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L’ IA in Italia: lo stato dell’arte, progetti strategici e scenari futuri

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Consiglio Nazionale delle Ricerche

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Outline

- State of the Art
  - (brief) AI history
  - The Italian Association for Artificial Intelligence (AIxIA)
- Projects (some)
  - A.I, Data and Robotics Association (EU)
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- Opportunity and Challenges

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What is Artificial Intelligence?

- A science studying computational techniques to emulate natural intelligence
- Artificial methods usually differ from biological ones
- How to measure the performance/quality of AI systems?
  - Utility functions?
  - Ethical issues?

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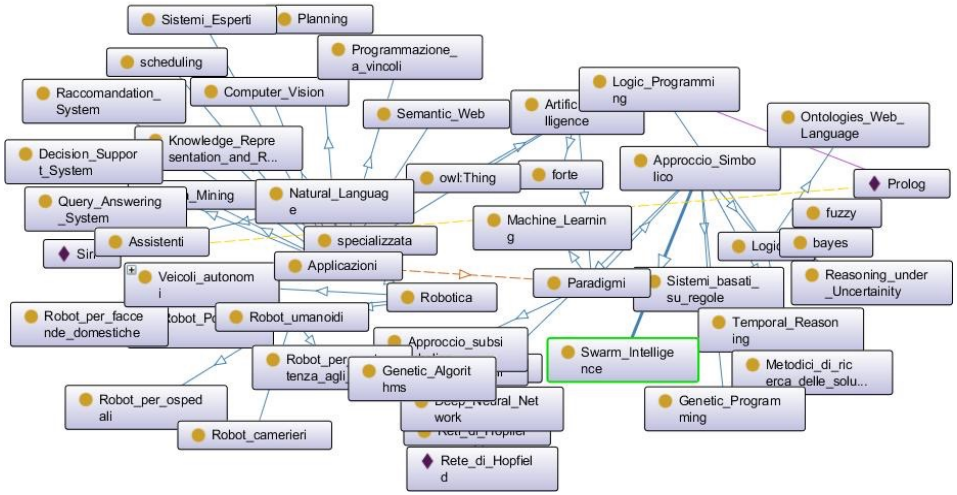
Symbolic

