

GREAT *for* **PARTNERSHIP**

BRITAIN & NORTHERN IRELAND



British Embassy
Rome



UK Science
& Innovation
Network

Workshop AI and Future Society
Villa Wolkonsky Rome 21/2/2019

The Role of Research

The Italian Laboratory for
Artificial Intelligence and Intelligent Systems
by the «**Consorzio Interuniversitario Nazionale in Informatica**»



Artificial
Intelligence
and
Intelligent
Systems
CINI National Lab



Prof. Rita Cucchiara
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Director of the Lab CINI AIIS

Artificial Intelligence R&D



John McCarthy (1955):

The aim of AI is to develop machines that behave as if they were intelligent.

Elaine Rich: (in “ Artificial Intelligence” 1983)

Artificial Intelligence is the study of how to make computers do things at which, at the moment, people are better.

UK White Paper of Artificial Intelligence 2018 (Oxford Living Dictionary)

Artificial Intelligence : the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

“AI for Europe” Communication From The Commission To The European Parliament (2018)

Artificial intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals.

AI-based systems can be purely software-based, ...or AI can be embedded in hardware devices (e.g. advanced robots, autonomous cars, drones or Internet of Things applications).

From JRC 2018

A view in Europe..
Research in the last 8 years

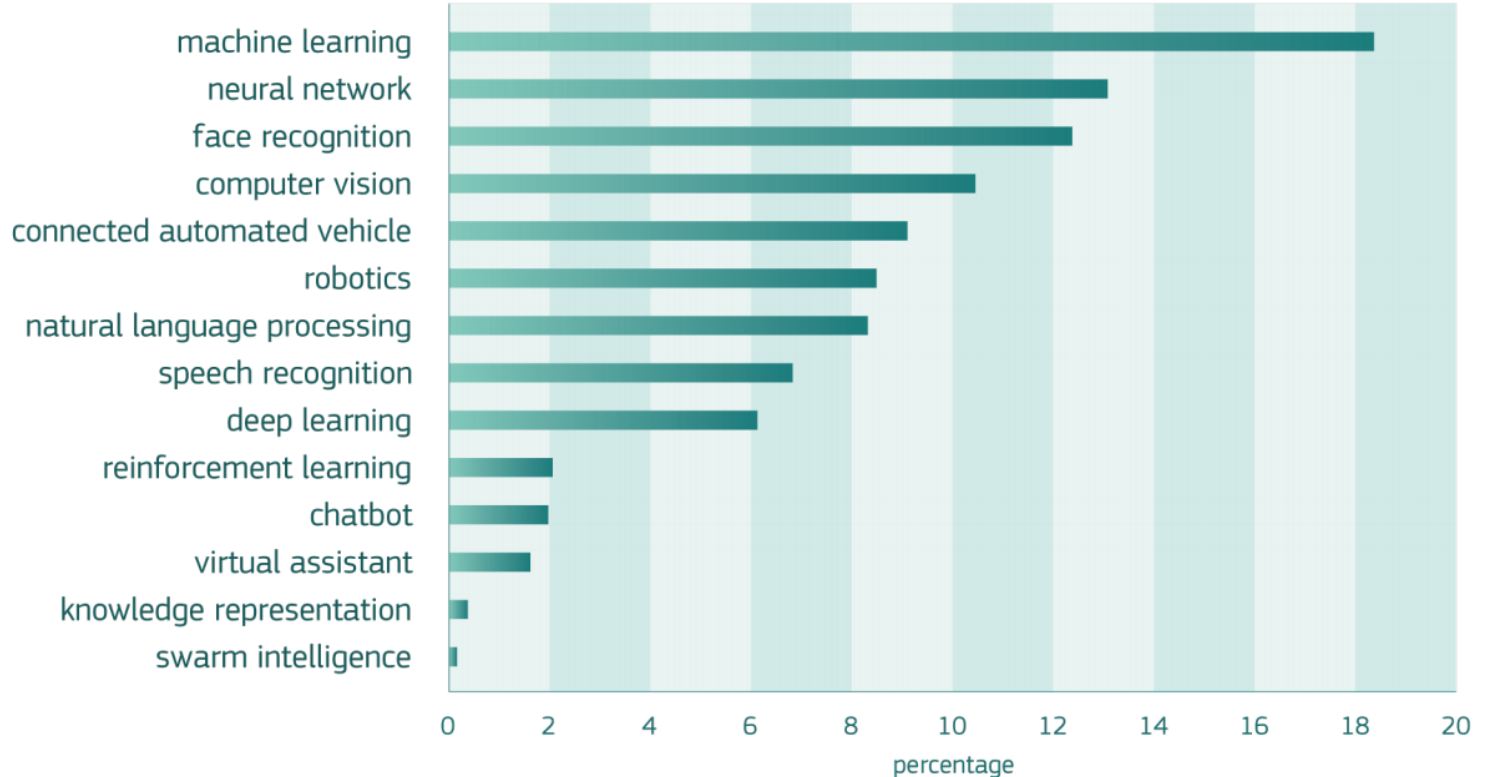
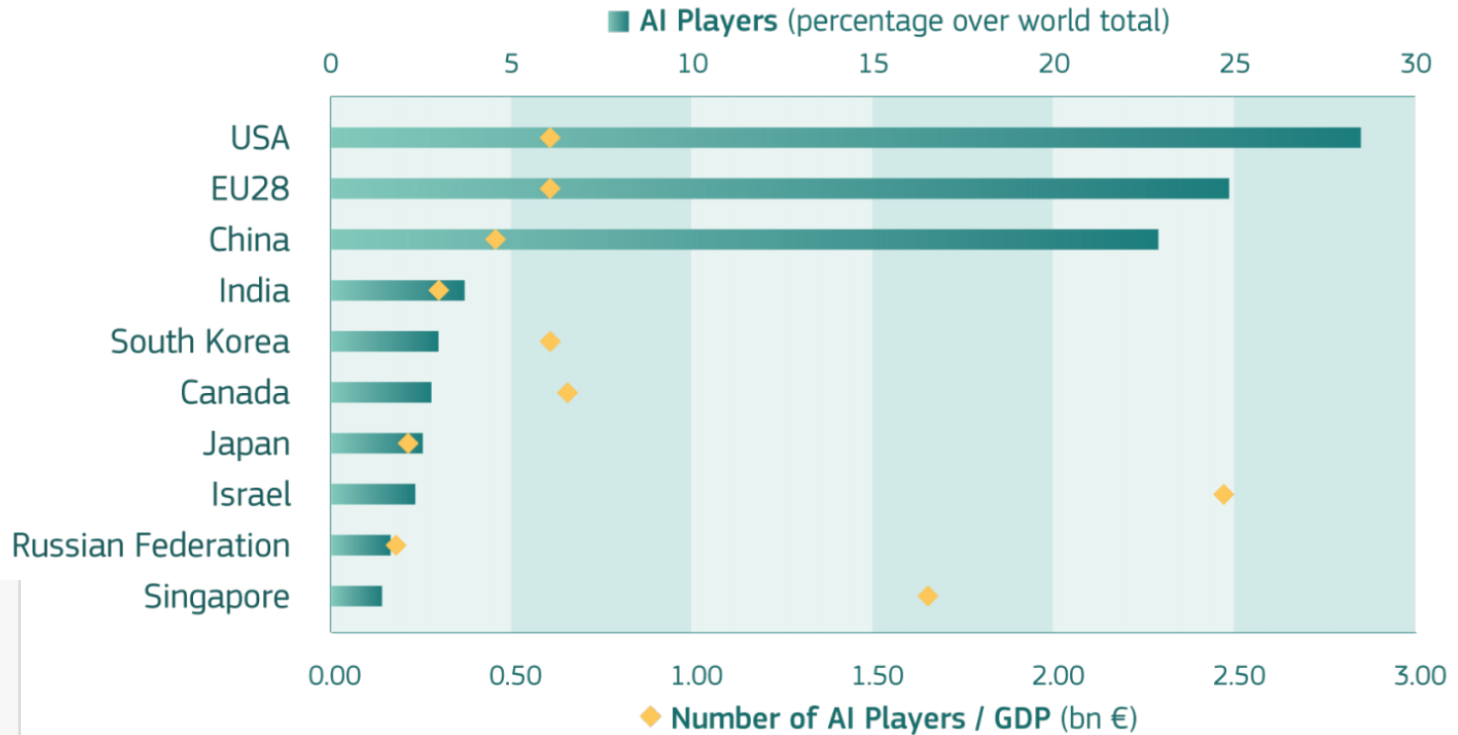


