CROSS-CPP

Creating access to sensor data from various industrial sectors to enable new dimension of innovative business ideas

NEWSLETTER, ISSUE #2

CROSS-CPP

ECOSYSTEM FOR SERVICES BASED ON INTEGRATED CROSS-SECTORIAL DATA STREAMS FROM MULTIPLE CYBER-PHYSICAL PRODUCTS AND OPEN DATA SOURCES

Letter from the Coordinator

By Christian Wolff
ATB

We started the Cross-CPP project with very challenging objectives in mind: i) to make the data streams coming from mass products, such as vehicles and smart building automation systems, accessible via a one-stop-marketplace, ii) enabling the wide community of service developers to establish new innovative business ideas and iii) to strengthen Europe's position as a provider of innovative Big Data ICT services.

Meanwhile it's half time since we have started the Cross-CPP adventure, in a path full of challenges that is being cleared up thanks to the determination and commitment of all consortium partners: five research and development partners experienced in Big Data and AI, Marketplaces and Privacy, two leading mass product manufactures from different sectors and a very innovative service provider.

During the first half of the project, the consortium has collaborated in defining and developing early prototypes for all the main modules and services of Cross-CPP: a standardized cross industrial data model (flexible enough to incorporate data coming from various industrial sectors) as well as cloud storage implementing this model; a data customer oriented Data Marketplace including a big data analytics toolbox providing easy to use analytic functionalities; a secure framework (ensuring trust and privacy of data); and a set of innovative cross-sectorial services (the focus of this newsletter).

We have also had the opportunity to present our views on the one-stop-shop marketplace for cross-sectorial data streams, as well as on innovative cross-sectorial services at influencing Big Data events (BDVa meet-up in Sofia and the Big Data Value Summit in Riga) and on several scientific conferences, where we have received valuable feedback from researchers and potential end-users of the Cross-CPP solution.

By the second half of the project, we will finalize the implementation and integration of the solution and its validation and assessment by data providers and data customers. We expect to tell you about this success story in the upcoming newsletters.

I hope you enjoy the reading!

In this issue

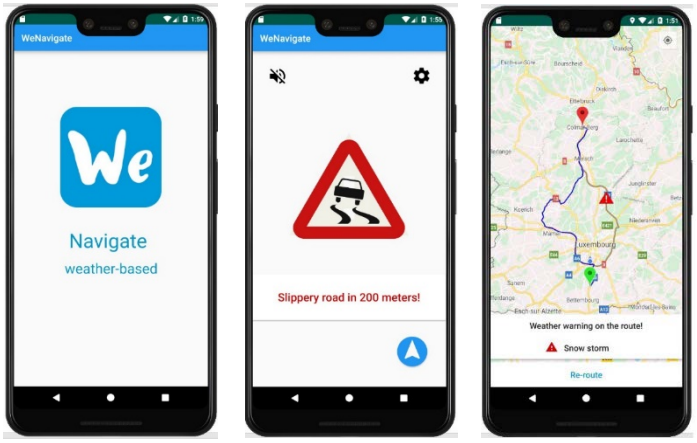
Real time drivers warning and weather-based navigation Service

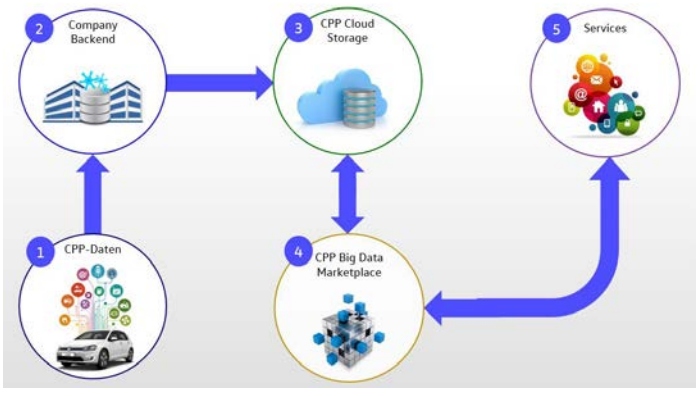
The Cross-CPP project will pave the way for many new apps and services.

For example, could you imagine that your vehicle could predict the weather for others? Or at least contribute to making weather forecasts? While you are on the road in your Volkswagen, your vehicle provides you with a range of information: For example, it shows you the outside temperature and a sensor calculates the amount of rainfall to adjust the windscreen wipers accordingly. If necessary, the electronic stabilization program (ESP) may warn you. This data is useful, but it can become even more useful when it is combined with the data from other vehicles:

With this data, we can create forecasts for your planned trips. If data from other vehicles indicates potential hazards, the system can even suggest an alternative route. A true milestone on the road to autonomous driving!