SubSymbolic

General or strong

Specific or weak



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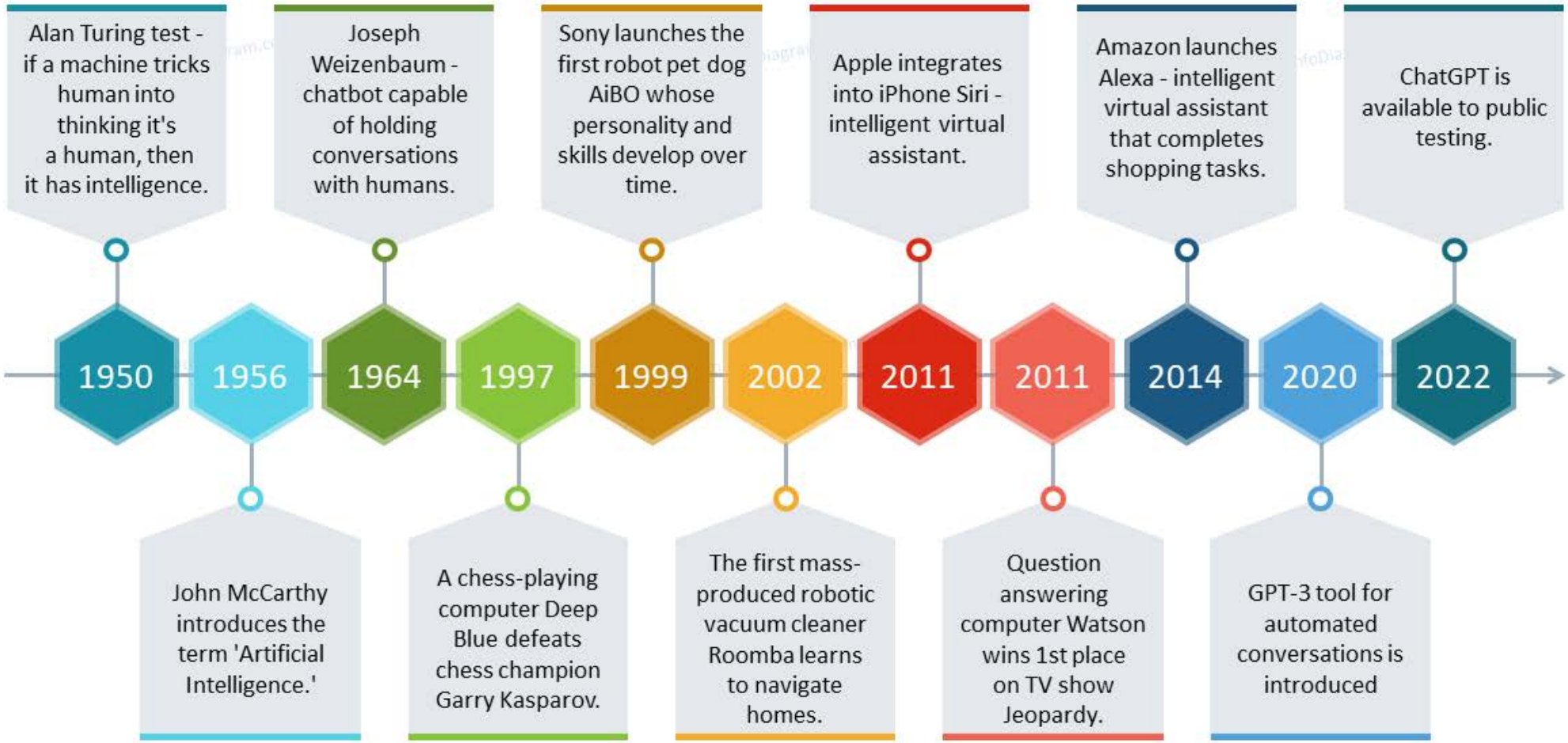
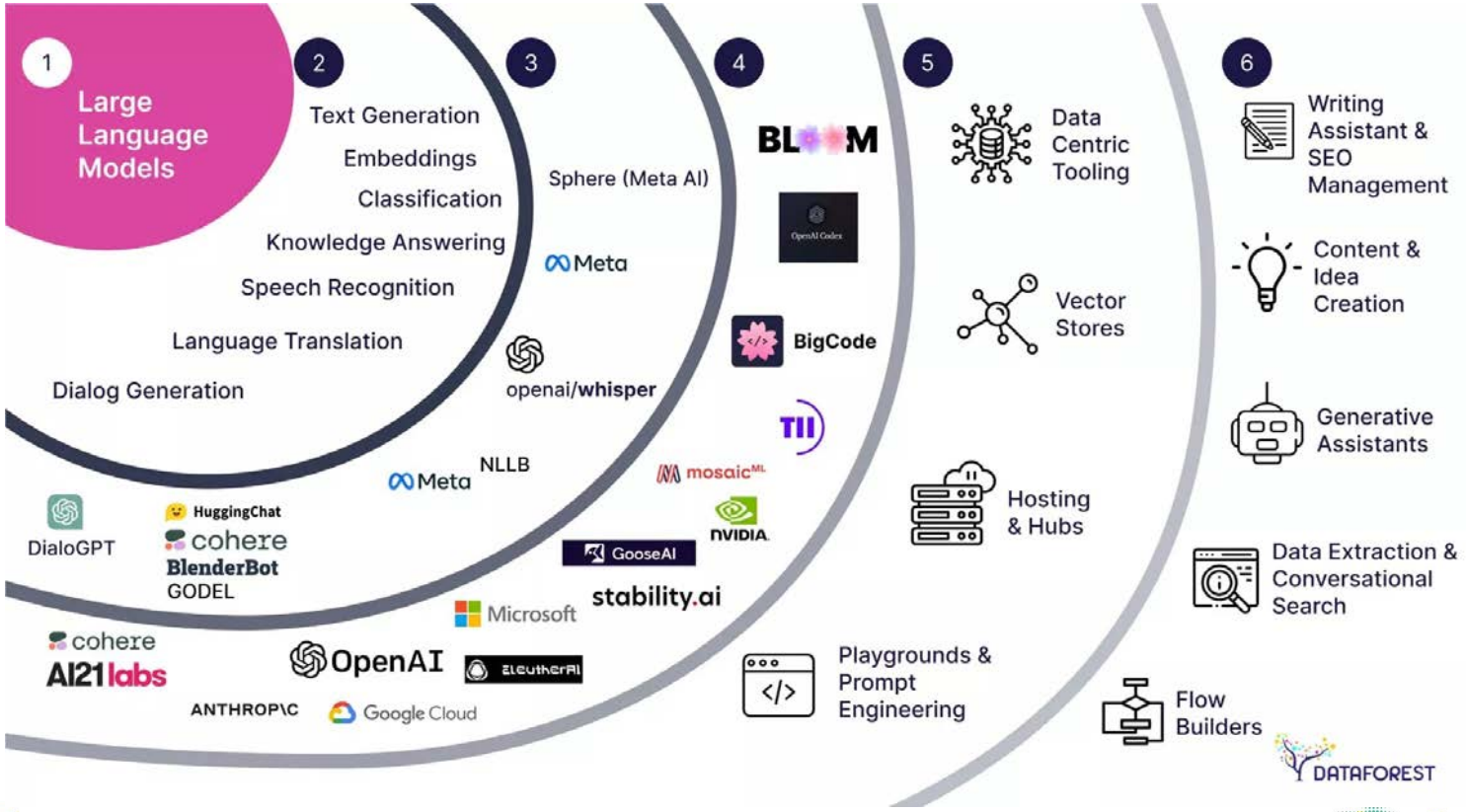
Artificial Intelligence Development History Timeline



