

AIMEN Technology Centre
Project Coordinator Dr. Antón García Díaz
www.aimen.es

FRAUNHOFER ILT
Name: Stefan Mann
www.ilt.fraunhofer.de

ONERA
Name: Grègory Vincent
www.onera.fr

LMS - University of Patras
Name: Panos Stavropoulos
www.lms.mech.upatras.gr

New Infrared Technologies S.L.
Name: Germán Vergara
www.niteurope.com

PRIMA ELECTRO SPA
Name: Rachele Generoso
www.primaelectro.com

Permanova Lasersystem AB
Name: Anna Wallner
www.permanova.se

EMO-Orodjarna Doo
Name: Matjaz Milfelner
web.emo-orodjarna.com

Centro Ricerche FIAT SCPA
Name: Giuseppe D'Angello
www.crf.it

SILL OPTICS GMBH & CO KG
Name: Manuel Zenz
www.silloptics.de

Centre National de la Recherche Scientifique
Name: Jean Luc Pelouard
www.cnrs.fr

Bit Addict AB (BIT)
Name: Niclas Wikström
www.bitaddict.se

AIMEN Technology Centre
Polígono Industrial de Cataboi SUR-PI-2 (Sector 2),
Parcela 3
ES36418 Porriño - Pontevedra
Phone: +34 986 344 000
aimen@aimen.es
www.aimen.es

Partners



Project Coordination

Coordinator Office contact:

Dr. Jorge Arias
jarias@aimen.es
Phone: +34 344 000
Fax: +34 986 337 502



Multimodal spectrAl control of laSer processing with cognitivE abilities



www.mashesproject.eu

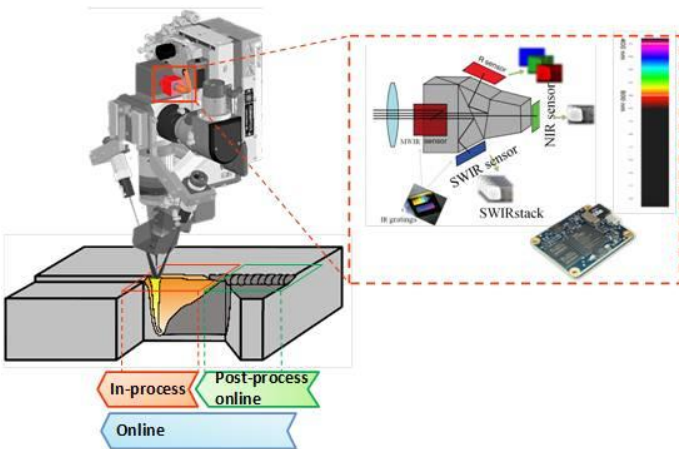


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MASHES will develop a breakthrough compact imaging system for RT closed-loop control to ensure zero-failure in laser-based manufacturing.

It will be built on a novel multispectral optics and multisensor arrangement in the VIS-MWIR spectrum. Temperature, geometry, and speed will be imaged accurately and reliably. RT process control, and cognitive readjustment and process quality diagnosis will be embedded.

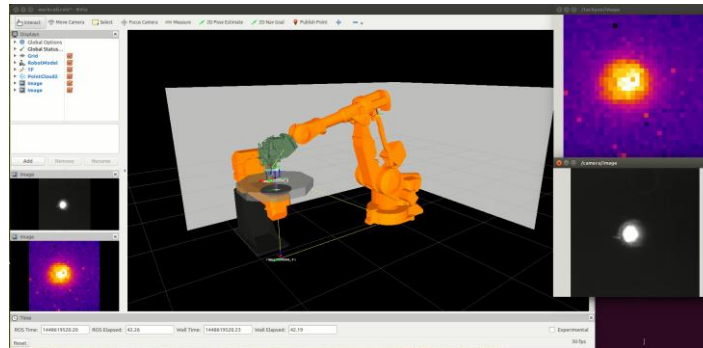
A high-speed snapshot multispectral imaging approach to process monitoring and control has a high potential for the discrimination of material properties and an accurate visualization of the real temperature.



Project duration:
3 years

Starting project date:
December 1st, 2014

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TECHNICAL GOALS

With this aim, the following technical goals were defined:

- Developing a compact and cost effective multispectral imaging device
- Multimodal operation of the system
- Fast and accurate measurement of temperature
- Implementation of the system in an embedded platform
- Implementation of a cognitive system to configure the RT control and to perform the quality process diagnosis
- Embedded interoperability, compliant with CPS operation in a cognitive 4.0 factory
- Demonstration of the system in laser metal deposition (LMD) and laser welding processes.

As a result, MASHES addresses the development of a novel intelligent and self-adaptive system for continuous and autonomous process control.

BENEFITS OF MASHES PROJECT

MASHES system expects to push forward imaging and RT closed loop control technology, as key enablers to achieve zero defects laser-based manufacturing. The achievement of MASHES goals will impact different sectors: from **metal transforming, to automotive or aeronautics.**

Besides **LMD and welding**, MASHES results may be also applied to a variety of **laser processes**: cutting, drilling, cladding, coating, hardening, marking, texturing or machining; and different **processed materials**: polymers, metals, glass, ceramics and composites.

MASHES will allow end-users increasing **competitiveness, and productivity**, thanks to:

- **Reducing times**, down to 25% less both in laser cladding and welding processing times.
- **Reducing laser cladding consumables** down to 50%
- **Configuration time** down to **80% less**, due to the cognitive control system.
- Embedded MASHES control system will make **negligible the percentage of the rejected parts**

