





Support to AI part of <u>Digital Single Market Policy</u>

EC Communication Coordinated Plan on AI, Dec. 2018:

Investment in AI from H2020 in 2018-20: 1.5 B€:
 70% increase relative to period 2014-17
 Includes establishment of an AI on Demand Platform (2018) & AI Centers of

Investment in AI from Horizon Europe & Digital Europe in 2021-27: 1 B€ p.a.

Creating European Data Spaces

Excellence (present period)

- Nurturing talent, skills and life-long learning
- Developing ethical, trustworthy, human-centric AI





- 1. FET Open + FET Proactive 2020
- 2. ICT WP 2020 (5)
- 3. NMBP + Space 2020
- 4. Health 2020 (3)
- 5. Energy, Transport + Climate 2020
- 6. Security 2020 (4)

**Technology Development** 

**Technology Deployment** 



#### **FET OPEN OBJECTIVE**

- What is funded:
  - <u>Embodiment</u> of <u>novel ideas</u> into <u>radically new technologies</u>





#### **FET OPEN OBJECTIVE**

- Optimal project results:
  - Proof of concept of the proposed technology
  - Early lab demonstrator





#### FET OPEN GATEKEEPERS

Selection for funding is based on three *gatekeepers* = necessary features that any proposal with a chance to be funded has to have:

- The project must address a clear and <u>radical vision</u>, enabled by a <u>new technology concept</u>\* that challenges current paradigms
- 2. The project must target a novel and ambitious <u>science-to-technology</u> <u>breakthrough</u> as a first proof of concept for its vision
- 3. <u>Ambitious interdisciplinary</u> research for achieving the technological breakthrough and that <u>opens up new areas of investigation</u>

<sup>\*</sup> the theoretical knowledge might already exist



#### FET OPEN CALL PARAMETERS

#### **Future deadlines:**

Date	Budget	
18 Sept. 2019	160 M€	
13 May 2020	190 M€	

#### Evaluation criteria:

Criterion	Treshold	Weight
Excellence	4/5	60%
Impact	3.5/5	20%
Implementation	3/5	20%

Success rate: ~ 10% and rising ©

Past H2020 FET projects with AI component in cordis database: ~ 70 (20%)



#### **FETPROACT-EIC-05**

High-risk / high-reward R&I projects

With the objectives:

- to explore and <u>consolidate a new technological direction/paradigm</u>
- to foster the interdisciplinary communities that are able to drive this forward
- to foster <u>emergence of a broader R&I ecosystem</u> for the technology and its future uptake

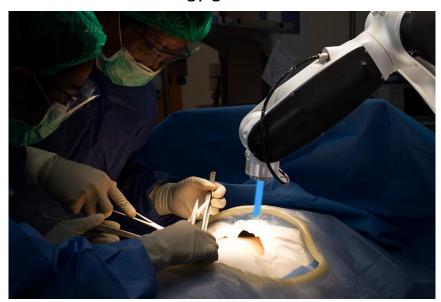
Broadly defined topics are developed in dialogue with stakeholders



#### **FETPROACT-EIC-05**

#### Topics open in 2019:

- Human-Centric AI
- Implantable autonomous devices and materials
- Breakthrough zero-emissions energy generation for full decarbonization





#### **HUMAN-CENTRIC AI**

Objectives: To advance AI with

- verifiable, evidence-based features of <u>trustworthiness</u> (i.e., reliable and unbiased alignment of values, goals and beliefs)
- transparency (explainable performance),
- exploring radically <u>new approaches</u> (e.g., inspired from neuro-science, cognition or social science)

New data collection and ownership/governance models that go beyond the dominant off-line and centralised data processing should be investigated

<u>New avenues</u>, such as for incremental, unsupervised, active, one-shot and 'small data' machine learning, should be explored

Contribution to the wider debate on sociotechnical, organisational and ethical dimensions



#### FET PROACTIVE CALL PARAMETERS

#### **Future Deadline**:

Date	Budget	
13 Nov. 2019	87,4 M€*	

#### **Evaluation criteria**:

Criterion	Treshold	Weight
Excellence	4/5	60%
Impact	3.5/5	20%
Implementation	3/5	20%