Get these slides & icons at www.infoDiagram.com

Large Language Models



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Associazione
Italiana per
l'Intelligenza
Artificiale

The Italian Association for Artificial Intelligence

AIxIA in a Nutshell

1988 Born as a member of the European Association for AI

- It brings together the **Italian community**
- More than **2.500 members**

EurAi

Its aim is that of **increasing knowledge** of Artificial Intelligence, **encouraging its teaching** and **promoting theoretical and applied research** in the field through seminars, targeted initiatives and sponsorship of events.

Organization

Stefano **Ferilli**

Gianluigi **Greco**

Presidente

Davide **Bacciu**

Vice-presidente

Chiara **Ghidini**

Vice-presidente

Gabriella **Cortellessa**

Segretario

Roberto **Micalizio**

Tesoriere

Industrial Board

Scientific Board

+ **Working Groups**

Working Groups

- **Argomentazione** in Intelligenza Artificiale
- Apprendimento automatico e data **mining**
- Elaborazione del **linguaggio naturale**
- Intelligenza artificiale ed **ageing**
- Intelligenza artificiale e **cybersecurity**
- **Rappresentazione della conoscenza** e ragionamento
- AI e **robotica**
- Intelligenza artificiale per il **patrimonio culturale**
- Paradigmi economici e **ragionamento strategico**
- Intelligenza artificiale per la **salute**

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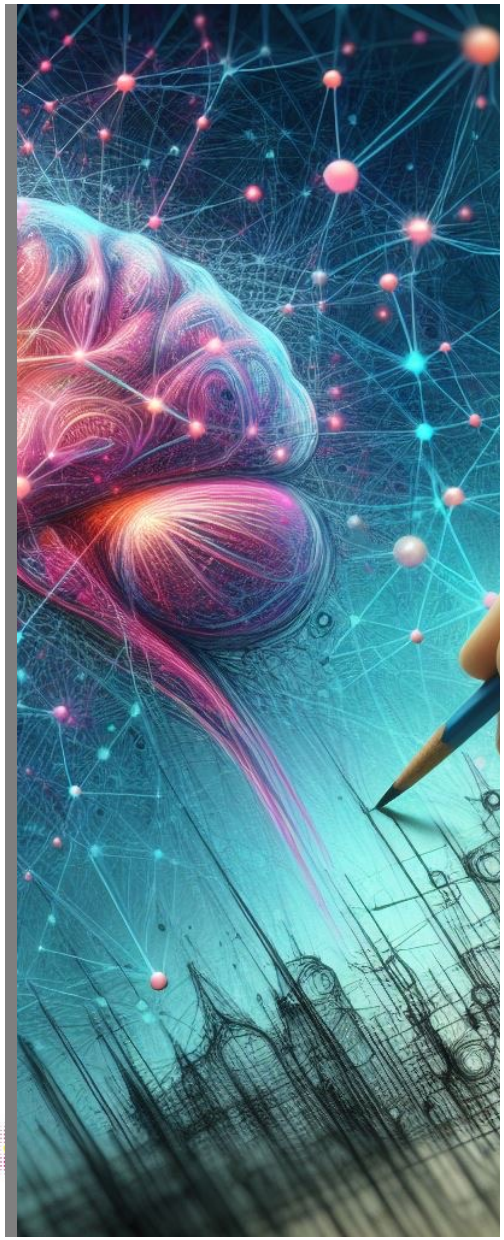
new

