



# celtic-Plus<sup>+</sup>

Smart Connected World

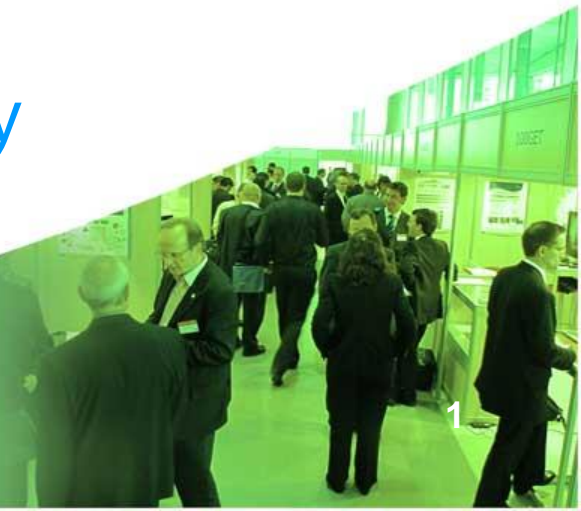


# Celtic-Plus Proposers Day Antwerp, 28 October 2015 Pitch Abstracts

[www.celticplus.eu](http://www.celticplus.eu)



#Celticpropday



# Proposal Ideas Overview

1	<b>SooGREEN Consortium extension</b>	Valerie Blavette	Orange	France
2	<b>Take advantage of mobile waves, WIFI...and the Telcos's data for the environment</b>	Valerie Blavette	Orange	France
3	<b>Secure and accurate road weather services composed from vehicle and RWS data</b>	Patricia Ortiz Ugalde	Innovalia Association	Spain
4	<b>Smart City Micro Services</b>	Steven Van den Berghe	Sirris	Belgium
5	<b>digiPIL - the Digital Patient Information Leaflet</b>	Peter Stollenmayer for Alex Vakaloudis	Cork Institute of Technology	Ireland
6	<b>Big Data for Earth Observation</b>	Sébastien Levèvre	Université Bretagne Sud	France
7	<b>NETAS and Safety Management in Underground Work Environments (WINS@HI)</b>	Ayse Belma Kaya	NETAS	Turkey
8	<b>5G connected cloud-based video analytics</b>	Cornelius Hellge	Fraunhofer HHI	Germany
9	<b>SHAAPING - Support of Healthy Ageing</b>	Stefan van Baelen	iMinds	Belgium
10	<b>From packet to info-oriented networks</b>	Dimitri Papadimitriou	Alcatel-Lucent Bell N.V.	Belgium

## Service Oriented Optimization of Green Mobile Networks

### SooGREEN objectives

- E2E Services (OTT, P2P, Web browsing, IOT/WoT) power consumption for network architecture, user equipment, and datacenters
- Services ( VoLTE, M2M, IOT) network and caching Performance Optimization, including VRAN
- Service Delivery Interaction between mobile networks and smart-grid: services adaptation, demand-response, renewable energy business model to evaluate investment opportunities
- Technical Environment optimization for base stations (power conversion, power back-up) and central offices (cooling)

SooGreen was labelled as Celtic Plus project on 14 November 2014

The project activity has just started: 1st July 2015 up to 30th June 2018

Looking for the following additional expertise to enhance the current consortium:

- Industry, Telco, SME, University/Research
- New kind of services: OTT, P2P, web browsing, IOT/WOT, VoLTE, M2M, D2
- Mobile Network: Optimization of Radio Access Network and Content Delivery solutions, Energy consumption in Virtual Radio Access Network
- Energy : Interaction between service delivery in mobile networks and smart-grid

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# Take advantage of mobile waves, WIFI...and the Telcos's data for the environment



## **Mobiles Waves...for forecasting pollution, weather...**

Measuring rainfall with mobile phone networks is already used: The electromagnetic signals transmitted from one mobile telecommunication antenna to another are attenuated by rainfall.

The rise and fall of signal strength in each "link" provides an average measure how much rain is between them.

With the new range of wave length (5G...lower wave length than 4G), it can be worthwhile to look for: new use-cases (air pollution sensor), improving existing ones (weather predictions)

## **Local Waves (WIFI)...for health**

It seems that WIFI could be used for cardiac tracking. Therefore, use-cases with local waves could be also researched.