Past success rate: ~ 15%

<sup>\* =&</sup>gt; ca. 30 M€ for the AI topic



# PROJECTS UNDER <u>LEADERSHIP IN INDUSTRIAL TECHNOLOGIES</u> AND UNDER <u>SOCIETAL CHALLENGES</u>

Project type	Consortia	Maturity of outcomes	Funding rate	Evaluation tresholds	Score weighting
Research & Innovation Actions	Min. 3 partners from 3 MS/AC	TRL~5	100+25%	3/5	-
Innovation Actions	Min. 3 partners from 3 MS/AC	TRL 6/7	70/100+25%	3/5	Impact * 1.5
Coordination & Support Actions	Mostly 1 organisation suffices	-	100+25%	3/5	-





Project Type: Research & Innovation Action

Call Deadline: 13 Nov. 2019

• Call Budget: 48 M€

Project Budget: 12 M€

#### **Summary Topic content:**

- 4 networks will be selected, focusing on major S&T challenges (e.g. autonomous driving)
- networks will develop mechanisms to spread the knowledge to all AI labs in Europe, becoming one virtual reference lab
- each network will be driven by leading AI figures from major research centers
- they will cross-fertilize with industry via collaborative projects and staff exchange

(e.g. joint PhD programs)

 Topics for collaborative projects: Advances in AI foundations (reasoning), Trusted AI, Intelligent robots, Advanced perception and interaction, AI at the edge, AI HW

- Make Europe a research powerhouse for AI
- Increase Europe's attractiveness for scientists; prepare future generations of scientists and breakthrough in AI
- Strengthen the <u>AI-on-Demand platform</u> with algorithms and tools solutions
- Foster mobilization and commitment from the community





Project Type: <u>Coordination and Support Action</u>

Call Deadline: 13 Nov. 2019

Call Budget: 2 M€

Project Budget: 2 M€

#### **Summary Topic content:**

- Developing synergies and exchange between the selected projects, and with other relevant projects, such as the <u>AI-on-Demand platform</u>, and the community at large
- Supporting the projects in their dissemination activities towards industry, users, and citizens
- Organizing AI workshop and courses...
   ... to foster cooperation with industry

- Foster mobilization and commitment from the community,
- Reinforce Europe's research capacity in Al
- Enrich the education offer in order to equip non-ICT professionals with necessary AI skills



### **ICT-49-2020 ARTIFICIAL INTELLIGENCE ON DEMAND PLATFORM**

Project Type: Innovation Action

Call Deadline: 22 April 2020

Call Budget: 20 M€

Project Budget: 5 M€

#### **Summary Topic content:**

- Add-on to the existing AI4EU platform:
- Reinforcing the service layer of the platform to facilitate the use and uptake of the platform resources
- Reaching out to new user domains and boosting the use of the platform through use cases and small-scale experiments by 3<sup>rd</sup> parties (≤ 200 k€ per party)

- Particular attention shall be paid to SMEs and low-tech sector
- Coverage of a wide spread of application sectors shall demonstrate the versatility and scalability of the platform offer
- Provide a good European coverage, both in terms origin of the resources and of the users
- The improvements resulting from the selected projects should be made available via AI4EU

- Enriching and optimising the AI4EU platform service offer and reinforcing its <u>sustainability</u>
- Boosting the deployment of AI-based solutions and services



#### **ICT-38-2020 ARTIFICIAL INTELLIGENCE FOR MANUFACTURING**

Project Type: Research & Innovation Action

Call Deadline: 16 Jan. 2020

Call Budget: 47 M€

Project Budget: 4-6 M€

#### **Summary Topic content:**

- Integrating state-of-the-art AI technologies in the manufacturing domain:
- esp. in <u>agile production</u> processes and <u>predictive quality</u>,
- taking into account aspects such as time criticality, safety and security,
- finding effective ways for collaboration between humans and AI systems
- Benefits of manufacturer in focus

- Products and services usable in a wide range of manufacturing processes leading to agile production processes and improved quality of products and processes
- Humans working together with AI systems in optimal complementarity
- Proposals need to provide metrics, the baseline and targets to measure impact