Figure 2. Percentage of AI players detected by the most representative keywords (2000-18)

“AI Players” in the world and GDP

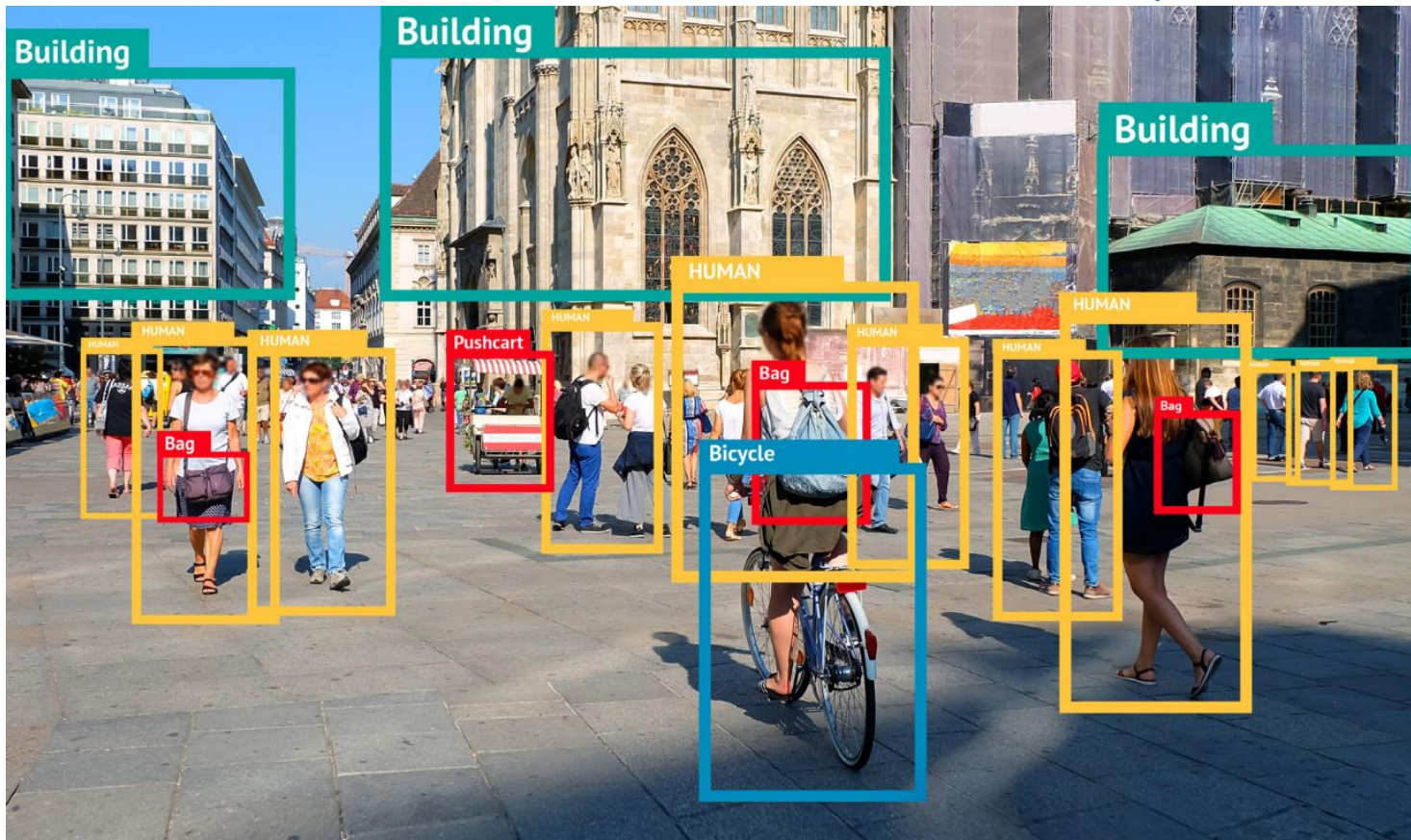


Research in the world



Learning to see from human suggestion

Neural Network and
computer vision in
supervised learning
(by human
annotation)



Learnig to see Humans

- Oxford University
- VGGFace2 3million faces
[Int conf FG2018]
- VoxCelebrity 1 million voice clips
[Interspeech2018]



Learning to see as humans do

Neural networks
trained to behave as a
person looking around
(on the left) or
looking at the road for
driving (in the right)

Dr(EYE)ve
[TPAMI 2018]