Sounds handy? This is how an application based on the Cross-CPP project could look like: The project connects data from different industries. Siemens is one of the companies, alongside Volkswagen, that participates in this research and innovation project and provides information in the fields of building automation and charging infrastructure.





The chart illustrates the process:
1) Product manufacturers and other partners generate and transfer data.

2) Data is then converted into the uniform CIDM format.

3) Data is stored in the cloud and available anytime.

4) Depending on the type of service, different sets of data will be provided and used.

5) This is how we create applications and services with many benefits for you and others.

The fact that the data will be used by different cooperation partners and stored in a uniform format offers many new opportunities. From useful to entertaining, many things will be possible. Finding a charging station for an electric vehicle and displaying the remaining charging time are just two out of many possible options.

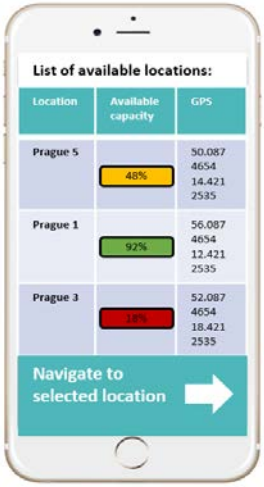
SIEMENS
Ingenuity for life

Early Prototype of E-Charging Service

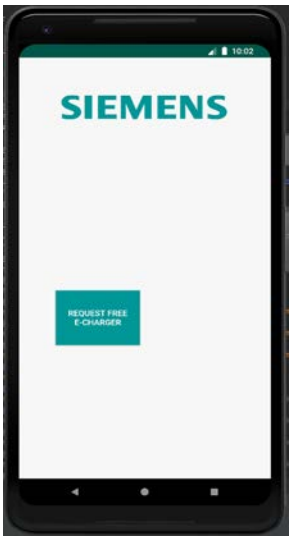
Main thought of the service is to exchange information among data providers related to “E-Charging”, meaning vehicles will be providing information about its battery status and other information relevant during the charging process, buildings about its e-chargers infrastructure – free charging locations and constraints.

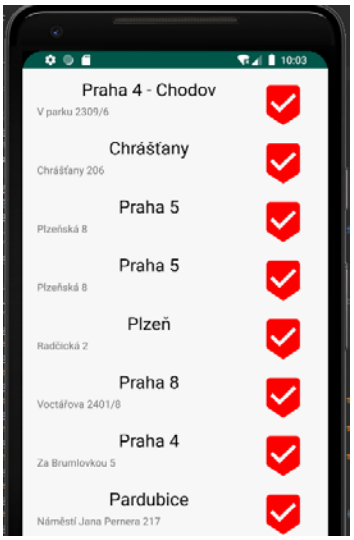
The idea of this service is to send simple information about the presence of charging station inside of the building or located outside (public parking lot, airport, hospital) to the vehicle.

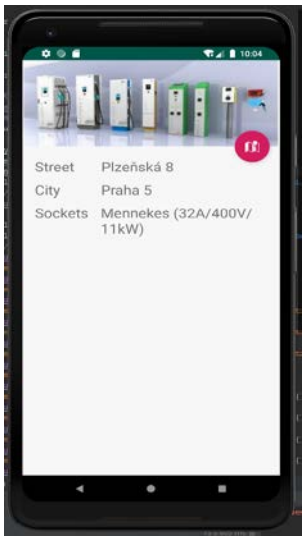
Furthermore, using real-time data in the communication online with the car / building about occupancy of e-charges placed outside of the building or inside (in the garages) in a way that the vehicle would send out its own information about its capacity of the battery. This together with its current position and speed could possibly calculate time of arrival and to reserve an e-charger for this specific car.



Based on information about battery capacity, the building will be able to calculate the time needed for full charge and then to reserve an e-charger for other interested parties.







Initial page of the application is shown after the user launches the app. There is the logo of the Service provider, and a simple button for requesting a free electricity charger. By pressing the button, the application evaluates available e-charges and displays as in this way generated list for the user. For the full prototype there is intention to consider current gps position of driver, vehicle data (battery capacity left, consumption, plug type,...) together with data coming from buildings/e-charges (e-charger occupied, plug type, available power for charging,…) with evaluating those information, customer will be provided only with relevant e-charges that suit him the best.

The list of e-chargers shows their availability and address. If the user chooses such an e-charger and clicks on the button in down right corner, the navigation to desired location will be started.

By choosing one location and holding chosen row for a few seconds, another screen with city, address and type of socket of e-charger will pop up. This way the user can double check its compatibility with his vehicle.

Meteologix AG

Business Case

Within the H2020 project 'Automat' we could demonstrate that meteorological data from car sensors can significantly contribute to the initialization of our Swiss SuperHD 1x1km weather model and enhance its resulting forecast.