#### **ICT-38-2020 ARTIFICIAL INTELLIGENCE FOR MANUFACTURING**

Project Type: Coordination & Support Action

Call Deadline: 16 Jan. 2020

Call Budget: 1 M€

Project Budget: 0,5 M€

#### **Summary Topic content:**

- <u>Standardisation</u>: implementation of a model for the synchronisation of standardisation activities on AI and related digital technologies in manufacturing (national, EU, global)
- <u>Cooperation EU-Japan</u>: assessing opportunities, organising contacts, twinning with entities participating in Japanese projects

#### **Summary Expected Impact:**

Increased synchronisation and cooperation globally

### ICT-51-2020 BIG DATA TECHNOLOGIES AND EXTREME-SCALE ANALYTICS



Project Type: Research and Innovation Action

• Call Deadline: 16 Jan. 2020

• Call Budget: 30 M€

Project Budget: 3-6 M€

#### **Summary Topic content:**

Continuation of topic ICT-12-2018

Proposals should develop methodologies & solutions at least one of the following areas:

- ML/DL (esp. on distributed data sets), architectures for collecting, managing and exploiting vast amounts of data;
- system engineering/tools to contribute to the co-design of federated/distributed systems;
- new methods for extreme-scale analytics, deep analysis, precise predictions and

automated decision-making;

- novel visualization techniques;
- data fusion and data integration technologies;
- standardized interconnection methods for efficient sharing of heterogeneous data pools, seamlessly using distributed tools and services

- Increased productivity and quality of system design and SW development thanks to better methods, architectures and tools
- Significant increase of speed of data throughput and access
- Adoption of results of the extreme-scale analysis and prediction in decision-making





Project Type: Coordination and Support Action

Call Deadline: 16 Jan. 2020

Call Budget: 1,5 M€

Project Budget: 1,5 M€

#### **Summary Topic content:**

 Coordinating existing and emerging activities in HPC/BD/Cloud/AI technologies, incl. national initiatives and the European Network of National Big Data Centers of Excellence, www.big-data-network.eu

- Effective cooperation of the participating initiatives and platforms
- Smooth transition to Horizon Europe activities



#### DT-ICT-12-2020 AI FOR THE SMART HOSPITAL OF THE FUTURE

Project Type: Innovation Action

Call Deadline: 22 April 2020

• Call Budget: 40 M€

Project Budget: 7-10 M€

#### **Summary Topic content:**

- Use of innovative AI based systems (robotics, big data, machine learning, autonomous systems, conversational agents, etc.) depends on successful integration and acceptation within existing health and care facilities
- Devise in-facility pilot demonstrators:
- Pilots need to be embedded in operational health and care settings and built around well specified open physical and digital platforms
- They may address any aspect of health facility

- operations such as diagnostics, treatments, logistical aspects etc.
- They shall demonstrate the integration of autonomous smart components unpinning Al that physically affect the working environment
- They shall demonstrate operational and economic benefits to health care policy makers

- Emergence of European-led AI based pilots for the smart hospital
- Demonstration of effectiveness of AI based technologies
- Effective basis for developing deployable applications...

## DT-SPIRE-11 ARTIFICIAL INTELLIGENCE AND BIG DATA TECHNOLOGIES FOR PROCESS INDUSTRIES

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Project Type: <u>Coordination and Support Action</u>

Call Deadline: 5 Feb. 2020

Call Budget: 0,6 M€

Project Budget: 0,6 M€

#### **Summary Topic content:**

- Developing a <u>roadmap for all the different</u> <u>sectors</u> in the process industries to take full advantage of AI and Big Data exploring:
- R&I management, planning, and design (e.g. new chemical synthesis strategies, health and safety assessments)
- Process control: yield and accuracy enhancement

- Supply chain management and scheduling of connected processes, plants and/or sites (e.g. for industrial symbiosis), process flexibility;
- Predictive maintenance
- Product customisation and/or traceability

- Better exploitation of AI potential for all the different sectors
- Identification of existing and future data requirements for the development of data driven technologies
- Seamless collaboration of human operators with process control systems