## **Various sources of data (Local waves, Mobile waves, IoT's data)**

could be combined to reinforce the identification of a phenomenon

E.g. air pollution by crossing the analysis of mobile waves with the analysis of the heart rhythm (or others personal signals through local sensor)

Beside their usual business (voice, data), the Telcos could take advantage of:

- their network (global and local) and also the future IoT network
- their ability to gather and analyse a huge and various amount of data,
- ... to bring new services to the society in relationship with hot issues (environment, health)

*Because network is deployed and the data centers are operational  
it could be a big opportunity with low investment.*

Main competences: transmission, radars, signal processing, data mining,  
big data analysis

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# Secure and accurate road weather services composed from vehicle and RWS data

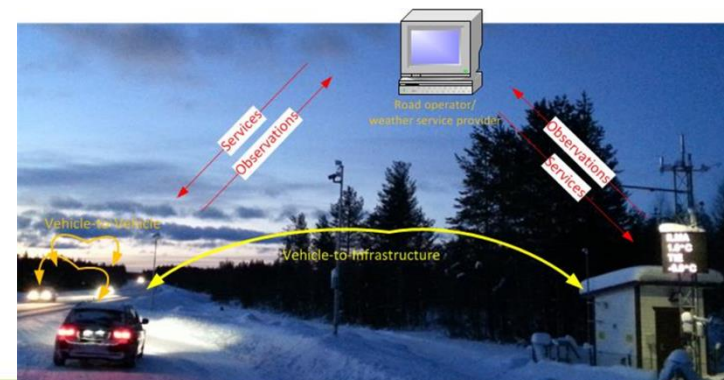
## Objectives:

- In suburban road areas, there are some dangerous hot spots depending on dynamic weather conditions; local large predictions are needed
- Sources: Roadside units (RSU) and combined roadside units, Road weather stations (RSU/RWS), Additional instrumentation in vehicles
- All vehicles could take benefit, including the ones not equipped with CAN-bus readers, OBUs or Internet access.
- A system allowing to warn any driver with practically any kind of on-board instrumentation
- Security mechanisms in place (user privacy and content protection to unauthorized access and modification)

## Expertise needed:

- Meteorological specialists both for large prediction and for computing local prediction using various vehicles and RSU data combined with large predictions.
- Vehicle manufacturers / Vehicle OEM manufacturers
- Cities and Road authorities
- Sensor manufacturers
- Network operators
- School bus companies and truck operators

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# Smart City Micro Services

*What if we could connect, understand and interact with individual things at the scale of a city; and use this to implement common goals (e.g. energy saving, transportation, ...)*

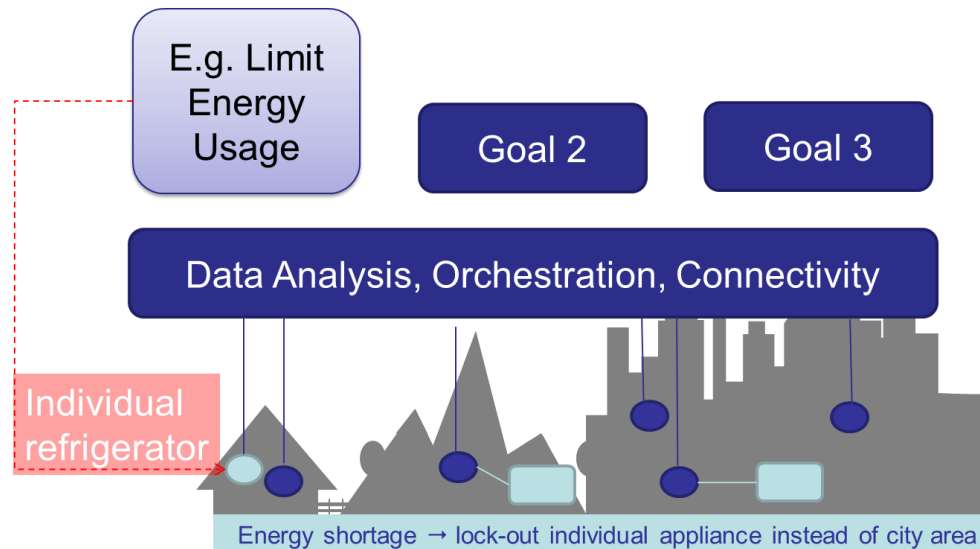
1. Platform for Decision making on large scale heterogeneous IoT deployments.
  - Heterogeneous Behaviour
  - Heterogeneous Connectivity
  - Heterogeneous Goals
2. For things & people (e.g. mobile interactions)



Potential topics:

- IoT connectivity
- IoT platform services
- Data analysis, simulation, visualisation, predictive models

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## **Goal: Replace Patient Information Leaflets (PIL)**

- Public Health - Easy access to critical medicines information (during the course of treatment)
- Patients, Physicians, Pharmacists - Improvement in patient compliance, Increased reporting of Adverse Drug Reactions, No interruptions to medication supply
- Pharma companies - Simplification of supply-chain, Improved Pharmacovigilance through increased ADR reporting and tackling of counterfeit medication

## **Outcome:**

- Recommendations for digital PIL delivery based on user-testing and field trials
- Development of platforms to digitise PIL delivery and improve effect of medications

## **Impacts:**

- Increase patient awareness of critical medicines information
- Improve patient compliance with dosing and administration
- Changes to EU Regulations