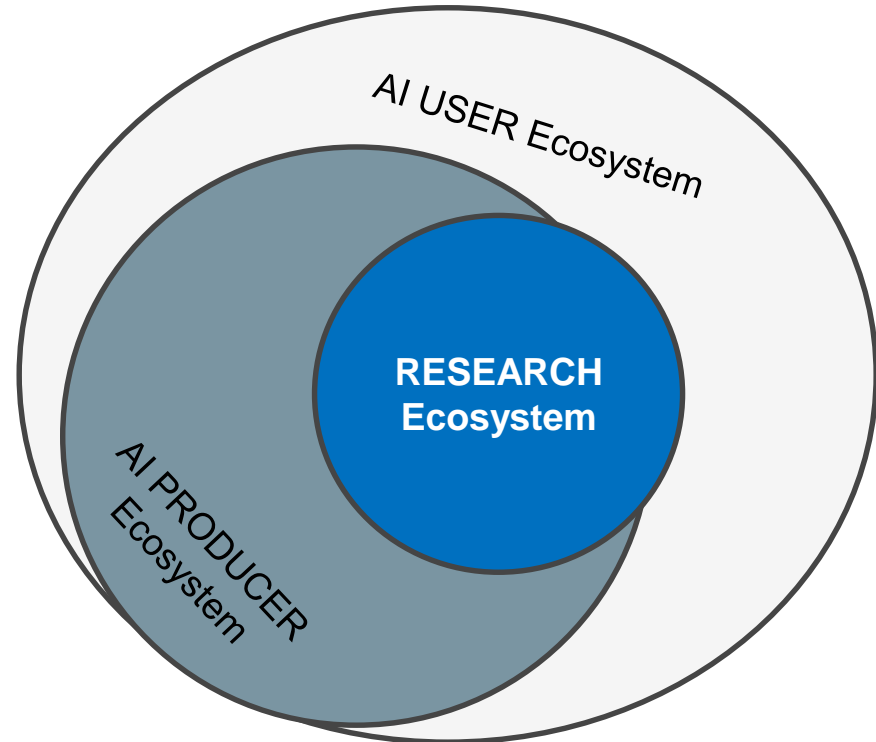
Bottom-up saliency



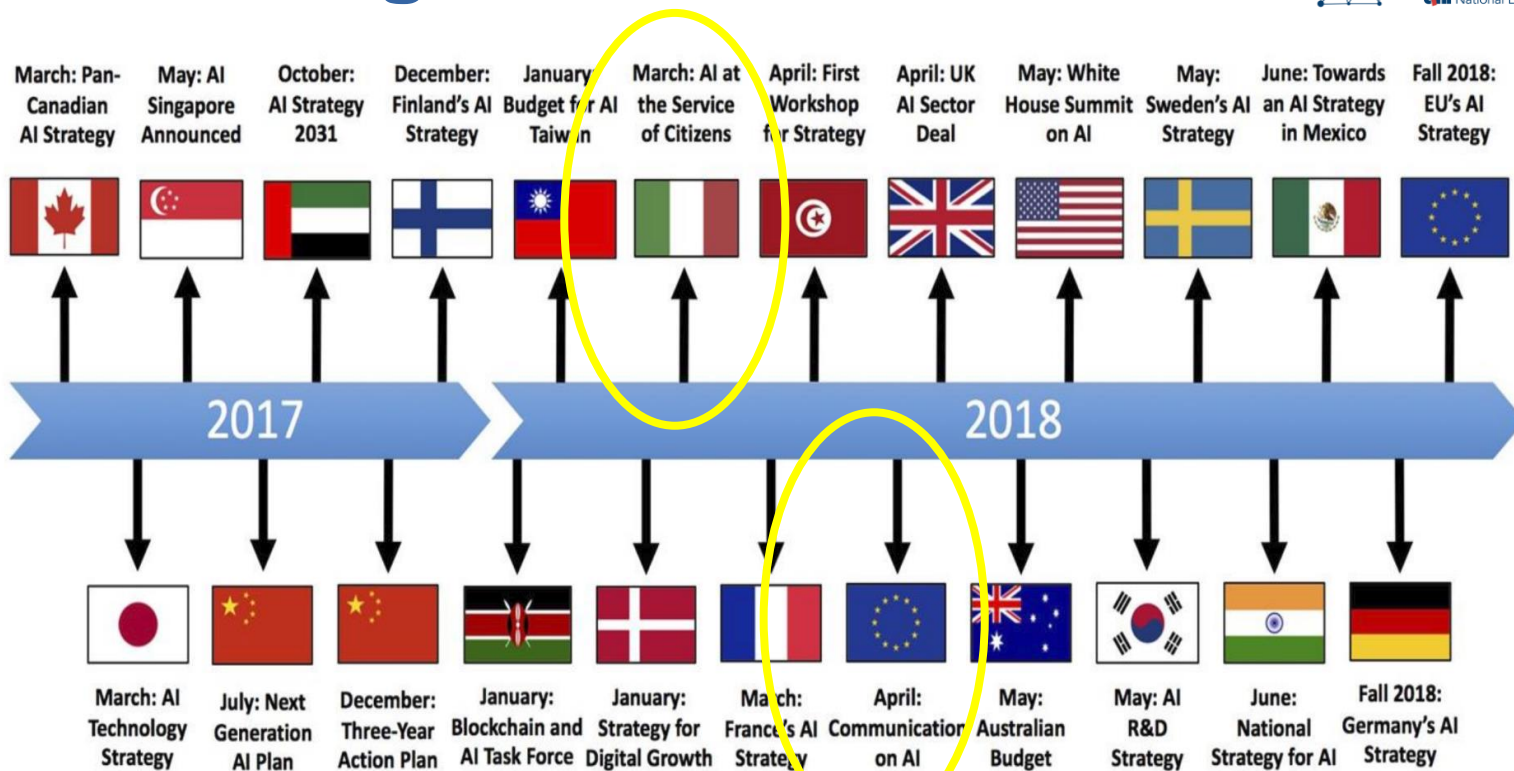
Task-driven saliency

The Role of Research in AI

- Very high level Research in Europe... but more AI research than AI industries
- The need of National strategies
- The need of National “critical mass”
- The need of inter-national collaborations
- The need of connecting
 - RESEARCH Ecosystem
 - AI PRODUCER Ecosystem
 - AI USER Ecosystems



2017-2018: AI strategies



AI in Italy...