## DT-SPACE-25-EO BIG DATA TECHNOLOGIES AND ARTIFICIAL







Project Type: Research and Innovation Action

**INTELLIGENCE FOR COPERNICUS** 

Call Deadline: 5 March 2020

Call Budget: 10 M€

Project Budget: 2-4 M€

#### **Summary Topic content:**

- Developing <u>Big Data technologies and</u>
   analytics, and <u>AI methodologies for industrial</u>
   requirements and/or societal challenges with
   Copernicus Earth observation data
- Projects can address individual elements of the Copernicus data value chain or the value chain as a whole
- End user involvement shall drive the research
- Using existing European data infrastructures

- Increased capacity of processing and analysing large volumes of Copernicus data, with powerful tools that demonstrate their applicability in real-world settings;
- Increased performance and/or automation of processes involving the processing of Copernicus data;
- Enhanced, innovative applications to support the Copernicus DIAS platforms;
- Demonstrated adoption of results of the Copernicus data analysis in decision-making (in industry and/or society).

# SC1-DTH-02 PERSONALISED EARLY RISK PREDICTION, PREVENTION AND INTERVENTION BASED ON ARTIFICIAL

INTELLIGENCE AND BIG DATA TECHNOLOGIES

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Project Type: <u>Research and Innovation Action</u>

Call Deadline: 22 April 2020

Call Budget: 32 M€

Project Budget: 4-6 M€

#### **Summary Topic content:**

- Developing and validating <u>early-risk prediction</u> <u>models and solutions</u> based on AI or other state of the art technologies:
- Addressing one or multiple conditions and ways of inducing adequate personalised preventive measures (e.g. behavioural change, diet, interventions, medication, primary prevention) from advanced predictive models
- Include actions aimed at increasing <u>health</u> <u>literacy</u> of citizens as well as "digital" literacy

of health professionals

- Include <u>validation/proof of concept</u> and feasibility demonstration
- <u>No</u> large scale piloting or clinical trials
- Build on project results from PHC-21-2015

- Evidence of the benefits of delivering adequate information regarding personalised risk prediction, prevention and intervention,
- Improvements of outcomes for individuals, care systems and wider society from prevention measures and interventions
- Realise large-scale collection of usergenerated data...



# SC1-DTH-12 USE OF REAL-WORLD DATA TO ADVANCE RESEARCH ON THE MANAGEMENT OF COMPLEX CHRONIC CONDITIONS



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Project Type: <u>Research and Innovation Action</u>

Call Deadline: 7 April 2020

Call Budget: 41 M€

Project Budget: 4-6 M€

#### **Summary Topic content:**

- <u>Clinical research</u> integrating Real World Data (RWD) from clinical practice or from patient's daily life and linking them with data from clinical studies
- Use of <u>new technologies for data analytics</u> and interpretation such as Artificial Intelligence and computer modelling encouraged
- Research on rare and/or infectious diseases not eligible

- Demonstrate the potential of the use multidisciplinary multi-source RWD to advance clinical research on complex chronic conditions
- Advance the understanding of management of complex diseases including the interdependence of co-morbidities
- Further development of new technological tools and platforms for advanced data management...

## SC1-BHC-06 DIGITAL DIAGNOSTICS – DEVELOPING TOOLS FOR SUPPORTING CLINICAL DECISIONS BY INTEGRATING



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VARIOUS DIAGNOSTIC DATA

Project Type: Research and Innovation Action

Call Deadline: 7 April 2020

Call Budget: 40 M€

Project Budget: 8-15 M€

#### **Summary Topic content:**

- Develop tools, platforms or services that use information from most relevant diagnostic means, resulting in accurate assessment of patient health
- Solutions shall utilize various data sources: medical records, in vitro and in vivo diagnostics, medical imaging, functional tests (lab-on-a-chip)

- taking into account of needs of practitioners and future deployment
- tested in real-life settings in pilot centers
- focused on solutions toward concrete patient
- addressing ethical and legal concerns...

- Creating tool that helps clinicians to make decisions, to have systematic view of patients
- High project budget => large applications/platforms are expected!





