Research and Education

Digital Trust for Smart-ICT

Prof. Dr. Pascal Bouvry,

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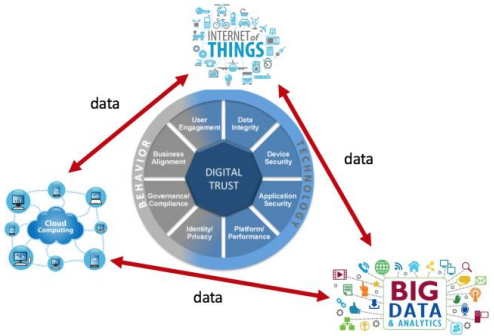
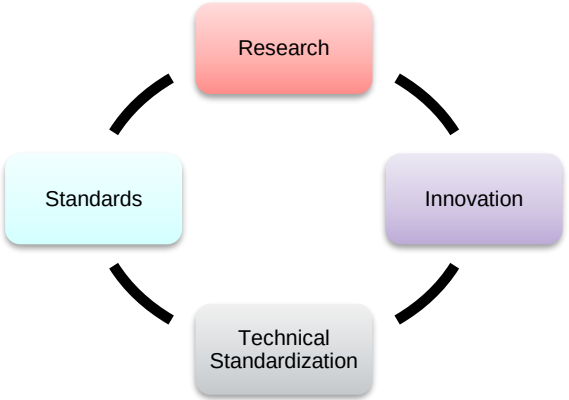
ILNAS-SnT/UL Research Programme on Smart ICT

- Technical Standardisation on Smart ICT with Digital Trust (Big Data, IoT, Cloud Computing)
- Duration
  - 4 years research project
  - Co-funded by ILNAS-UL/SnT
  - Start date: 01/2017
- Participants
  - 3 PhD students, 1 postdoc, 1 professor
  - ILNAS/ANEC/UL personnel also participates
- Research programme objective
  - Creating an innovative environment on digital trust for Smart-ICT and the related standardization efforts
  - Development of a new master program (Lifelong Learning) in collaboration with industry



What is the Programme about?

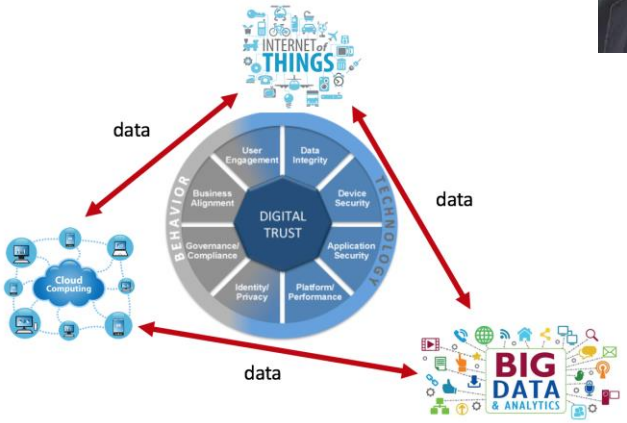
- Technical Standardisation on Smart ICT with Digital Trust (Big Data, IoT, Cloud Computing)
  - Currently, three core areas are highly active in research and commercial applicability
  - IoT, Cloud Computing, Big Data & AI
  - These technologies are highly connected by application types and most importantly by the interchange of data
- Technical standardization is paramount for success
  - To support adoption by fulfilling user expectancies, i.e. providing guarantees
  - Uncertainties diminish growth and adoption
  - Avoid confusions between different formats and pre-standards
  - Users are concerned about their privacy and security
  - To support economic growth
- Technical standardization is key to implement digital trust and security
  - Standards are chosen from potential to address privacy and security concerns
  - Important for users, citizens and companies to feel safe in using new technologies



Research Programme Team (UL)