- 
- 2017: AGID (Agency for Digital Italy) Task Force on AI
 - 2018: AGID *white paper* on AI for Public Administration
 - 2018 April: signed EU Declaration of Cooperation “AI for Europe”
 - 2018, June: **National Lab CINI AIIS**
for Artificial Intelligence and Intelligent Systems
Endorsed by the Presidency of the Ministry Council



National CINI Lab AIIS: mission

- To **strengthen Italian research** in all topics of AI and intelligent systems
- To **strengthen Italy's role in the world**, and in particular in the AI challenges, according to European principles
- To **strengthen the Italian industry**, for the adoption of the AI in all industrial sectors, innovating IT industries, support SMEs and startup and **for the creation of AI**
- To **contribute to the AI adoption in the PA**
- To **contribute to national security** through new AI technologies
- To contribute to the Italian society: supporting the many **social challenges, such as medicine, health, fashion, well-being, education, smart cities, digital humanities...**
- To new visions of the AI, not only technology-based: by promoting awareness campaigns on **ethical aspects, human rights, privacy and data management in human-centric AI**

National CINI Lab AIS: activities

- 2018 First collection of **Survey-AI** (~ 600 members)
- Support for Italian Initiatives in EU (**FET Flagship HumanEAI e Robotics**)
- Support to Eu initiatives
 - **CLAIRE**
 - **ELLIS**
- **International Meetings** (Bruxelles, Israel, Dubai-EAU, Paris, London, ..)
- **2018 New Research projects and collaborations within the Lab**
 - With RFI Anomaly detection by visions and sensors in railways
 - With Notary for document analysis
 - With Presidency of Ministry Council
 - With Israel : Join LAB for AI in Cultural Heritage
 - With UK (we hope 😊)
 - EU Project under submission
- The first Congress **in Rome Ital- IA 18-19 March 2019**, (Prof. Nardi- La Sapienza)
- Collaboration as expert groups **with MISE and MIUR** (Italian Ministry of Economic Development and Ministry of Education, University and Research)



Open call for contributions
till Friday 22

Ital-IA

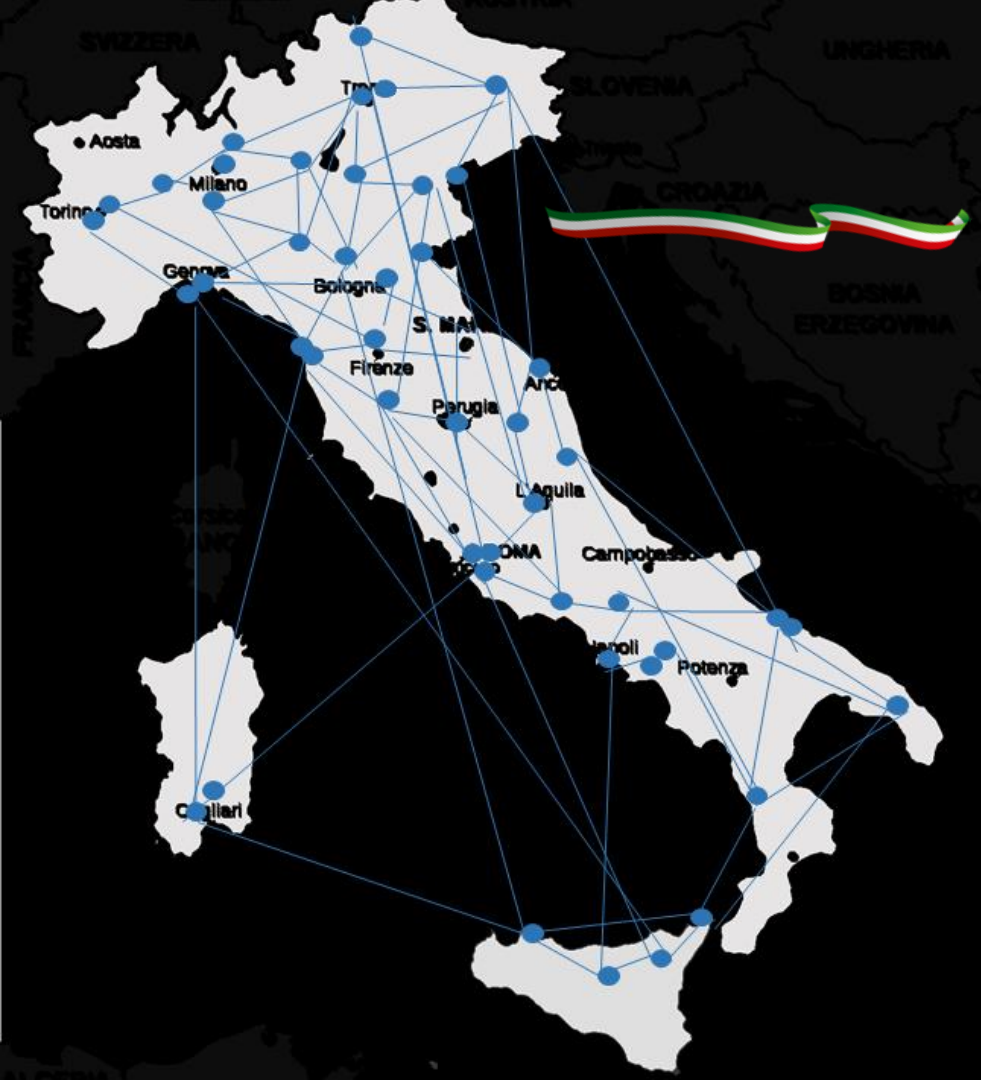
Convegno Nazionale CINI sull'Intelligenza Artificiale

Roma, 18-19 Marzo 2019



Benvenuto a Ital-IA 2019!

