

DE LA RECHERCHE À L'INDUSTRIE

cea



InTheArt

An AI working group, initiated by CEA
(with also ~15% participants outside CEA)

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Various topics discussed within the group, from Physics to Biology

- IA used in many different topics :
 - Genomics :
 - Classical approach: statistical association between each unique variation of the genome and a particular disease
 - Human genome: 3 billion nucleotides, 3 billion potential variations + epigenetic factors
 - Today: poorly correlated results with the observation of familial transmission of some diseases
 - Climate (some examples presented by D. Faranda)
 - Detectors

Idea of the group:

Share the knowledge, discuss and work together, through and open group.

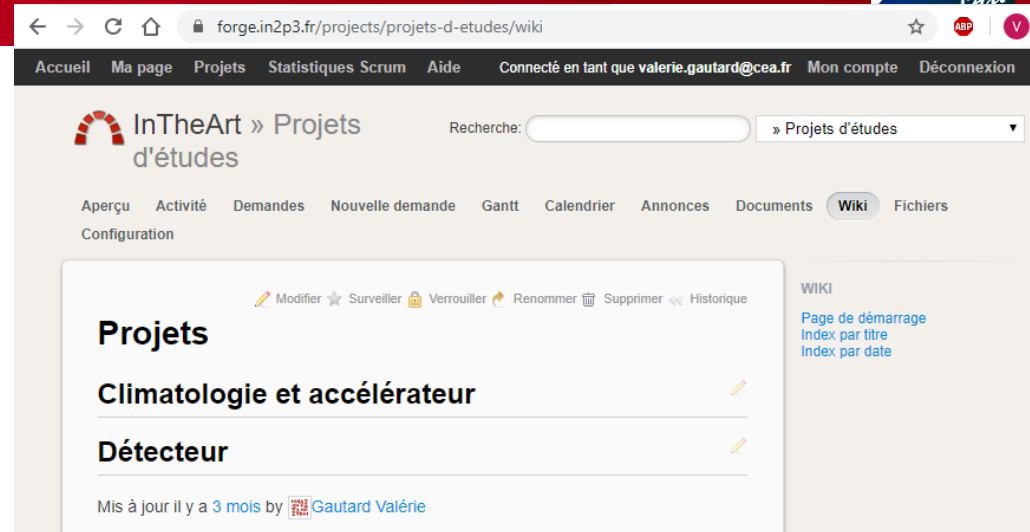
Not only CEA people, your participation is more than welcome !

Participation from : CEA (DEN, DRT, DRF-IRFU and CNRGH), CEA-CNRS (IPhT, Neurospin, LSCE) and Paris-Saclay (Paris-Sud) university

Some grants from **CEA – DRF** (*fundamental research part*)

