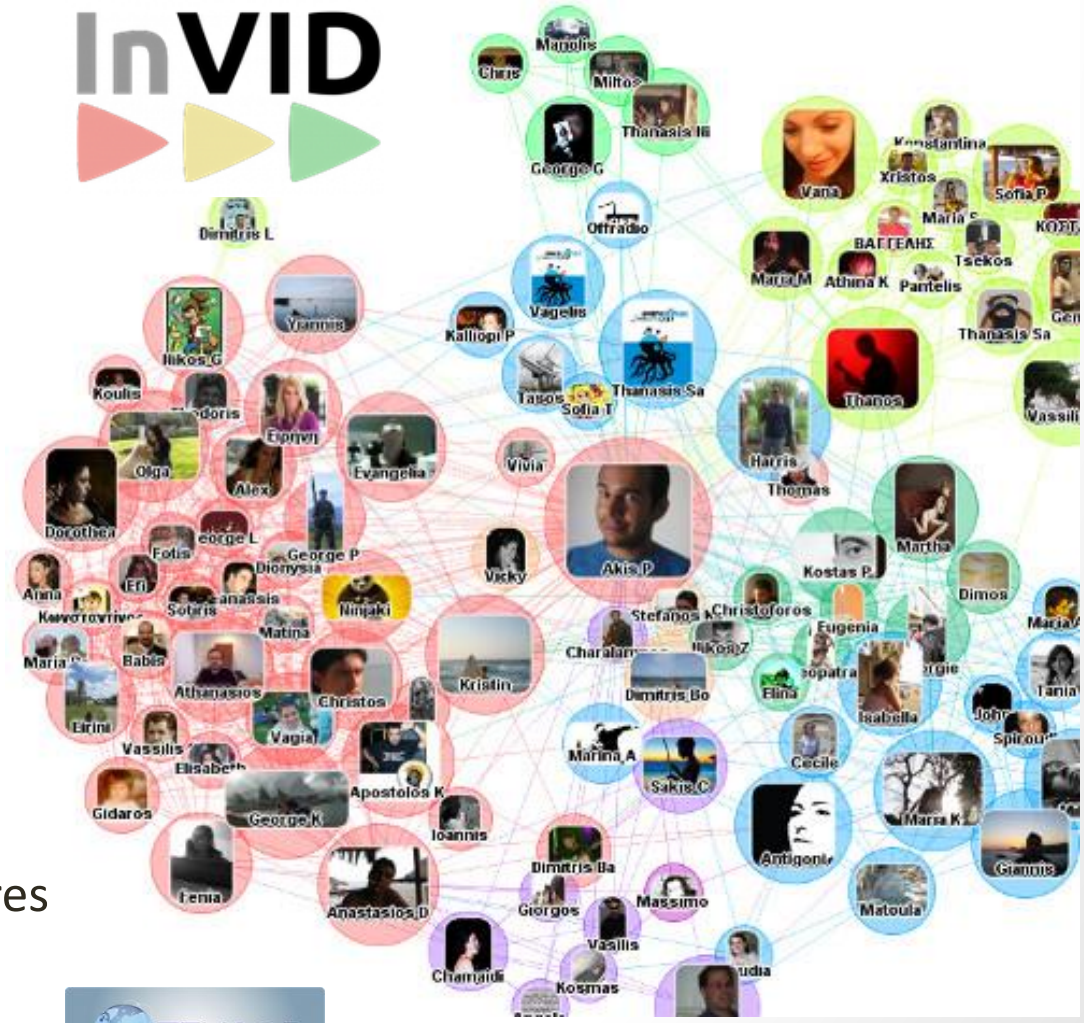
dem@care

AI technologies within MKLab

- Multimedia indexing and retrieval
  - Interactive video retrieval using compound multimodal queries
  - Hybrid recommender systems
- Decision support applications
  - Sensor data fusion from heterogeneous sources
  - Visual analytics for security, environmental and health applications
- Swarm Robotics for Surveillance
  - Object detection for surveillance
  - Sea pollution detection using satellite images
  - Multispectral image fusion using swarm optimization
- Earth Observation data analysis for environmental applications
  - Water body detection from series of satellite images
  - Knowledge extraction and fusion of EO, weather, and social media
  - Semantic representation and linking of open data

AI technologies within MKLab

- AI-based social media analysis
  - Online media monitoring and content discovery
  - Privacy-aware multimedia classification
  - Post and account classification
  - Concept extraction and event detection in monitoring social media
- Social network analysis
  - Complex network structures
  - Community detection and key-player identification