News



Lab CINI AIIS

(December 2018)

- 53 nodes
 - 49 nodes in 46 universities
 - 4 nodes in 3 Centri (CNR; FBK; IIT)
- **More than 882 members**

Italy	Nodes	Members
North	19	339
Centre	11	99
South	19	237
National Centers	4	207

The Nodes of Lab CINI AIIS (Dic. 2018)



Referente

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Università degli Studi di Roma "Tor Vergata"
Università degli Studi di Salerno - Dipartimento di Informatica
Università degli Studi di Salerno - Nodo AI3S
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Università degli Studi di Udine
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Università del Salento
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Università della Calabria – Dip. Ing.
Università di Pisa

Referente

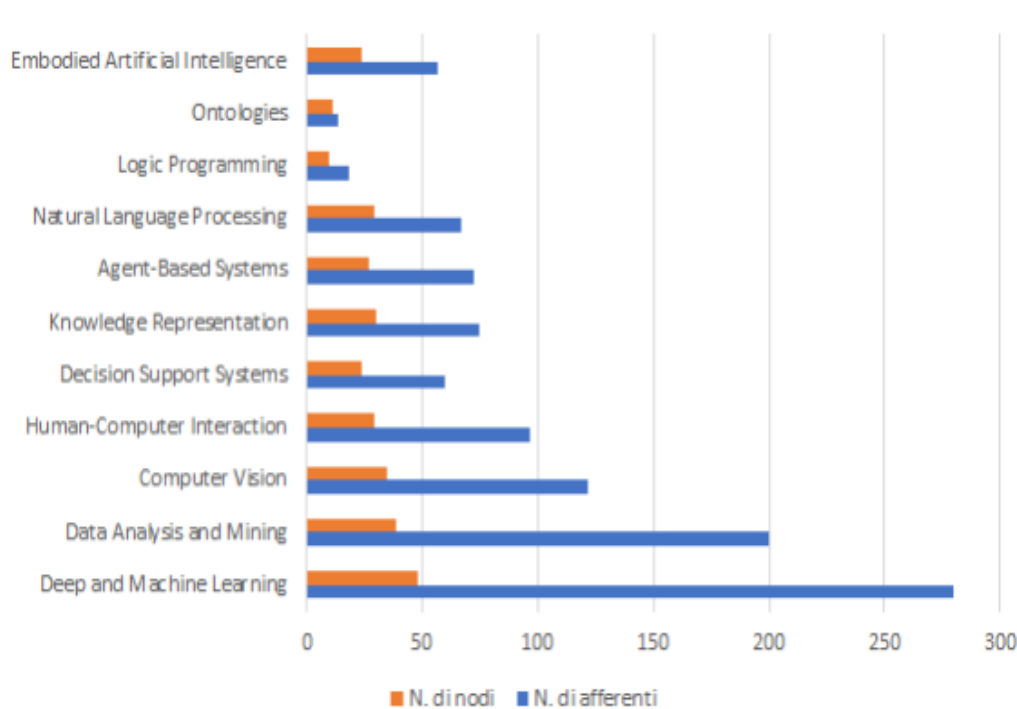
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Università o Centro di Ricerca

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Consiglio Nazionale delle Ricerche (CNR) - DIITET
Fondazione Bruno Kessler (FBK)
Istituto Italiano di Tecnologia (IIT)
Libera Università di Bolzano
Politecnico di Bari
Politecnico di Milano
Politecnico di Torino
Scuola Superiore Sant'Anna
Università Ca' Foscari Venezia
Università Politecnica delle Marche
Università degli Studi Roma Tre
Università degli Studi del Piemonte Orientale
Università degli Studi del Sannio
Università degli Studi dell'Aquila
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Università degli Studi di Cagliari – Dip. Mat.
Università degli Studi di Camerino
Università degli Studi di Cassino e del Lazio Meridionale
Università degli Studi di Catania
Università degli Studi di Enna "Kore"
Università degli Studi di Ferrara
Università degli Studi di Firenze
Università degli Studi di Genova

National Survey Lab AIIS : topics (draft)

Topic (Cluster)	members	nodes
Deep and Machine Learning	280	48
Data Analysis and Mining	200	39
Computer Vision	122	35
Human-Computer Interaction	97	29
Decision Support Systems	60	24
Knowledge Representation	75	30
Agent-Based Systems	72	27
Natural Language Processing	67	29
Logic Programming	18	10
Ontologies	14	11
Embodied Artificial Intelligence	57	24



