Successful Cases of Knowledge Transfer (Examples)

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Start-ups using CERN Technologies

Accepted into BIC in 2016 Current BIC Incubatees

Camstech LtD

InnoCryst

COLNEC HEALTH

Ross Robotics

TI\D

CROFT Additive Manufacturing

TERABEE

18 start-ups & spin-offs using CERN technology

B-RAD

Initially developed for use by CERN's radiation protection group and the fire brigade.

Portable radiation survey meter uses innovative solutions based on silicon photomultipliers to continue operating in the presence of high magnetic fields.

From lab to product in collaboration with the Italian company Else Nuclear.

Else has already concluded two contracts for sale of units under a licence granted by CERN.

FLUKA

Particle transport and interaction simulation code, originally developed by CERN and INFN for particle physics.

In 2016, FLUKA was used to study the possible advantages of radioactive beams of Carbon 11 or Oxygen 15 for hadron therapy.

Assistance was given to external collaborators at CNAO (National Centre of Oncological Hadron therapy, Italy), in particular for the new features essential for therapeutic exploitation of Helium beams.

Power Converters in Extreme Conditions

Powering the LHC's magnets requires precise control of the high currents that generate the magnetic field.

These converters have embedded control systems which communicate with other devices over a network.

In 2016, the Italian company OCEM Power Electronics signed a knowledge transfer agreement with CERN to gain valuable expertise in the design of power converters with new markets in sight.

Picosecond Synchronisation
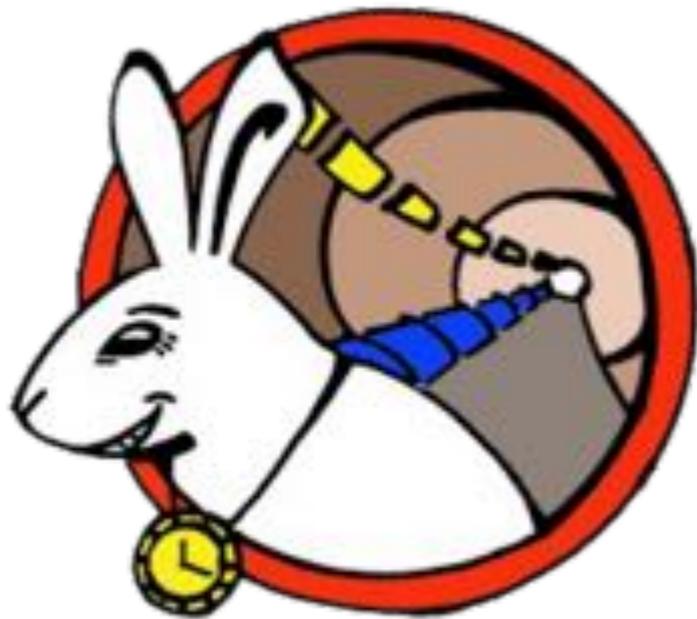
At CERN, particles circle the LHC over 11000 times per second.

This means components in the accelerator complex require minute timing accuracy and synchronisation down to 10 picoseconds. .

White Rabbit is a protocol developed at CERN for monitoring and controlling devices based on industrial networking technology, made available as open hardware and open source software.

In 2016, the technology attracted attention for its applicability in the field of smart electrical grids that have accurate synchronisation needs, where individuals and companies are no longer merely consumers of electricity but also co-creators.

White Rabbit is currently being tested on the smart grid of the Milan financial district.

Camstech: Electrochemical Sensors for Water Pollution Measurement

The start-up Camstech Ltd, which joined the STFC-CERN Business Incubation Centre in 2016, is the result of such serendipity after realising that CERN's unique process for making small micrometric holes in printed circuit boards in a predefined pattern.

It was exactly what the company needed for a tiny ultrasensitive biochemical sensor.

the sensor allows for a very accurate measurement of dissolved oxygen in liquids, which is one of the key indicators of water quality. A commercial low-cost version of the sensor will make precise water quality measurement more accessible worldwide..

Sensor Technology on Drones

The French start-up Terabee uses CERN sensor technology and started off providing aerial inspections and imaging services by deploying drones.

In 2016, the start-up, among others, won the prestigious first place in the automation category of STARTUP WORLD at AUTOMATICA.

Industrial Control and Automation

For over 15 years CERN engineers developed a software tool to integrate powerful JavaScript visualisation libraries within WinCC Open Architecture .
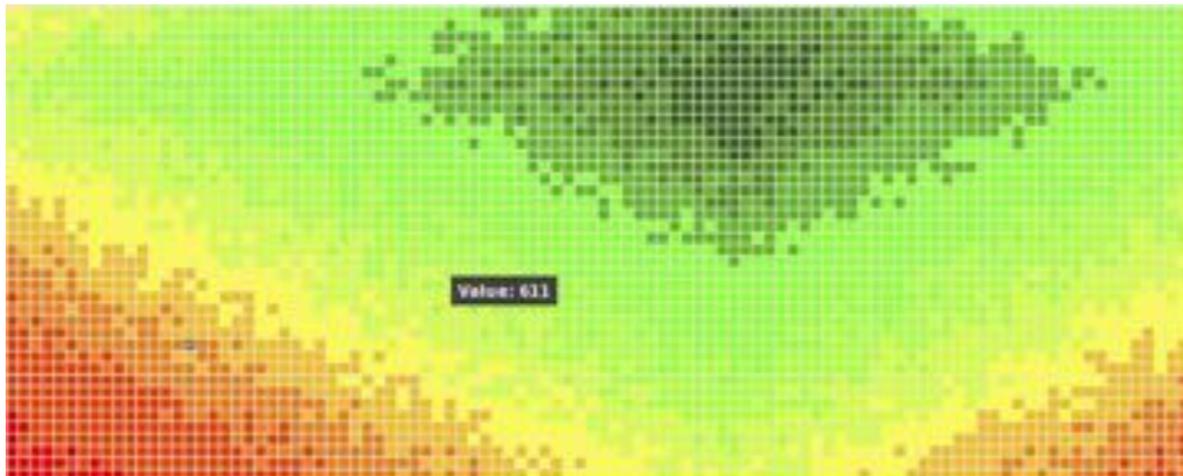
In March 2016, CERN signed a knowledge transfer agreement with the company ETM, a 100% owned subsidiary of Siemens AG.

ETM develops SIMATIC WinCC Open Architecture (WinCC OA), a Supervisory Control and Data Acquisition (SCADA) software that is used in industrial control and automation in a broad range of industries.

FOSS4 Irrigation: how can high energy physics help with water shortage?

Since 2016, CERN is part of a research project to develop a system for optimised irrigation, based on technologies developed for high-energy physics.

The irrigation system will use fibre-optic sensors designed to measure parameters such as temperature, humidity, concentration of pesticides, fertilisers and enzymes in the soil of cultivated fields..

The fibre humidity sensors are based on those developed for the CMS experiment at CERN's Large Hadron Collider..

The research programme was launched by the UK Lebanon Tech Hub (UKLTH), which is funding the project and coordinating the different participating institutes and companies.

Many more successful cases at

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