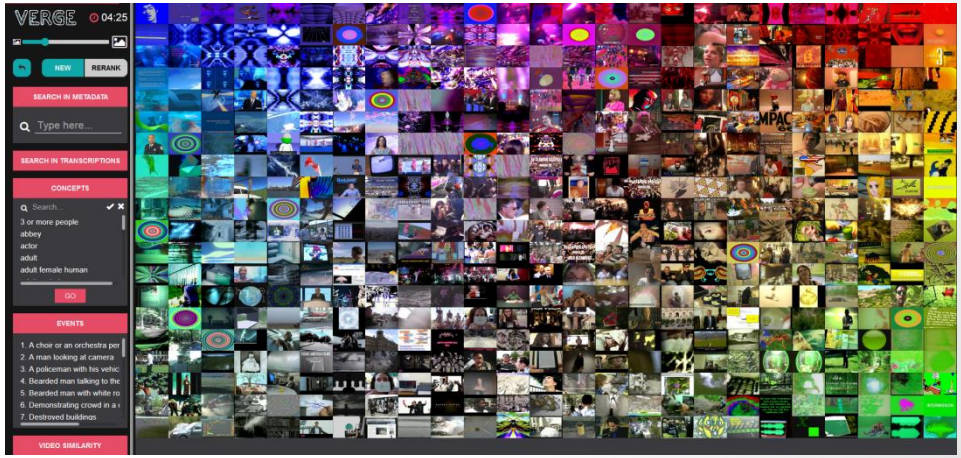
Key AI technologies within MKLab

- Computer Vision
  - Activity detection and recognition from videos
  - Feature extraction from multimedia using deep learning
  - 3D object classification
- Multimedia Search Engines heterogeneity, etc. (incl. multimedia, sensor, multispectral, EEG, etc.)
- Knowledge modeling and decision support (incl. user interfaces)
- Application development (ranging from sensor capturing, processing, AI, to end users) of any nature
- Data Analytics
- Multimodal fusion
- User interfaces

http://mklab.iti.gr/verge/

V4Design

DigiArt

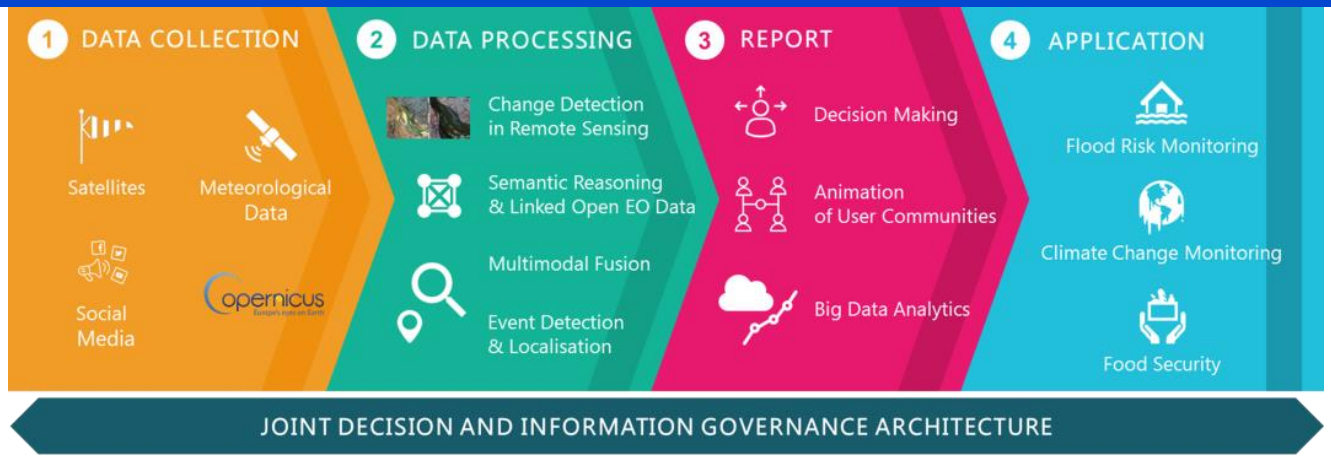


Key AI areas of research within MKLab

- Deep learning architectures (CNN, RNN, LSTM, etc.)
- Semantics through word embeddings
- Reinforcement learning
- Active learning
- Generative Adversarial Networks (GANs)
- FATML (Fair, Accountable and Transparent ML)
- AI for Social Good, Responsible AI