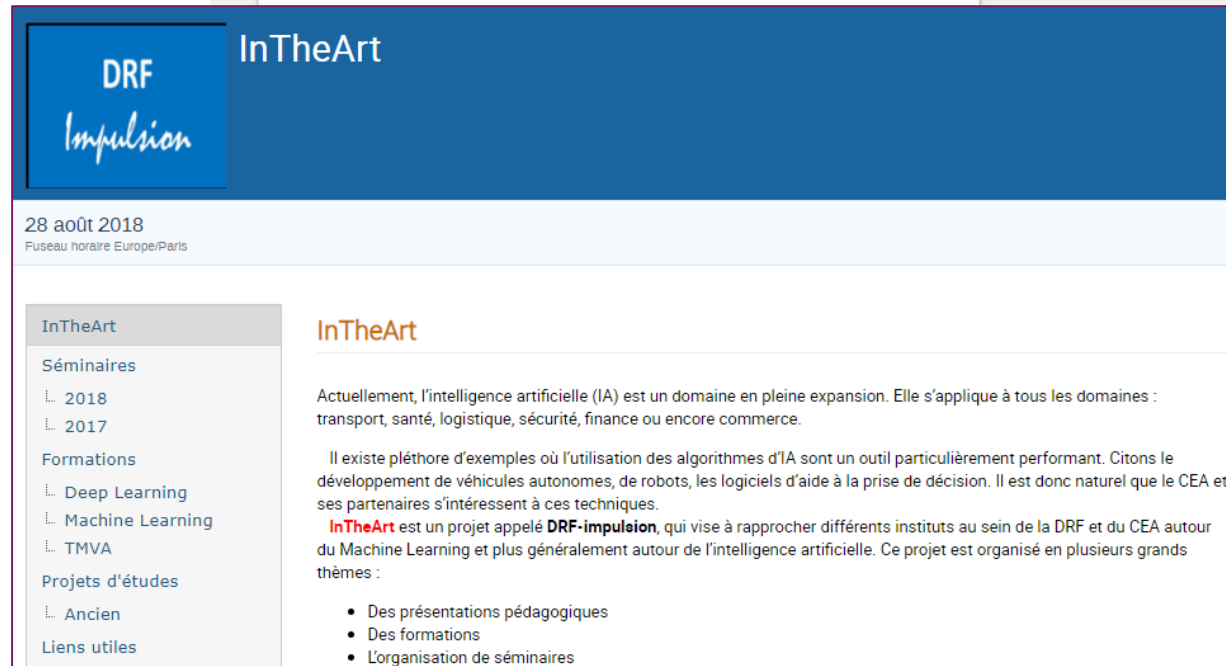
About 100 participants from

- ▶ LSCE, CNRGH, IRFU
- ▶ DEN, DRT
- ▶ IN2P3
- ▶ Paris-Saclay univ. (Paris-Sud), etc.



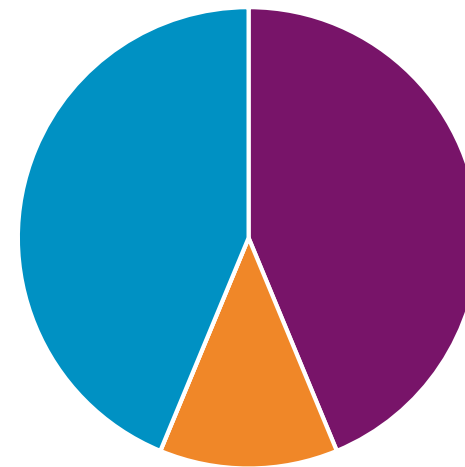
Communication :

- ▶ An open internet site:
<https://indico.in2p3.fr/event/17858/page/1967-intheart>
- ▶ Redmine site to discuss together:
<https://forge.in2p3.fr/project/s/projets-d-etudes/wiki>



From 2017

- ▶ Number of seminars:
 - 2017 : 1
 - 2018 : 6
 - 2019 : 8
- ▶ Various topics
 - Lack of chemistry participants/subjects (in view of biology /genetics developments)
- ▶ Discussions following each seminar



- Biology
- Physics
- Chemistry
- Mathematic, Machine learning

➔ Constitution of a group from beginners to experts

From 2017

- ▶ By the peer
 - Deep Learning,
 - TMVA
 - Krigeage
 - Julia
- ▶ Mooc followed
 - Machine Learning – Stanford University:
<https://www.coursera.org/learn/machine-learning>
- ▶ A new cycle of training
 - L'IA, au-delà d'une injonction (niveau débutant)
 - Sélection et mise en pratique des différentes méthodes de Machine Learning (utilisateur)
 - Validation et exploitation des données d'IA (expert)

 **Many interested persons**



Workshop IA (within CEA) *(org. V.Fardeau, V.Gautard)*

- ▶ December the 17th
- ▶ More than 200 persons at Saclay
- ▶ Participants from CEA Marcoule, Cadarache, Evry and Grenoble
- ▶ DEN, **DRF**, DRT



Topics

- ▶ **Artificial intelligence for a gamma-detector for high resolution PET imaging**
 - PhD

- ▶ **Machine Learning technics for chaotic systems**
 - see Davide Faranda talk
 - some internship students
 - (future collaboration with RIKEN)
 - soon, grant for a PhD

- ▶ **Artificial Intelligence techniques for advanced modelling of accelerators**

- A motivated and active group from CEA, CNRS and Paris-Sud university
- You are welcome to participate to the group. Contact us !
(to be in our mailing list, please send an email to: valerie.gautard@cea.fr)
- Study of different “use-case”
- Try to attract and develop the group on complementary activities:
 - Involvement of geneticists, mathematicians, statisticians, physicists
but a lack of chemists and biologists
- Web site: <https://indico.in2p3.fr/event/17858/page/1967-intheart>