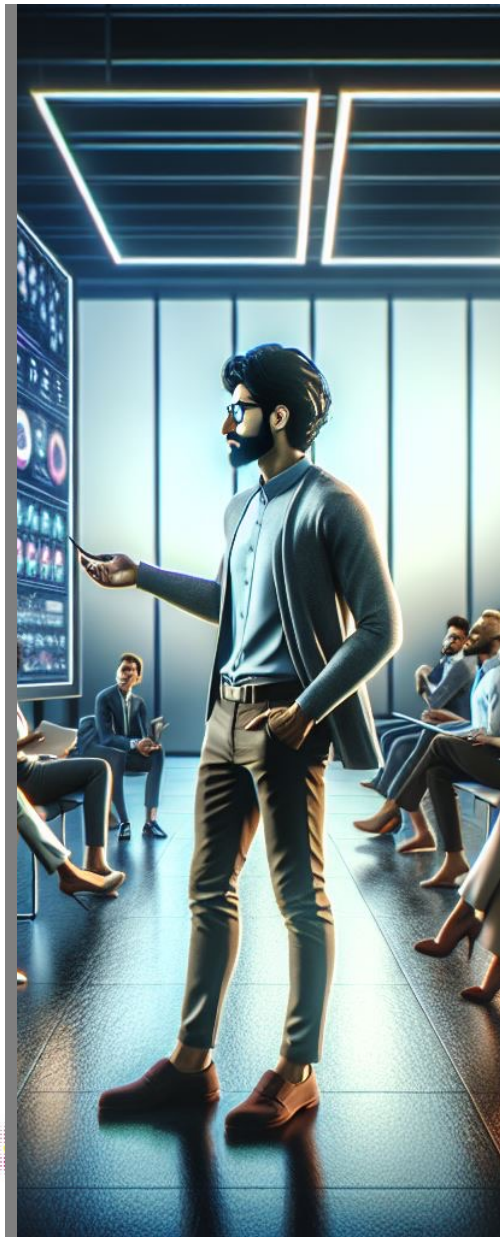
- **BPMItaly**
- **Aspetti filosofici** dell'intelligenza artificiale

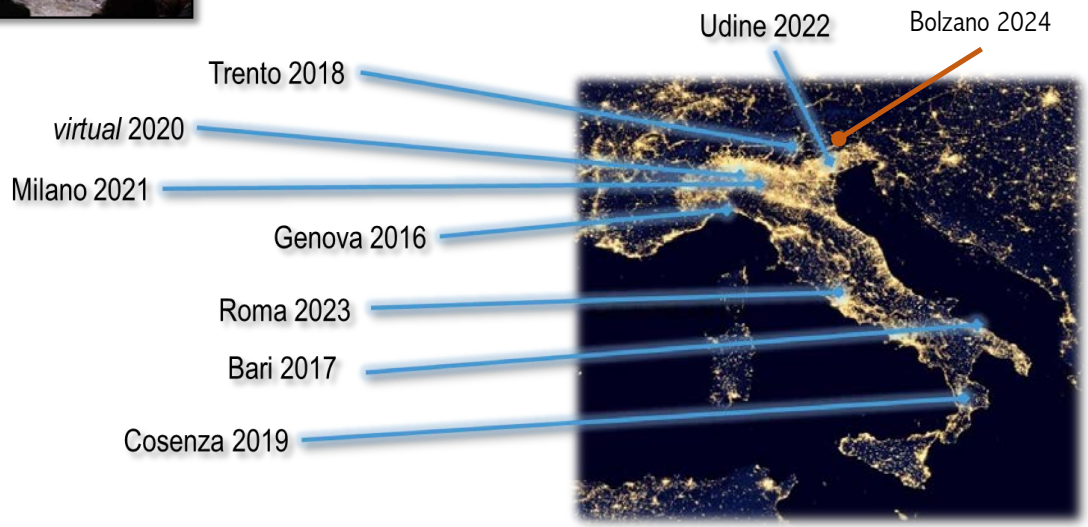
new

- AI per l'Educazione
- Quantum AI



Annual Congress





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THE EUROPEAN
CONFERENCE
ON ARTIFICIAL
INTELLIGENCE

ECAI-2025

October 25-30, 2025
Bologna (ITALY)

