State of the Art
Key Applications
Vision of the Future

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THANKS

To CNRS
To AFIA
To OECD

The slides are the sole responsibility of their author
State of the Art
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 truth 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
Cognitive Modelling
Expert Systems
Knowledge Representation
Learning and Knowledge Acquisition
Logic Programming
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

<table>
<thead>
<tr>
<th>Topic</th>
<th>Status</th>
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<tr>
<td>Agents-based and Multi-Agent Systems</td>
<td>NEW</td>
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<td>AI and the Web</td>
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<td>Combinatorial &amp; Heuristic Search</td>
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<td>Human-Aware AI</td>
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<td>Knowledge Representation, Reasoning, and Logics</td>
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<td>Planning and Scheduling</td>
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<td>Machine Learning</td>
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<td>Multidisciplinary Topics and Applications</td>
<td>NEW</td>
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<td>Natural Language Processing</td>
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<td>Satisfiability and Constraints</td>
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<td>Robotics and Vision</td>
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<td>Uncertainty in AI</td>
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**Deep Learning is only one part of Machine Learning**
The Eastern World and the Western World starts to interact
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

Transports

Society
**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

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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
### Vision of the Future – Goal directed – France News

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[afia.asso.fr](http://afia.asso.fr)

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 religious differences in applying AI
Separate all human communications into facts + opinions
Thank You !