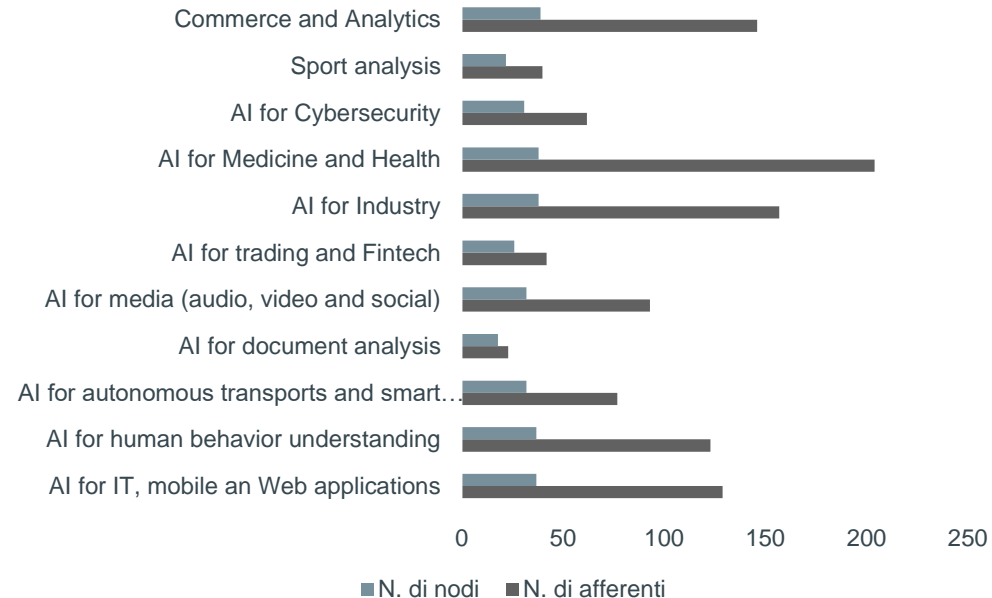
Methodology:

Clustering more than 500 keywords by machine learning based on word2vec + k-means with <5% post-processing

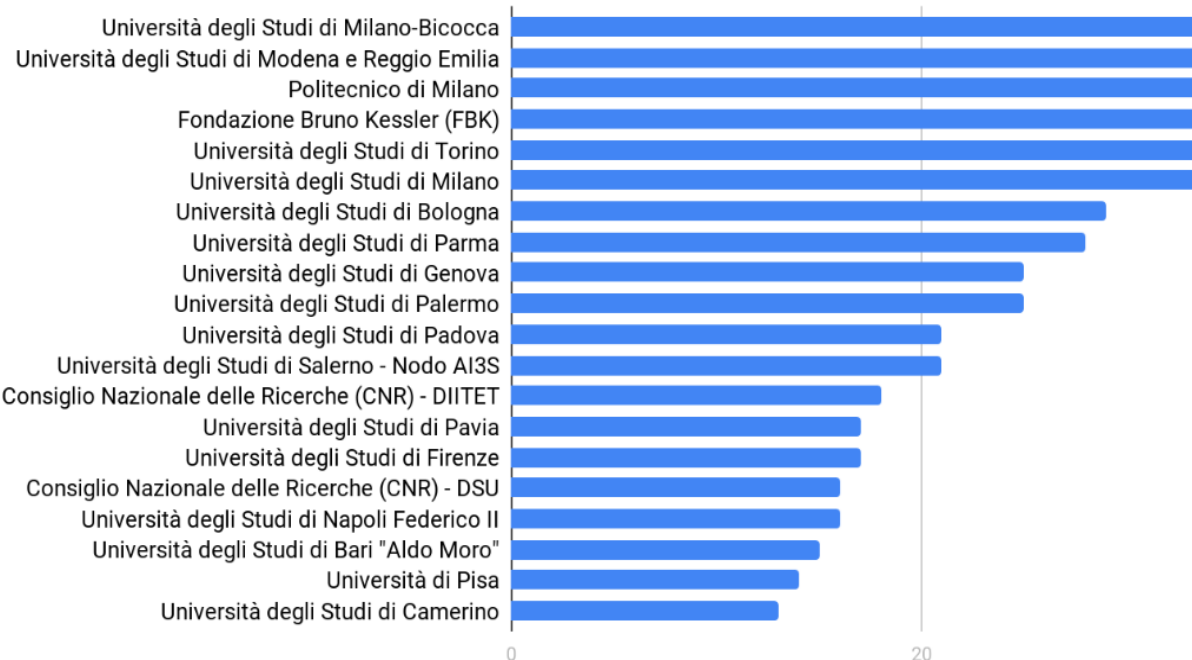
National Survey Lab AIIS : Applications (draft)

Applications (Clustered)	Members	Nodes
AI for IT, mobile an Web applications	129	37
AI for human behavior understanding	123	37
AI for autonomous transports and smart cities	77	32
AI for document analysis	23	18
AI for media (audio, video and social)	93	32
AI for trading and Fintech	42	26
AI for Industry	157	38
AI for Medicine and Health	204	38
AI for Cybersecurity	62	31
Sport analysis	40	22
Commerce and Analytics	146	39