F. **Chesani**, M. **Milano**, A, **Omicini**

Awards

Marco Somalvico **Award - biennual**

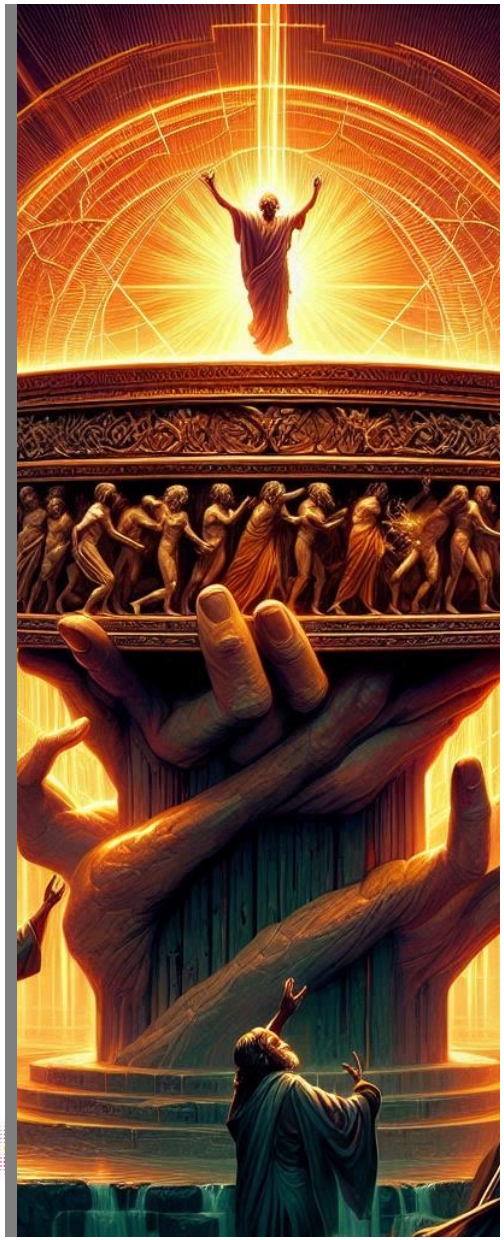
- Best young Italian researcher in AI

Marco Cadoli **Award**

- Best Ph.D Thesis in AI

Leonardo Lesmo **Award**

- Best M.SC Thesis in AI



Summer Schools

AI Forum

AIFORUM
INTELLIGENZA ARTIFICIALE
PER LE IMPRESE

VI EDIZIONE

Il Forum dell'Associazione Italiana
per l'Intelligenza Artificiale dedicato alle imprese

4 APRILE 2024

Palazzo Mezzanotte, Milano

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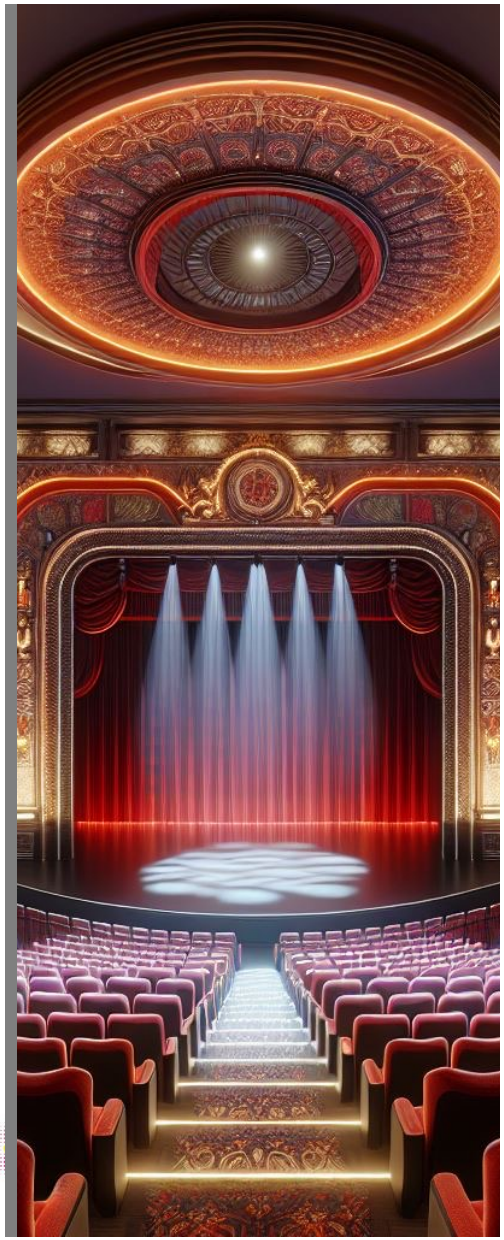
Public Events