In order to facilitating CPP data ingestion into our weather model, we need to further increase its spatial resolution, especially when used for forecasts of metropolitan areas. Thus, within Cross-CPP, the goal is to design and apply a new weather forecasting system with a horizontal resolution of 100x100m – the UltaHD.

This high horizontal and vertical resolution makes it possible to explicitly simulate the air flow conditions and resulting meteorological features within its boundaries (e.g., temperature difference between dense building quarters and city parks), as well as processes like boundary layer clouds and turbulent mixing to be explicitly resolved. The new UltraHD has been »nested» into the SuperHD 1x1km model and was setup for the area of Berlin.

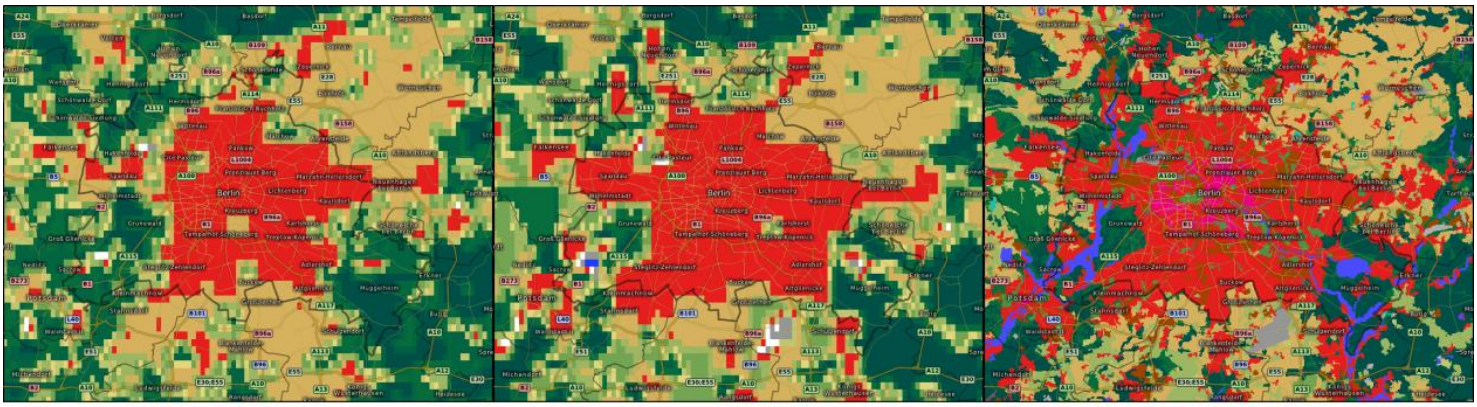


Figure 1 shows the comparison of the 20-classes land use in the 1x1 km SuperHD model (left) with an updated version on the same grid and same class size used in the new SuperHD model version (center). The right-most image then shows the 100x100m grid of the urban weather model, created from the same dataset.

In order to be able to represent the urban weather as accurate as possible, a major prerequisite is using an up-to-date, high-resolution land use dataset. Such data describe which type of surface is found at each pixel of a grid. Typical land use classes comprise urban/built-up structures, different types of forests and agricultural areas, as well as water surfaces.

Urban areas modify the local weather ("microclimate effect"), it is therefore essential for forecasting localized flow features to have both an exact localization of e.g. sealed/non-green districts as well as a matching average distribution of roughness and other surface properties across the whole domain.

Meteologix has also worked on a solution to built a «Pseudo-Radar» image from live rain intensity sensors from driving cars. These kind of maps could help enhancing the weather data infrastructure in countries, that lack weather radars/

Cross-CPP dissemination

The Cross-CPP key ideas and the early development work have been presented in several relevant events and for various audiences:

- An article in the Czech edition of the Computer journal (May 2019)
- Big Data Value PPP Meetup in Riga (June 2019)
- AI Expo Korea in Seoul (July 2019)
- European Big Data Value Forum (will take place in November 2019)

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Next steps

We entered the second half of the project in June 2019. We have gone through multiple achievements during the first half, especially finishing the Cross-CPP Early Prototype, but the coming months will again bring a number of important milestones like the final specification documents, full prototypes and their testing and final assessment, as well as the report on the Cross-CPP methodology for using integrated data streams from cross – sectorial CPPs and exploitation and dissemination plans.

During the coming period, we will also intensify our work towards involving interested external parties (through UIG – the user interest group), will precise the business scenarios analysis (cost modelling, pricing models, etc.) for operating a B2B data Marketplace and to involve relevant European stakeholders that would benefit from to project results and extend the pool of commercial services built around the project results.

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More information in https://cross-cpp.eu/

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