

# Project Consortium

Fraunhofer FIT  
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CNet Svenska AB  
Sweden

In-JeT ApS  
Denmark

Istituto Superiore Mario Boella  
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Valtion Teknillinen Tutkimuskeskus  
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Brazil

Federal University of Amazonas  
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**BEMO-COFRA**



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**Brazil-Europe MOnitoring  
and COntrol FRameworks**

# Innovative distributed framework



The BEMO-COFRA project aims to develop a framework which strengthens networked monitoring and control of large-scale complex systems

The framework will be deployed in an actual car manufacturing plant where dependability of the system is of utmost importance and where a very large number of devices, systems and Wireless Sensor and Actuator Network (WSAN) devices interact, actively cooperating with each other to attain a very accurate observation of production processes.

## *Integrating objects, devices and subsystems*

The framework integrates heterogeneous smart objects, legacy devices and subsystems with the possibility of cooperating to support holistic management and achieve overall systems' efficiency with respect to energy and raw materials.

## *Adopting large-scale networks*

The framework enables the adoption of large-scale networks composed of heterogeneous smart objects provided with sensing and actuating capabilities. It is able to meet specific monitoring and control application requirements in terms of quasi-real time or real-time constraints.

## *Service-oriented architecture and middleware*

BEMOCOFRA uses a Service Oriented Architecture (SOA) and a middleware able to expose smart objects, legacy devices and sub-systems' capabilities by means of web services thus supporting syntactic and semantic interoperability among different technologies coexisting in the overall monitoring and control framework.

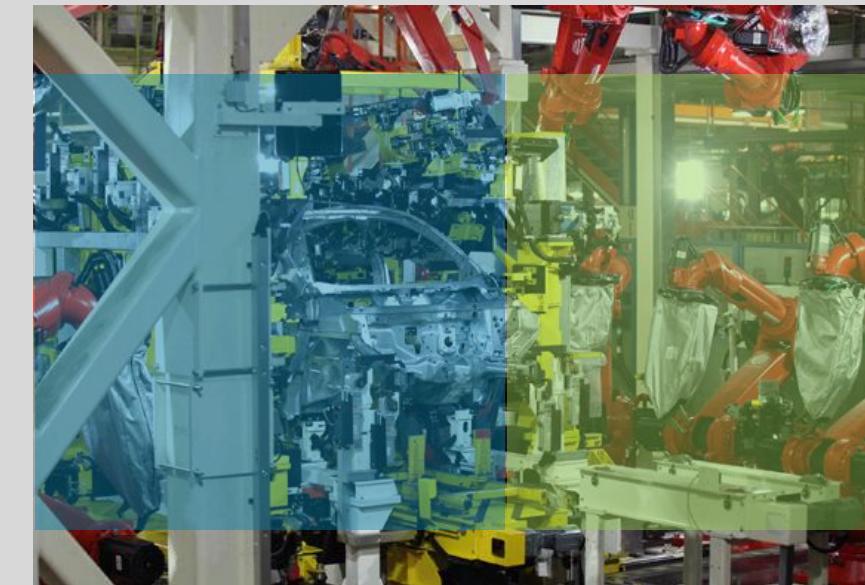
# Project vision

The aim is to promote a wider adoption of large-scale networked monitoring and control solutions by addressing technological aspects and user needs

This includes:

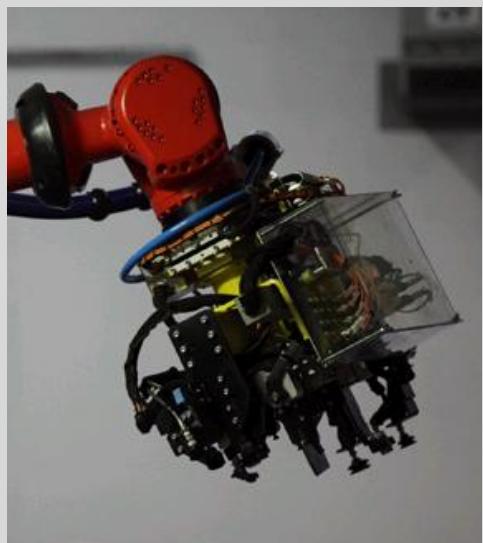
Defining novel mechanisms to enforce dependability in WSANs operating in harsh environments and serving heterogeneous application constraints by means of context awareness, self-configuration and self-adaption capabilities.

Adopting distributed and decentralized approaches to provide WSANs with scalable monitoring, control and self-diagnosis capabilities.



Introducing a Service Oriented Architecture (SoA) and a middleware that, by exposing smart objects capabilities as web services, makes it possible for the innovative WSAN developed within the project to cooperate with legacy devices/systems thanks to semantic interoperability.

# The first Brazil-EU project of its kind



## The manufacturing plant

In the car manufacturing plant provided by Comau and the Fiat Group, the framework will demonstrate that it can:

- Enable dependable, flexible domain-specific monitoring and control operations based on large-scale WSAN infrastructure
- Support an effective management at both device and networking level of large-scale WSANs adopted for monitoring and control purposes
- Enable interoperability and interaction among heterogeneous sub-systems
- Promote complex systems' efficiency by leveraging on the physical processes information and on the networked actuating capabilities

The BEMO-COFRA project joins European and Brazilian businesses and universities as part of the first coordinated call between the EU and Brazil

The collaboration is expected to have potentially significant impact on industrial production processes as well as generate new knowledge and experiences between EU and Brazil.