Nader Samir
- PhD Candidate
- Industrial experience in UAVs

Prof. Pascal Bouvry
- PI

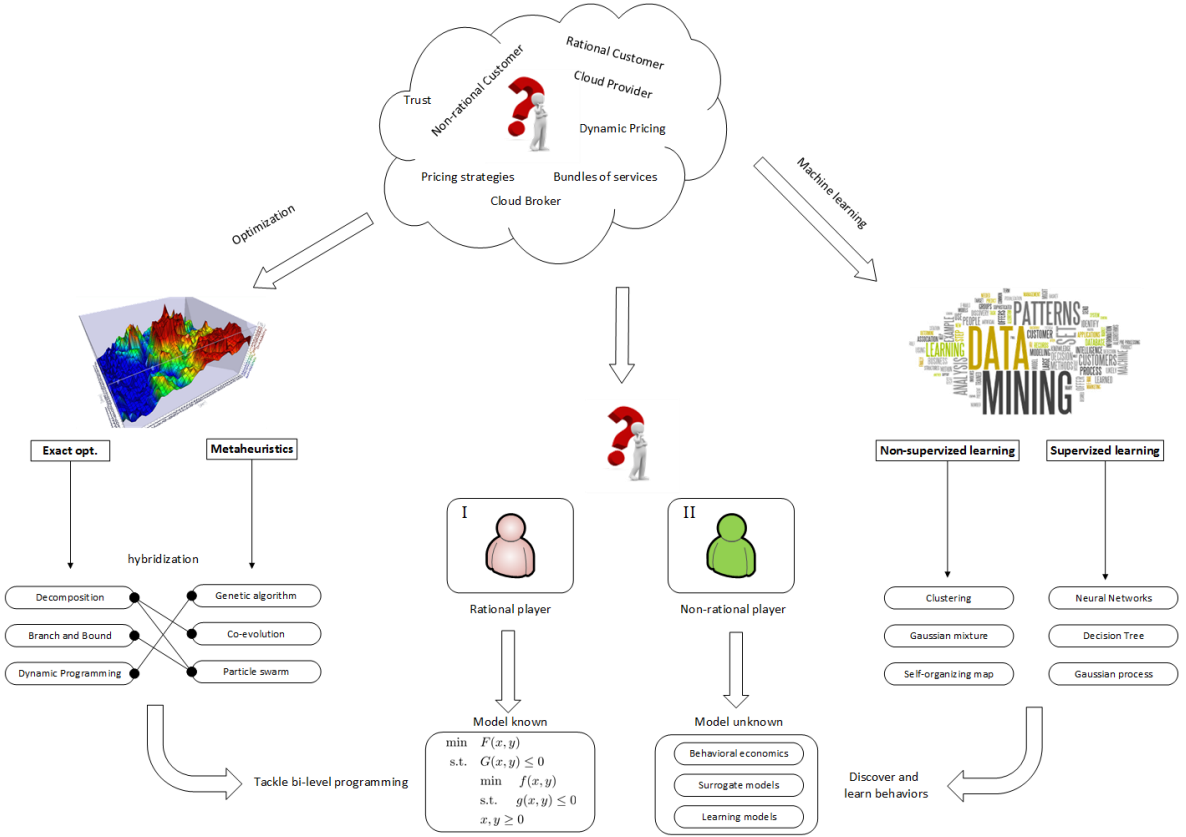


Chao Liu
- PhD Candidate
- Cloud Computing

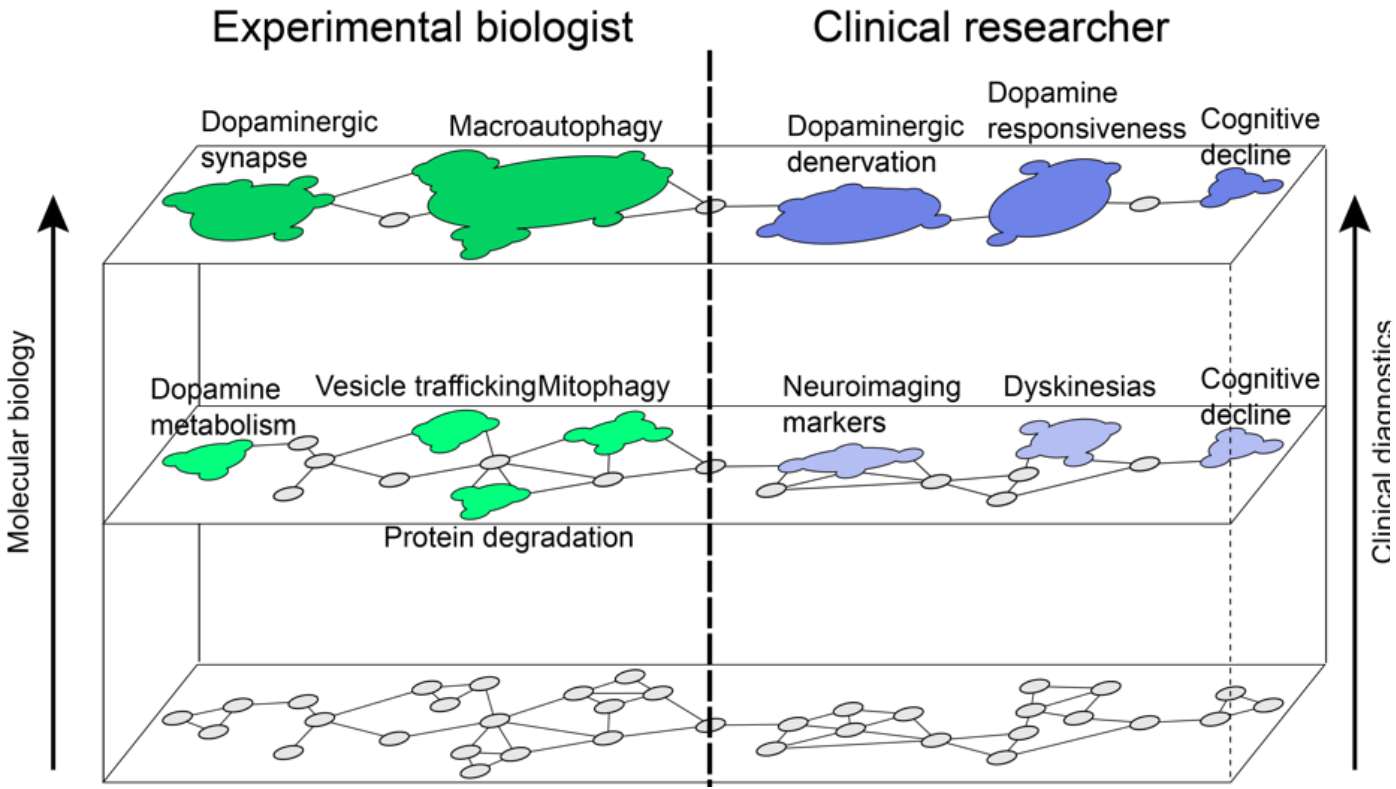
Matthias Brust
- Postdoc
- supervision support
- research

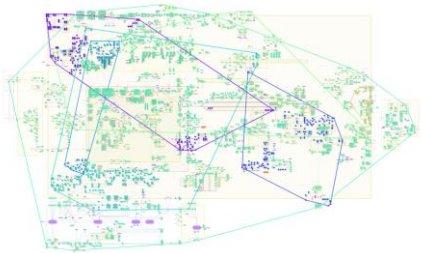
Saharnaz Dilmaghani
- PhD Candidate
- Standardization experience
- Big data publications

Cloud Pricing



Big Data


Experimental biologist
