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**State of the Art
Key Applications
Vision of the Future**

Yves DEMAZEAU
Yves.Demazeau@imag.fr

THANKS

To CNRS
To AFIA
To OECD

The slides are the sole responsibility of their author

State of the Art

State of the Art – General views

The permanent definition of Artificial Intelligence (AI)

- Intelligence : imitation of the human behaviour
- Artificial: use of informatics and electronics

--> **AI is not concerned by transhumanism. No way.**

The grounding difference between Data and Knowledge

- Computer Science vs. Artificial Intelligence

--> « **Data Science** » and « **AI** » usually cyclicly merge.

Two approaches, Cognitivism and Connexionnisme

- Western = Individual centered vs. Eastern = Society centered

--> **Everyone is right, the thruth is surely in the middle.**

The fashion effects and The cycling hype in science

- Link with science fiction in the literature, in the movies
- The cycling focus of the media on single parts of AI

--> **Quiet force. Exist for 60 years, progresses every year.**

State of the Art – IJCAI 1983 Topics

Automatic Programming	OLD
Cognitive Modelling	
Expert Systems	
Knowledge Representation	
Learning and Knowledge Acquisition	
Logic Programming	OLD
Natural Language	
Planning and Search	
Robotics	
Theorem Proving	
Vision	

The real challenge of AI is the integration of these parts

State of the Art – IJCAI 2016 Topics

Agents-based and Multi-Agent Systems

NEW

AI and the Web

NEW

Combinatorial & Heuristic Search

Human-Aware AI

Knowledge Representation, Reasoning, and Logics

Planning and Scheduling

Machine Learning

Multidisciplinary Topics and Applications

NEW

Natural Language Processing

Satisfiability and Constraints

Robotics and Vision

Uncertainty in AI

Deep Learning is only one part of Machine Learning

State of the Art – French AI Topics

Agents et Systèmes Multi-Agents
Apprentissage Automatique
Extraction, Gestion des Connaissances
Ingénierie des Connaissances
Interaction avec l'Humain : EIAH, IHM
Reconnaissance des Formes, Vision
Représentation et Raisonnement
Robotique, Automatique
Satisfaisabilité, Contraintes
Traitement Automatique des Langues

pfia2017.greyc.fr

French AI meets every last week before summer holidays

Key Applications

Key Applications – Examples

General

- Optimisation of every kind. Instantaneous increase of productivity thanks to Deep Learning. New products also, indeed but the human creativity is limited. Concern : destruction of jobs.

Day Life

- Intelligent house, verbal orders, energy regulation. Direct language translation. Artificial companions, personal assistants, support to people (from elderly to babies). Concern : data protection, privacy.

Transports

- Transport networks, intermodality. Intelligent town. Pedestrian guidance, speed limit, parking management. Autonomous vehicles: subway, car, drones, planes. Concern : scalability, legal issues.

Society

- Interactive games, serious games. Social network, matchmaking. News personalisation. New communication media, organisation structures. Concern : communication (over)flow, moral issues.

Key Applications – AFIA Newsletters

Freely downloadable from the web...

- Janvier 2012 n° 75 **Agronomy**, JFSMA 11, TIA 11
- Avril 2012 n° 76 **Robotics**, RFIA 11, E&
- Octobre 2012 n° 78 **Innovation**, ECAI 12
- Janvier 2013 n° 79 **Ethics**, Rob&IA 12
- Avril 2013 n° 80 **Big Data**
- Octobre 2013 n° 82 **Virtual Reality**, PFIA 13
- Janvier 2014 n° 83 **Economics**, RO&IA 13, MACS&IA 13
- Avril 2014 n° 84 **Medicine**, TAL&IA 14
- Octobre 2014 n° 86 **Education**, RJCIA, RFIA 14
- Janvier 2015 n° 87 **Video Games**, PDIA 14
- Avril 2015 n° 88 **Decision Support**, SCo& 15, IHM& 15
- Janvier 2016 n° 91 **Transports**, RO&, PDIA, MACS&, RI& 15
- Avril 2016 n° 92 **Digital Humanities**, EGC&, RV&, TAL& 16

afia.asso.fr

The French AI Association gathers more than 348 people

Vision of Future

Vision of the Future – Goal directed – World News

March 2016

USA

- GOV: Four workshops, National consultation, Report in Oct. 16
- GAFA: have their own (coordinated) plans. AI world partition.
- Car industry is also largely investing in AI. Others do also...

May 2016

China

- GOV: The government has launched a 3 years program in AI
- BATX : are developing similar efforts than GAFA. Partly unknown.
- Drone industry is also largely investing in AI. Others do also...

June 2016

Japan

- GOV : The government has issued a national plan including AI
- Fujitsu, Hitachi, Mitsubishi, NEC, Panasonic re-invest in AI.
- Robotics industry is also largely investing in AI. Others do also...

XXX 201X

Others

- **AFIA Industry College** : Ardans, Berger-Levrault, Dassault aviation, Huawei, IBM France, Mondeca, Thales...

Vision of the Future – Goal directed – France News

Agents et Systèmes Multi-Agents	B	H			
Apprentissage Automatique	B	H	I	M	T
Extraction, Gestion des Connaissances	B		I	M	
Ingénierie des Connaissances	A	B	D		M
Interaction avec l'Humain : EIAH, IHM	B	D	H	I	
Reconnaissance des Formes, Vision	B	D			T
Représentation et Raisonnement	A	B	H	I	M
Robotique, Automatique		D			
Satisfaisabilité, Contraintes		D	H	I	M
Traitement Automatique des Langues	A	D	I		

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An Industry College to better connect industry to research

Vision of the Future – Data Driven – Personal News

Personal boundaries

- No research on Anthropomorphic Agents
- No research on Simulation of Emotions

Prospective in MAS

- Scalability, towards 100 000 000 Agents
- Users will either Human or Virtual Agents
- The Designer may be one of the Agents
- User centering will also deal with Groups
- New models of Interactions, Organisations
- **Integration** of the best parts, Emergence
- “ Big Knowledge” / Understanding Learning
- **Explainability** more than Transparency
- Evaluation by the Designer, by the User

Policy idea to share

- **Ethics** by Design of Large-Scale MAS [Ethics 2014]
- Balancing between Legal and Moral Issues [Ethics 2016]

Recommendations

RECOMMENDATIONS

- Get governments and international agencies more aware**
- Revisit educational cursus with more AI theory & practice**
- Invest into all disciplines of AI, not only in Deep Learning**
- Recognize the intrinsic limitations of human capabilities**
- Do not be afraid to subcontract problems to AI systems**
- Respect the people from the start of the systems design**
- Normalize what can be normalized, but do not force it**
- Respect cultural and religions differences in applying AI**
- Separate all human communications into facts + opinions**

Thank You !