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FUTURE AI RESEARCH
Consiglio Nazionale
delle Ricerche
FAIR
Il partenariato esteso
sull'intelligenza artificiale

FAIR Partners

12 PUBLIC INSTITUTIONS CONTROLLED BY MUR

Consiglio Nazionale delle Ricerche · INFN · Politecnico di Milano · Politecnico di Torino · Sapienza Università di Roma · Scuola Normale Superiore di Pisa · Scuola Superiore Sant'Anna di Pisa · Università di Trento · Università degli Studi di Napoli Federico II · Università degli Studi di Bari Aldo Moro · Università della Calabria · Università di Catania

2 HUB MEMBERS ONLY

UNIMORE · CINI

Other 6 PUBLIC/PRIVATE INSTITUTIONS

Fondazione Human Technopole · IIT Istituto Italiano di Tecnologia · Bocconi · Università Campus Bio-Medico di Roma · Scuola Normale Superiore · SISSA

7 COMPANIES

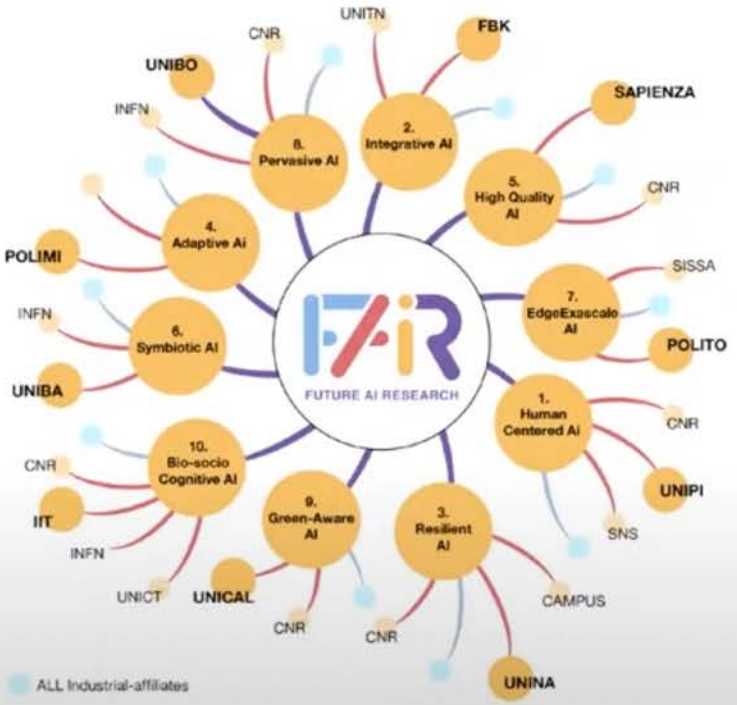
BRACCO · Deloitte. · expert.ai · Intesa Sanpaolo · Leonardo · Lutech · STMicroelectronics

Hub & Spoke Organization

In line with the **National Strategic Program for AI,** FAIR aims to:

- Advance frontier research in AI to **make Italy a global research and innovation hub of AI;**
- **Reduce** AI research **fragmentation**;
- Create **human-centered, trustworthy and sustainable AI;**
- Foster **AI-based innovation** and development of AI technology;
- Create, retain attract **AI talent** in Italy.

