Design, production and integration of intelligent mechanical systems

2017 June 20th
« I4.0 Innovation Ecosystem Forum Europe » roundtable

Arnaud Bocquillon – Scientific coordinator for « Intelligent Systems & Robotics » and « Engineering driven by Uses and Services »
Mission and territory

ViaMéca is a French « pôle de compétitivité » (competitiveness cluster) devoted to Mechanical engineering. **Design, production and integration of intelligent mechanical systems**

It brings together:
- Companies (SMEs and groups),
- Research centers (public and private ones),
- Educational establishments

with the aim of accelerating innovation and enabling the emergence of innovative collaborative projects.

ViaMéca’s territory and potential:
- Center part of France distributed on Massif Central and French Alps area.
  - 4,000 enterprises
  - 2,500 researchers
  - Large industrial groups

⇒ more than 30% of the French mechanical workforce
Keypoints (2016)

- 158 members
  - 50% of companies and local cluster,
  - 15% of « innovative SME’s »
  - 20% of research and/or education bodies

- More than 415 R&D collaborative projects labeled since 2006

- More than 200 founded projects
  - 60/200 linked to FoF domains (in the light of EFFRA roadmap)

- More than 500 companies and 342 labs involved in these 200 projects (157 ; 118 in AURA Region)
Thematic roadmap III.2 (2017-2018)

SRP
Robotic and Productive Systems

IPS
Surface Engineering and Manufacturing

PAF
Advanced Manufacturing Processes

IUS
Engineering driven by Uses and Services

This project is co-financed by the European Regional Development Fund through the Interreg Alpine Space programme
Targeted Markets

Promote and sustain Product-Services Systems dedicated to productive systems of the future

- Ecosolutions for powertrain (automotive, ...)
- Disassembling and recycling
- Connected tools
- Subassembly of structures (airframe, ...)
- Intelligent systems for construction equipment
- Forestry mechanization
  - Wood processing
- Precision farming technologies: machinery and robotics
- Food industry mechanization and robotization

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Thematic roadmap III.2 (2017-2018)

Surface Engineering and Manufacturing
- Surface characterization and modelisation
- Environment / surfaces / material Interactions
- Engineering and manufacturing

Advanced Manufacturing Processes
- Additive manufacturing
- Machining processes (Subtractive)
- Forming processes
- Multi-material assembling and disassembling
- Optimal design and hybrid processes

Robotic and Productive Systems
- Optimal and robust design with respect to usage
- Integrated robotic systems (industrial, mobile...)
- Digitalization of productive equipment
- Productive systems performance

Engineering driven by Uses and Services
- Engineering driven by usage and functionalities
- Industrial company transformation (digitalization, servicization...)
- Company trajectory on value chains: Network, value creation and sharing

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Good practices (1)

Our thematic roadmap is relevant in regard with EFFRA roadmap for FoF
Good practices (2)

Métallic Additive Manufacturing in Auvergne-Rhône-Alpes is a hub of actors and skills made by and animated by ViaMéca
Good practices (2)

2016 actions

• 2 national FUI Projects : ALMEE, 3D Hybrid

• « On demand » Training : 2 days ; 3 x 20 BTS teachers in Clermont Ferrand, Lyon/Saint Etienne et Grenoble

• RAFAM industries is born : 8 SME’s from ViaMéca
Good practices (3)

- Hub of 8 « pôles de compétitivité »
- Moderated by ViaMéca
- Collective map of our skills on FoF (EFFRA)
- 250 collaborative projects done on FoF since 2005
Results for us

BIFOCAlps / EUROPE – InterReg

Involved in Vanguard Initiative

Involved in 4 Motors for Europe

2017: Collaborative application on ESCP program
European Strategic Cluster Partnerships for Smart Specialisation Investments
Results for our members
Objectives:
- Industrialize a driverless shuttle
- Improve fleet supervision
- Develop service offer
- Experimentation of the shuttle AND the service offer on an industrial plant.
Résumé :
Développement d’une Cellule de LavagE industriel AutoNome Robotisée pour le nettoyage des surfaces complexes en milieu agroalimentaire.

Partenaires R&D : 
Partenaires PME : 
Partenaires Groupes :
Objectives:

The FALAFEL project aims to implement and validate on aircraft parts in industrial conditions direct manufacturing processes (laser spray, EB and LB powder bed selective fusion) for metal or metal matrix composite parts (allowing a good compromise between performance and density).
TOLE AUTO
High formability aluminium alloy sheet for car weight reduction

Objectives:

The challenge in this project is to enable the generalisation of the use of aluminium for mass produced car bodies at a lower weight reduction cost thanks to the development of solutions involving rolled aluminium alloy products.
GMP DLC²
Groupe Moto-Propulseur Diamond Like Carbon
Designed for Low Carbon dioxide emission

Objectives:
- to reduce GHG and consumption of thermics power unit and transmission for automotive industry.
- to demonstrate benefits from 1 to 4 gC02/km with DLC (diamond like carbon) coatings.
Thank you for your attention!

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