# Fortissimo Success Story

# Data analysis to improve the welfare of laboratory animals

## ORGANISATIONS INVOLVED

Tecniplast is an Italian company which is a worldwide leader in the laboratory animal industry, providing solutions and services to support research.

Moxoff is an Italian SME with a deep knowledge in data intelligence and mathematical/numerical modelling.

CINECA is one of the largest High Performance Computing (HPC) centres in Europe, eager to facilitate external access to its systems for industry and SMEs.



## THE CHALLENGE

Any form of human inspection of laboratory animals used for research will disturb their environment. This may cause stress to the animal and potentially affect the results of the research. Measurements made by humans may also be inaccurate. There are two types of measurements: research measurements and measurements that must be made to care for the animals.

A system that would provide quantitative measurements of animal health status and activity would allow the company to see accurate information about the overall health of the research population, deal with issues as they arise, and support ongoing research.
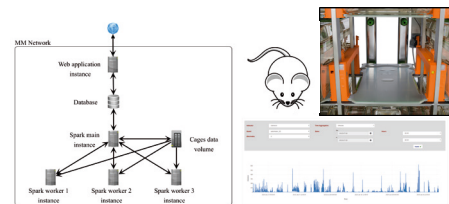


## THE SOLUTION

A measurement system was developed which uses a variety of sensors to provide real-time tracking of lab animals. Moxoff developed an HPDA platform on an HPC infrastructure, implementing algorithms which process all the raw data recorded by the sensors of Digital Ventilated Cages, a Tecniplast product. This can then be used for automatic event and anomaly detection, interactive data exploration, and analysis. As the system incorporates potentially thousands of sensors, depending on the number of animals in the study, cloud-based HPC infrastructure was necessary to cope with the amount of data the system generates. The real-time nature of the system is also a key reason why HPC was considered necessary, as other computing solutions would not be fast enough.
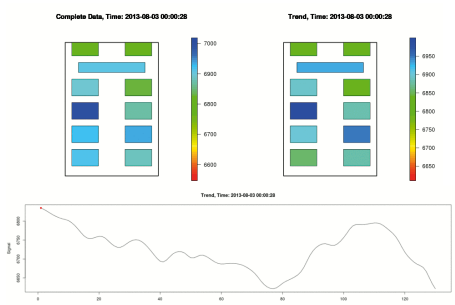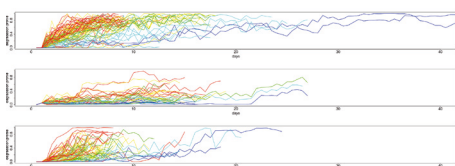


## BUSINESS IMPACT

The offering of a unique product will allow Tecniplast to increase its current market share and to expand its customer base. As there is a very large potential market, this would be one of the most important data analysis services ever provided by Moxoff. By continuing their partnership, Moxoff and Tecniplast will be able to offer new services to Tecniplast customers.

The platform developed in the project will also be able to be extended to apply to many IoT contexts and markets. Automatic identification of states and trends, user behaviour profiling, predictive maintenance etc. are topics that are increasingly requested, due to the exponential growth of connected devices.
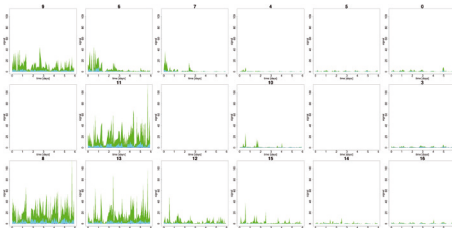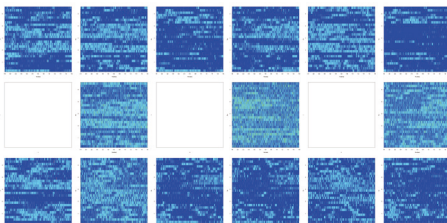
Besides acting as the provider of choice for the platform when the workflow will be implemented at a production-ready level, CINECA will benefit from the success story obtained with this Experiment to target SMEs in the HPDA market.

## BENEFITS

- Tecniplast expect to increase revenues by over €800,000 per year, with a gross margin of 90%.

- Tecniplast also expect to increase their market share, as they can now offer a much more competitive service to clients

- Potential opportunity to enter a new market for Moxoff and CINECA.

## THE FORTISSIMO PROJECT

Fortissimo is a collaborative project that enables European SMEs to be more competitive globally through the use of simulation services running on a High Performance Computing cloud infrastructure. The project is coordinated by the University of Edinburgh and involves more than 100 partners including Manufacturing Companies, Application Developers, Domain Experts, IT Solution Providers and HPC Cloud Service Providers from 14 countries. These partners are engaged in over 90 experiments (case studies) where business relevant simulations of industrial processes are implemented and evaluated. The project is funded by the European Commission within the 7th Framework Programme and Horizon 2020 and is part of the I4MS Initiative.