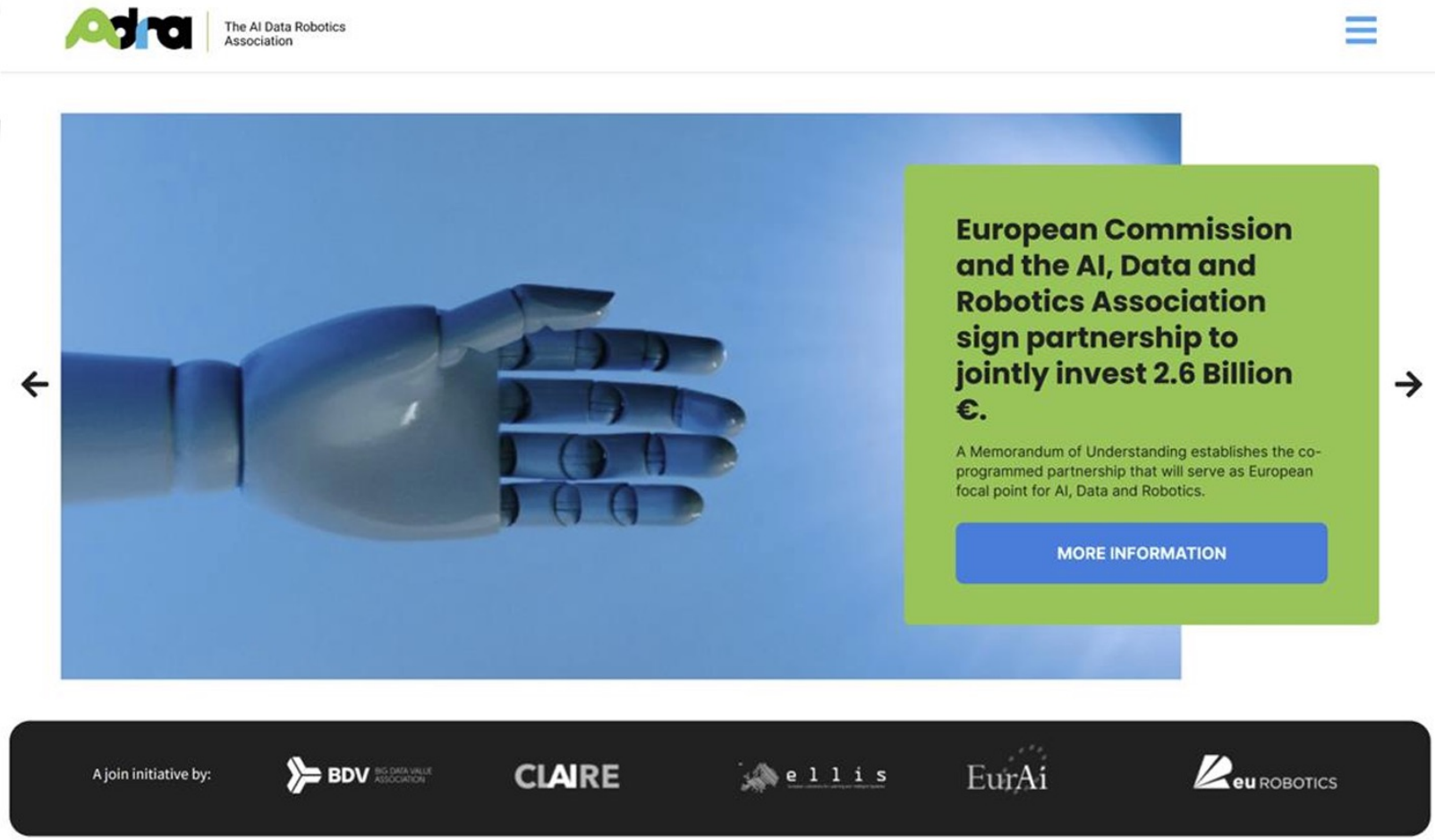
To achieve FAIR goals, we have designed a very ambitious research program organized into 10 spokes, with a coordination Hub: the FAIR foundation.



Each spoke has its own thematic characterization.