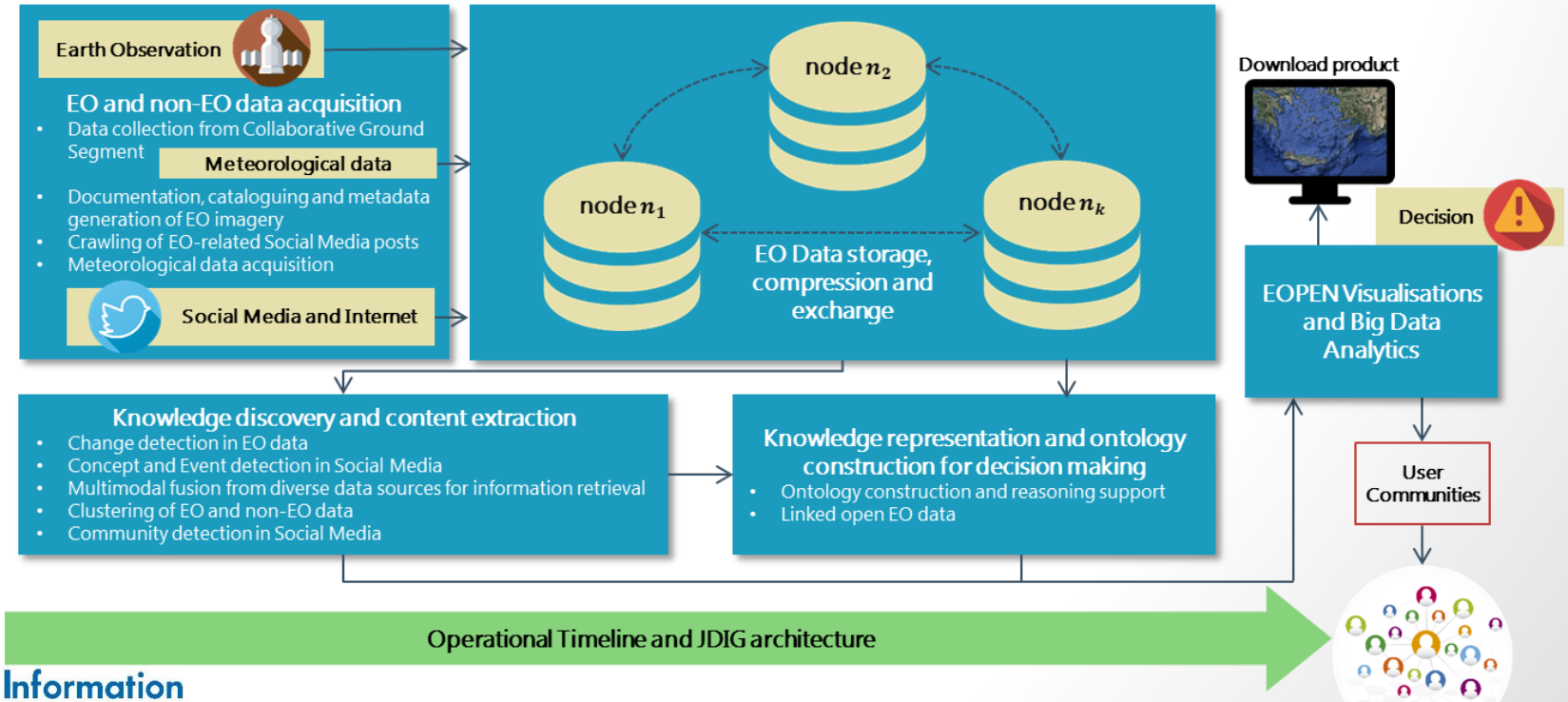
EOPEN: Open interoperable platform for unified access and analysis of Earth Observation data

Work programme : EO-2-2017: **EO Big Data Shift**



EOPEN website:
http://eopen-project.eu/
Follow us on Twitter:
@EOPEN_project

European Commission



Upcoming calls of our interest

- ICT-11-2018 (b) : HPC and Big Data enabled Large-scale Test-beds and Applications http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ict-11-2018-2019.html
  - Automotive industry and related applications
  - Cloud technologies and edge processing
  - Sensor data integration and IoT
- DT-ICT-11-2019: Big data solutions for energy http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/dt-ict-11-2019.html
  - Heavy industry (power plant constructors)
  - Electricity producers
  - Electricity grid operators
- DT-SPACE-01-EO-2019: Copernicus market uptake http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/dt-space-01-eo-2018-2020.html
  - Combine EO data with videos, images, social media weather and sensor data

Contact: Dr. Ilias Gialampoukidis (heliasgj@iti.gr)