Bournemouth University
Service oriented computing group

Undergraduate Project 2016-2017

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EUROPEAN UNION
Horizon 2020 - FIRST (734599)

Project title: Virtual manufacturing services

Background

This project is proposed in the context of the FIRST research project

Uber, Amazon, AirBnB, Netflix… The Internet has had many impacts on the economy. Not only on the consumer market, but widely across the service sector. There is a large amount of integration and automation to enable things like instant order confirmations. Work in these aspects of business processes is quite well established in the service sector.

Manufacturing is a key part of the economy. To remain competitive or become even more so, automation that supports innovation is also essential for the manufacturing sector. Advanced ICT supported manufacturing is currently gaining a lot of traction with initiatives such as Industrie 4.0 in Germany, Factory of the Future in Italy and the High Value Manufacturing Catapult the UK. Part of this development is advanced coordination of manufacturing allowing for increased flexibility and reduced costs. A virtual factory ensures exchange of data between smart machines, systems, software and design within the manufacturing chain. Manufacturing processes become more simple through plug-and-play techniques.

Project description

As part of research on virtual factories it is necessary to have simulated manufacturing services. There are many possible manufacturing services (wrapping machines) with various properties and constraints. In principle an API is sufficient, but visualisation of the "activity" has much added value.

Project aims

- Determine the properties of a real device
- Create a virtual manufacturing service simulating that device
- (Create a visualisation for the activity)

Example machines: 3d printing; packing; palletizing; mass customization (like moto maker); etc.

Research question

How can a manufacturing device best be simulated?

Additional aims and objectives

Artefact

- Executable simulated manufacturing service
- A testing system for the manufacturing service (eg a web interface)
- The artefact should be released under an open source license

Evaluation

- How easy is it to deploy the service?
- How flexible is the simulation (can you easily configure the simulation for different properties)?
- What is the API quality? How easy is it to write the testing application?
- How true to live is the simulation