Clinical researcher
Dopaminergic synapse
Macroautophagy
Dopaminergic denervation
Dopamine responsiveness
Cognitive decline
Dopamine metabolism
Vesicle trafficking
Mitophagy
Protein degradation
Neuroimaging markers
Dyskinesias
Cognitive decline
Molecular biology
Clinical diagnostics



Our current UAV Research

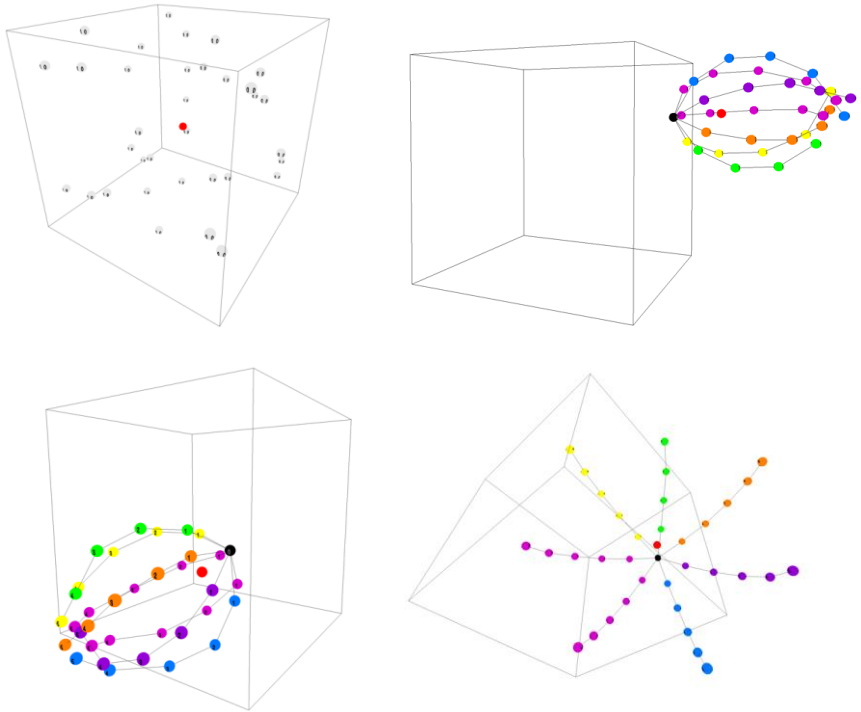
- **Autonomous UAVs swarms**
  - Embedding wireless communication interface
  - Form Flying Ad Hoc Networks (FANETs)