• Project Type: Innovation Action

Call Deadline: 15 Jan. 2020

• Call Budget: 12 M€

Project Budget: 3,5-4 M€

#### **Summary Topic content:**

- Large-scale pilot test-beds for Big Data application in buildings:
  - Define a <u>reference data architecture</u>
     that's modular in order to accommodate
     data from various sources, allows
     integration with legacy architectures,
     encourages replication and scale-up...
  - Develop and pilot an open, cloud-based data analytics toolbox that processes big and diverse data sets and performs

Statistical Analysis, Data Visualisation, Business Intelligence and Predictive Modelling, supporting 3<sup>rd</sup> party development...

- Significant and measureable contribution to standardisation of European buildings data
- Demonstrated interoperability with data hubs at national or supranational level
- Creation of new data-driven business models and opportunities and innovative energy services
- Better availability of big data and big data analysis facilities for real-life scale research simulation and policy-making...

## MG-2-11 NETWORK AND TRAFFIC MANAGEMENT FOR

**FUTURE MOBILITY** 

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Project Type: Research and Innovation Action

Call Deadline: 9 Jan. 2020 (2<sup>nd</sup> stage 8 Sept. 2020)

Call Budget: 20 M€

Project Budget: 4-5 M€

#### **Summary Topic content:**

- Analyse the requirements for next-generation multi-modal network and traffic management capability, integrating smart infrastructure as well as connected automated vehicles
- <u>Design an architecture</u> for an efficient, resilient and adaptable multi-modal network and traffic management system, using innovative data collection/fusion techniques

- <u>Develop tools</u> for dynamic transport demand management and dynamic transport supply optimization
- <u>Design and calibrate arbitration models</u> for complex network and traffic management scenarios and multi-actor settings...

- Accelerate the transition towards connected and automated mobility
- Facilitate the integration of transport modes into a multimodal network
- Reduce capacity bottlenecks and traffic jams
- Improve safety and security in transport
- Reduce the cost of mobility

# LC-CLA-12 ADVANCING CLIMATE SERVICES, b) DETECTION AND ATTRIBUTION OF EXTREME EVENTS





#### USING ARTIFICIAL INTELLIGENCE

- Project Type: <u>Research and Innovation Action</u>
- Call Deadline: 13 Feb 2020 (2<sup>nd</sup> stage 3 Sept 2020)
- Call Budget: 22 M€ for all three subparts
- Project Budget: 4-6 M€

#### **Summary Topic content:**

- Explore <u>novel approaches for detection and localisation of extreme events</u> and for quantifying extreme events trends in current day and future climate change scenarios.
- Develop <u>AI techniques to detect spatial and temporal patterns</u> and evolutions of climatological fields (e.g., temperature) associated with extreme events.

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- These techniques should be capable of discriminating between different variables based on the event type and capable of handling events at various spatial scales.
- Consideration should be given to associated impacts and attribution to climate change.
- Actions could take advantage of data provided by the Copernicus program.

- Enhanced adaptive capacity;
- Reduced vulnerability to climate change
- Strengthened scientific knowledge on climate

# SU-AI01 DEVELOPING A RESEARCH ROADMAP REGARDING ARTIFICIAL INTELLIGENCE IN SUPPORT OF LAW ENFORCEMENT





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Project Type: <u>Coordination and Support Action</u>

Call Deadline: 27 Aug. 2020

• Call Budget: 1,5 M€

Project Budget: 1,5 M€

#### **Summary Topic content:**

- Providing <u>AI roadmap</u> for Law Enforcement Agencies (LEAs), meeting their specific operational and cooperation needs
- Involvement of ≥ 3 LEAs from 3 MS/AC mandatory

- Identification of key areas in which AI would be beneficial for LEAs and in which it could pose a threat to security;
- A roadmap in order for LEAs to benefit as much as possible from the AI based technologies, systems, solutions, including their protection;
- Increased awareness regarding the state of the art and trends in Al-based criminal activities

# SU-AI02 SECURE AND RESILIENT AI TECHNOLOGIES IN SUPPORT OF LAW ENFORCEMENT AND CITIZEN PROTECTION, CYBER-SECURITY OPERATIONS, AND PREVENTION AND PROTECTION