**Schedule:** 12-24 months

## **Looking for:**

More Pharmaceutical companies - Access to electronic PIL, Project support/Endorsement

NGOs - Use cases, pilot studies

Regulatory Authorities - Project Endorsement and Collaboration

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- Vision:** Earth Observation is today in the Big Data era
- Motivation:** Big Data from Space becomes real but technological challenges remain
- Content :** efficient access to EO data  
data pre-processing  
data mining  
visual analytics  
evaluation methodology  
validation (use cases)  
towards exploitation (sustainable architecture and services)
- Outcome:** Technological advances in IT that will support EO data/market growth
- Impact:** New technologies, new services for a fast growing market

**Looking for partners/expertise in:** SMEs, Major IT companies, academics (if complementary skills)  
Infrastructure for big data, EO-related use cases, Technologies for data analytics

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# Wearable IoT Network Solution for Work Safety in Hazardous Industrial Environments (WINS@HI)

## Main Goals:

- Assessment of Risks and Preventing Accidents
- Improving Work Safety of Underground Workers
- In Case of Occupational Injuries and Hazards:
  - Tracking Location of Workers
  - Remote Health Monitoring
  - Guiding Emergency and Rescue Units

## Content:

- Wearable Sensor Networks
- Wireless Underground/Indoor Communication
- Data Analytics
- Network Anomaly Detection and Monitoring Algorithms
- Disaster/Emergency Management

## Status:

Project ([WINS@HI](#)) is labelled and about to start

## Use Cases:

Mining Industry, Tunnels and Subways, ...  
Pre-Accident (e.g. health monitoring, location tracking, gas sensing,  
Post-Accident (e.g. guiding rescue teams, location detection)

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# 5G connected cloud-based video analytics

## Project vision

- 5G + video compression technologies (HEVC) + adaptive streaming
- Enabler for robust mobile transmission of video data from large number of video sensors to the cloud
- Cloud + machine learning
- Enabler for large scale video understanding

## Project focus

- Evaluate 5G specific features for high capacity and mobile links closely following 5G standardization: M-MIMO, Network slicing, low latency
- Research on interaction between video compression, adaptive streaming, wireless link, and machine learning algorithms
- Develop use cases and business plan

## Expected outcome

- Solution for secure, reliable, and adaptive mobile video analytics over 5G mobile links
- Develop business cases
- Facilitate use cases by new technologies and bring them closer to the market
- Contribute to standardization

## Schedule

- Proposal submission e.g. to next call in 2016
- Duration 3 years (Closely linked to 5G standardization timeline)

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# SHAAPING



Support of Healthy Ageing through big data Analysis and multifactorial intervention on Preventing development of frailty in Pre-frail older population

*Development and deployment in elderly living environment of an open and scalable framework to prevent the frailty and launch appropriate interventions to mitigate the potential risk*

## **Context:**

- By 2050 population 60+ is expected to reach Worldwide: 2 billions; EU: 150 millions, 80 millions in 2008

## **Frailty:**

- Progressive decline of healthy and independent living; Affects 15-20% of individuals 65+.
- It can be reversible: early detection + appropriate intervention

## **Expected Impact:**

- 20% reduction of hospital admissions help people to remain healthy and maintain their independence at home;
- Reduction the healthcare and care cost and improve the quality of life of family and relatives

## **Innovation:**

- Development of large scale steaming data analysis tools
- Development of an open, interoperable and scalable platform dealing with sensitive data and privacy and ethic aspects
- Characterization and detection of pre-frail persons: launching appropriate interventions to mitigate the potential risk

## **Targeted market:**

- Products and services for Ageing well
- Silver Economy: \$7 trillion per year (3rd largest economy in the world)
- 3 trillion euros is the wealth of 65+ in EU

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# From packet to info-oriented networks

## Project objectives

Explore first order principles and network models to “design” info GTW

## Main challenges

1. Universality and genericity® target replacement or “overlay”
2. Remove dependence on dest. locator-based only exchange  
⇒Rethink localization function (e.g. information grouping)
3. Dynamics in spatial distribution of information without specialization (host vs. network nodes)  
⇒Principle of performing routing decisions before "localization“ becomes inefficient if ever achievable (#routes ~ #data objects)

## Project structure and expertise:

- Step 1:     - Skills: TCS, comp./alg. learning theory, comp. intelligence (EA)  
              - Task: procedures, algorithms and proofs  
              - Outcome: theoretic validation
- Step 2:     - Skills: stat. inference, data-driven/unsupervised ML, optimization (combinatorial, continuous, robust)  
              - Task: programs and numeric evaluation  
              - Outcome: alg. design choices and performance evaluation
- Step 3:     - Skills: software development (HL), experimental evaluation  
              - Task: develop abstract protocol model/components  
              - Outcome: demonstrator

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