- **Research challenges**
  - New mobility mobility models for autonomous UAV swarms

Nature Inspired Techniques

Malicious UAV Intrusion

- UAV Defense System for Interception of Malicious UAVs
- Motivation:
  - Establishing flight zone protection
  - Against intrusion of malicious drones
- Approach
  - Model development of an autonomous UAV defense swarm
  - Detects, intercepts, and escorts malicious UAVs out of the flight zone



Defense against Malicious UAVs with an Autonomous and Networked UAV Defense Swarm, M.R. Brust, G. Danoy, P. Bouvry, D. Gashi, H. Pathak, M.P. Goncalves, IEEE LCN, 2017

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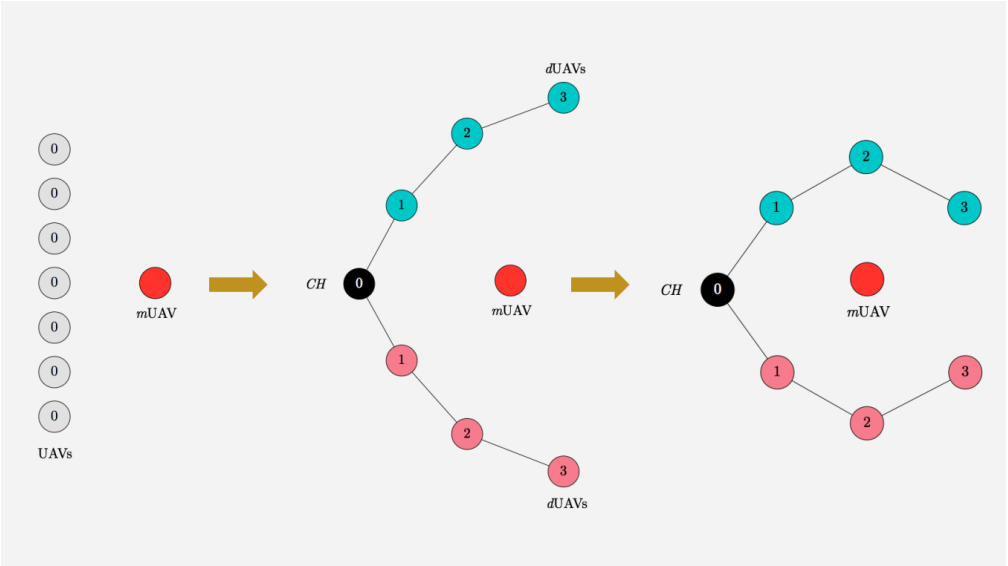