Adra Strategic Research, Innovation, and Deployment Agenda (SRIDA)

Fredrik Heintz, Linköping University & Adra



https://adr-association.eu/

Secure **European's sovereignty over AI, Data and Robotics** technologies and knowhow

Establish **European leadership in AI, Data and Robotics** technologies with high socio-economic and environmental impact

Reinforce a **strong and global competitive position of Europe** in AI, Data and Robotics

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DIPARTIMENTO
PER LA TRASFORMAZIONE
DIGITALE

AGID | Agenzia per l'Italia Digitale

STRATEGIA ITALIANA PER L'INTELLIGENZA ARTIFICIALE 2024-2026

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Prospettiva

STRATEGIA PER LA RICERCA

STRATEGIA PER LA PUBBLICA AMMINISTRAZIONE

STRATEGIA PER LE IMPRESE

STRATEGIA PER LA FORMAZIONE

MONITORAGGIO DELLA STRATEGIA

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The EU AI ACT

- UE Regulation

- Objectives
  - Ensure that AI systems in the EU are safe and respect fundamental rights & Union values
  - Ensure legal certainty to facilitate investment & innovation in AI
  - Facilitate the development of a single market for lawful, safe and trustworthy AI applications

- AI ACT: application from 2nd February 2025
  - Agenzia per l'Italia Digitale (AgID)
  - Agenzia per la Cybersecurity Nazionale (ACN)

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RESEARCH THROUGH AI: OPPORTUNITIES

- **Data Integration Across Disciplines**
  AI can process and integrate large datasets from different field **revealing connections that might otherwise go unnoticed.**
- **Predictive Modeling**
  AI could help forecasting disease outbreaks by analysing, e.g., environmental, biological, and social data. AI models could also be useful to **predict weather patterns, assess risks, and simulate environmental impac**ts, helping guide proactive measures.
- **Resource Optimization and Sustainability**
  AI helps researchers **optimize the use of resources** by identifying the most impactful areas for intervention.

AI has potentially great impact in many resarch fields

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SOME AMONG THE POSSIBLE RISKS

Warnings

- **Overreliance on AI Outputs**
  Some people view AI too optimistically, almost as if it were an "oracle," and may place excessive trust in its outputs.
- **AI "Hallucinations" and Unreliable Outputs**
  AI sometimes generates erroneous or bizarre results showing that it’s not yet fully reliable.
- **Lack of Transparency and Interpretability**
  Many advanced AI models operate as "black boxes," making it difficult to understand how they reach specific conclusions.

MORE IN GENERAL: TWO LEVELS OF RISKS

Privacy Violations
AI often requires large amounts of data, including personal information. This data can be vulnerable to misuse or breaches, leading to invasions of privacy.

Bias and Discrimination
AI systems can inherit biases from their training data, leading to unfair treatment or discriminatory outcomes

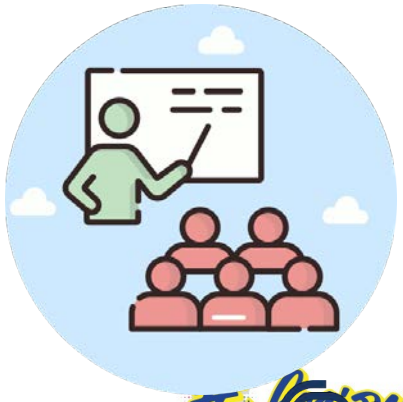
Security Risks Due to AI Vulnerabilities
AI systems can be targeted by hackers to manipulate outcomes or exploit weaknesses, posing indirect security threats to individuals.

Job Displacement
Automation through AI is leading to job losses in certain industries, especially in repetitive or manual tasks, impacting livelihoods.

Misinformation and Manipulation
AI can be used to generate convincing fake content (e.g., deepfakes), spreading misinformation or manipulating public opinion.

A SET OF POSSIBLE ADVICES

- **Expert Identification of AI Limitations and provide Usage Guidelines**
  AI experts should clearly identify the limitations of AI systems, defining **usage boundaries** and setting **best practice** and **use guidelines**.
- **Increase Awareness of AI Risks**
  Research institutions should communicate AI risks more effectively, providing **accessible information to ensure users understand potential pitfalls**.
- **Enhance Training and Education to prepare users**
  Invest in **education and training programs to improve AI literacy** among other researchers, people in general, equipping them to make informed and cautious use of AI in their fields.



Preventive measures rather than corrective ones!

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