AI Applications

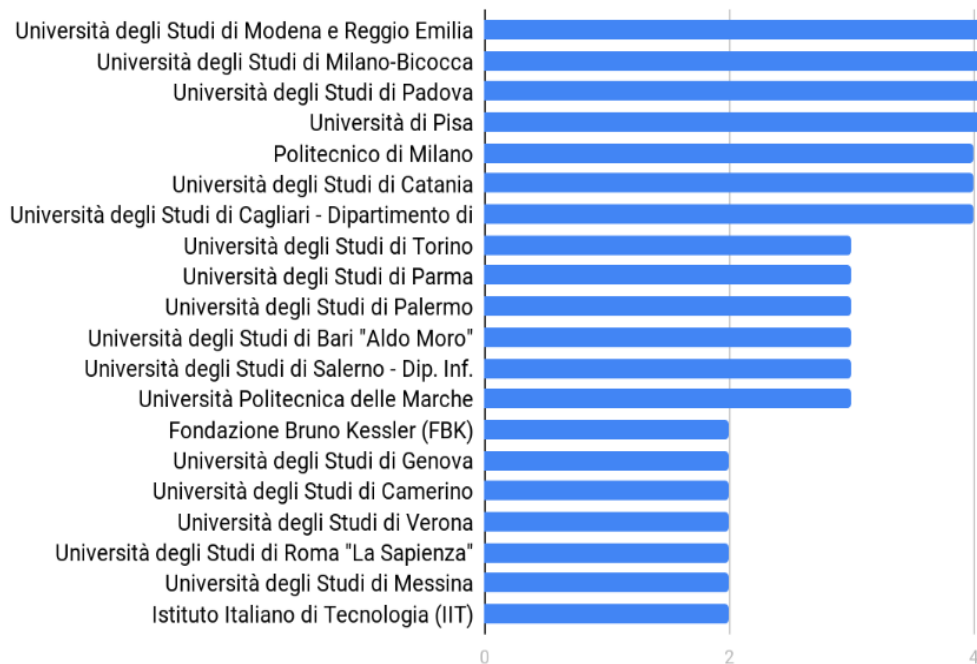


National Survey Lab AIIIS : projects



Topic	Members	Lab	Projects
Deep and Machine Learning	280	48	209
Data Analysis and Mining	200	39	203
Computer Vision	122	35	132
Human-Computer Interaction	97	29	55
Decision Support Systems	60	24	36
Knowledge Representation	75	30	48
Agent-Based Systems	72	27	65
Natural Language Processing	67	29	60
Logic Programming	18	10	2
Ontologies	14	11	7
Embodied Artificial Intelligence	57	24	45

Spinoff in nodes (80 spinoffs in survey)



Topics (multiple keywords)	members	spinoff
Deep and Machine Learning	280	34
Data Analysis and Mining	200	18
Computer Vision	122	12
Human-Computer Interaction	97	16
Knowledge Representation	60	4
Agent-Based Systems	75	3
Natural Language Processing	72	9
Logic Programming	67	1
Embodied Artificial Intelligence	18	4

Some examples of AI International Projects



AI4EU Horizon2020 (Thales with **CNR, LA Sapienza, UNIME, UNIBO...**)

Humane AI - FET Flagship Project Proposal (**CNR, FBK...**)

Prystine Ecsel2020 (Maserati, **UNIMORE, POLITO..**)

SPECIAL specialprivacy.eu (Ercim, **Federico II**)

DeepHealth Horizon2020 (Barcelona SCC, **Unito, UNIMORE**)

AI4CH Italy-Israel (**CINI-FBK, UNITN, UNIMORE**, Haifa, Technion)

ELEXIS Lexicograph (**ROMA La Sapienza**)

OPRECOMPS Transprecision cOmputing (**UNIBO**)

ARS – ErC Autonomous Robotic Surgery (**UNIVR**)

QUARZ Quantum Computer Horizon2020 (**UNIPD**)

... (a not-exhaustive list)

Some AI Italy-UK collaborations

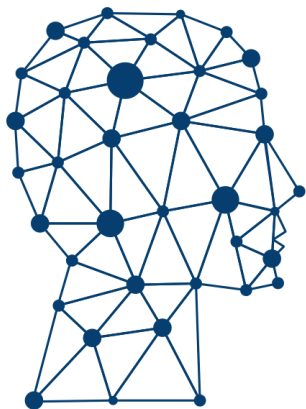
Some example in computer vision and deep learning

- International CVSS: Since 2011 Università di Catania and University of Cambridge the most important Cv summer school (IEEE PAMI Award¹)



- ECCV 2020 Glasgow (Bob Fisher GC & Andrea Vedaldi PC)
- ECCV 2020 Tel Aviv (Amnon Shasua. HBU. Lihi Zelnik-Manor Technion, Rita Cucchiara UNIMORE, Gabriel Brostow UCL)
- .. Next common Phd programs

We hope many others in the next future!



Artificial Intelligence and Intelligent Systems

cini National Lab

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Thanks.



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