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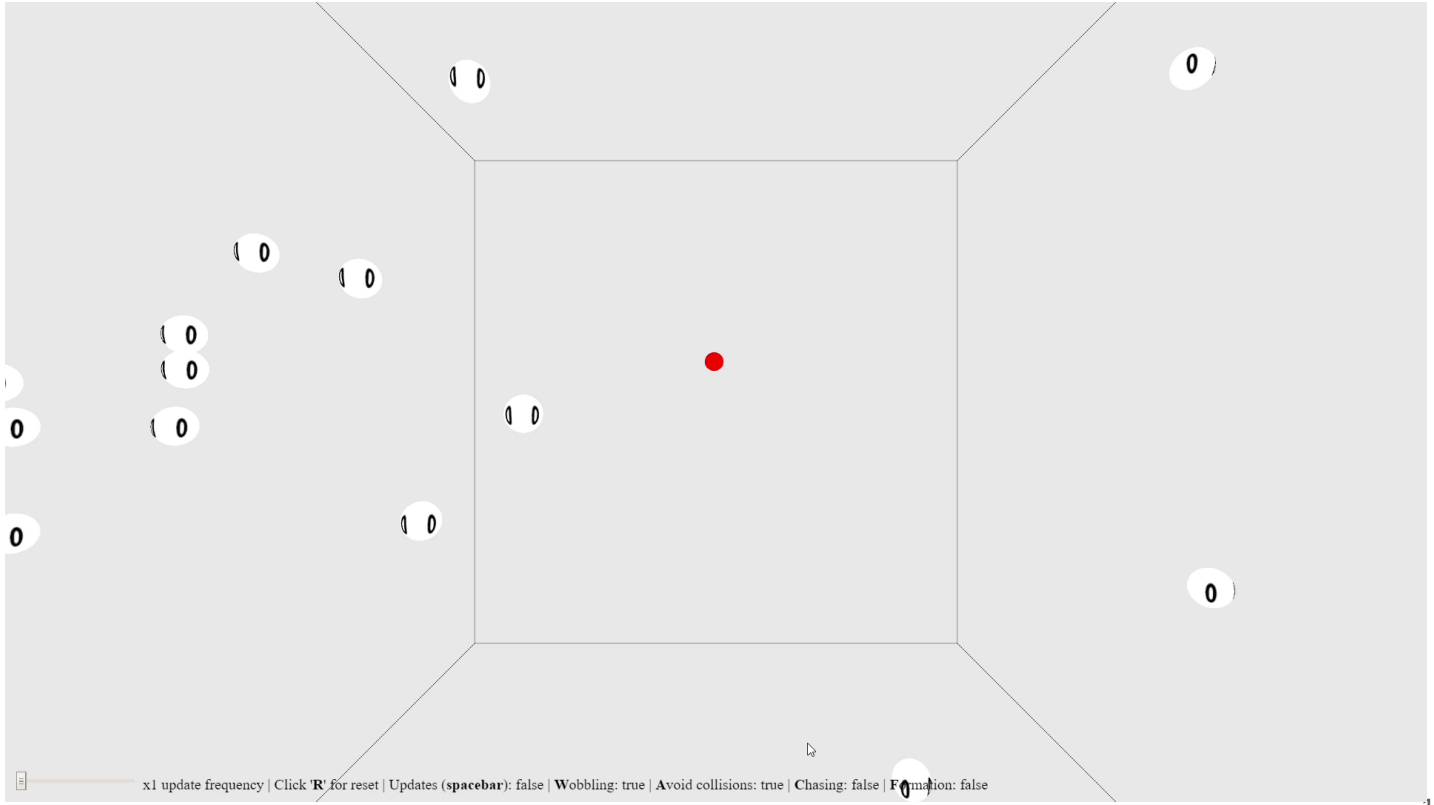
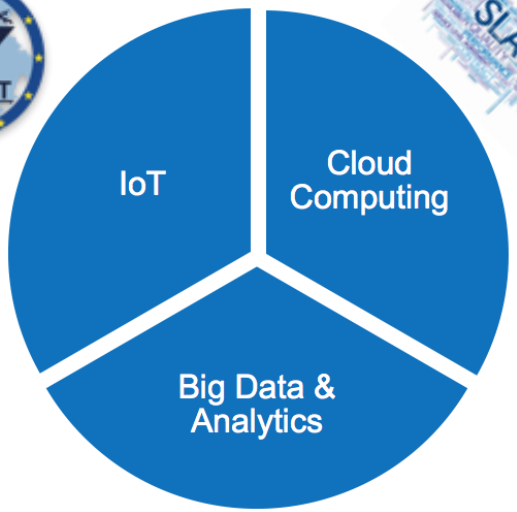


PCOG Research & Standardization Committees

PCOG Research
- Optimized mobility models
- UAVs autonomy, path planning models, and other constraints
- UAV swarms multi-fleet of multi-rotors and fixed wings
- Trusted and secure communication protocols

ISO/TC 20/SC 16 – UAVs
ISO/IEC JTC 1/WG 10 – IoT
ETSI TS 102 941 – ITS Security; Trust and Privacy Management



PCOG Research
- Coordinated Cloud Services implying service definition and interoperability
- Dynamic pricing models: provider, broker and user viewpoints
- Cloud SLAs and Pricing

ISO/IEC JTC 1/SC 38 – Cloud Computing and Distributed Platforms
ETSI TR 103 125 – SLAs for Cloud services
ETSI SR 003 382 – Cloud Computing Standards

PCOG Research
- Biomedical data standardization (CDISC)
- Efficient and privacy-compliant data integration at an international level

ISO/TC 276 – Biotechnology
ISO/IEC JTC 1/SC 42 – Artificial Intelligence
ETSI ISG CIM – group on Context Information Management for smart city interoperability

Master in Digital Trust for Smart ICT

Thank you

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