AGAINST ADVERSARIAL AI jeannette.klonk@ffg.at

Project Type: <u>Innovation Action</u>

• Call Deadline: 27 Aug. 2020

Call Budget: 17 M€

Project Budget: 17 M€

#### **Summary Topic content:**

- Exploring use of AI in the security dimension at and beyond the state-of-the-art, and exploiting its potential to support LEAs:
  - <u>develop AI tools</u> in support of LEAs daily work combining SW & HW solutions
  - <u>develop cybersecurity tools</u> for the protection of AI based technologies against manipulation & cyber threats

exploit AI technologies for cybersecurity

operation purposes of LEA infrastructures

- tackle <u>resilience against adversarial AI</u>, and prevention and protection against malicious use of AI...
- Involvement of ≥ <u>5 LEAs</u> from 5 MS/AC mandatory

- Develop a high-quality multilingual and multimodal training and testing dataset
- Improved capabilities for LEAs to conduct investigations and analysis using AI
- Ameliorated protection and robustness of Al based technologies against cyber threats.

# SU-AI03 HUMAN FACTORS, AND ETHICAL, SOCIETAL, LEGAL AND ORGANISATIONAL ASPECTS OF USING AI IN SUPPORT OF LAW ENFORCEMENT





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Project Type: <u>Coordination and Support Action</u>

Call Deadline: 27 Aug. 2020

Call Budget: 1,5 M€

Project Budget: 1,5 M€

#### **Summary Topic content:**

- Exhaustive <u>analysis</u> of human, social and organisational aspects related to the use of AI tools in support of Law Enforcement, both for cybersecurity and in the fight against crime
- Suggesting <u>approaches</u> to overcome these concerns and that stimulate the acceptance of Al tools by civil society and by LEAs
- Involvement of ≥ 3 LEAs from 3 MS/AC mandatory

- Improved and consolidated knowledge among LEA officers
- Exchange of experiences among LEAs
- Raised awareness of civil society...

## **SU-DS02 INTELLIGENT SECURITY AND PRIVACY MANAGEMENT**





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Project Type: <u>Innovation Action</u>

Call Deadline: 27 Aug. 2020

Call Budget: 18 M€

Project Budget: 2-5 M€

#### **Summary Topic content:**

- a. <u>Dynamic governance, risk management and compliance</u>: develop and integrate automated, dynamic and adaptive approaches to security and privacy management
- b. Cyber-threat information sharing and analytics: develop and test threat detection frameworks...

 Foresee actions to collaborate with the pilots for a Cybersecurity Competence Network and similar projects

- Reduced number and impact of cybersecurity incidents
- Effective and timely co-operation and information sharing
- •

### **SU-DS02 INTELLIGENT SECURITY AND PRIVACY MANAGEMENT**





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Project Type: Research and Innovation Action

Call Deadline: 27 Aug. 2020

Call Budget: 20 M€

Project Budget: 2-5/6 M€

#### **Summary Topic content:**

- c. Advanced security and privacy solutions for end users or SW developers: automated tools for checking the security and privacy of data, systems, online services and applications
- <u>Distributed trust management and digital</u>
   <u>identity solutions</u>: approaches addressing
   both: distributed, dynamic and automated

trust management and recovery solutions; and management of the identity of persons and/or objects

 Foresee actions to collaborate with the pilots for a Cybersecurity Competence Network and similar projects

- Reduced number and impact of cybersecurity incidents
- Availability of comprehensive, resourceefficient, and flexible security analytics and threat intelligence
- ...



#### **SUMMARY**

- EU Investment in AI via the above 19 calls: 400-450 M€
- FFG H2020 web page: www.ffg.at/europa/Al
- Binding info: Funding & Tenders Portal:

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/h2020



#### **FURTHER EVENTS**

• "ICT Proposers Day", 19-20.09.2019 Helsinki:

https://ec.europa.eu/digital-single-market/en/news/digital-excellence-forum-ict-proposers-day-2019

• "ICT Ausschreibungen 2019/20", 10.10.2019 FFG Vienna:

https://www.ffg.at/europa/veranstaltungen/H2020-ICTcalls2019ff 2019-10-10

Workshop "Al in Law Enforcement", 20.11.2019 Paris:

https://en.milipol.com/Events/Workshops-H2020





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