MONICA

MANAGING LARGE, OPEN-AIR EVENTS IN THE CITY

TECHNOLOGY SOLUTIONS FOR NOISE CONTROL, SECURITY AND USER EXPERIENCE

The MONICA Project is a large-scale demonstration of how cities can use IoT technologies to meet sound, noise and security challenges at big, open-air cultural and sport events, which attract and affect many people. Several applications are deployed at large events in six European cities from 2017 to 2020, involving more than 100,000 application users in total, out of which 10,000 will participate in the evaluation process.

ENHANCE SOUND PERCEPTION AND REDUCE NOISE

Sound zones are established at open-air concerts to enhance the sound experience for concertgoers and performers while at the same time mitigating the noise for neighbours. The sound levels are displayed for monitoring and control purposes.

People attending the concert or affected by it can also monitor the sound levels on their smartphone, whether it reflects a wish to move to a quieter spot or to assess compliance with noise regulations.

IoT= Internet of Things: Advanced wireless technologies connecting physical devices to the internet and making it possible to collect and exchange data and perform actions. Devices used in MONICA include smart wristbands, video cameras, loudspeakers, airships, smart glasses and mobile phones.

STRENGTHEN CROWD SAFETY AND SECURITY

Applications involving the use of cameras, tethered airships and wearables will enable security personnel to capture real-time data about crowd size and density for the purpose of analysing, predicting and handling emerging incidents, while being compliant with personal privacy provisions and rights.
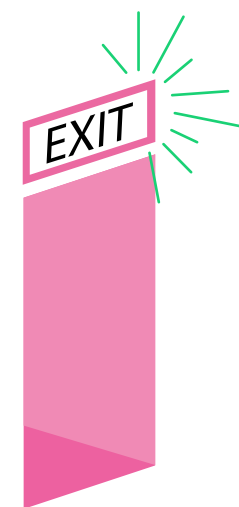
An operational picture of the security situation is displayed on a graphical user interface, notifying the staff of any unusual behaviour, providing decision support and enabling timely information-sharing between security staff members.

IMPROVE USER EXPERIENCE

Communication to customers, crowds and citizens is improved by the use of mobile apps and IoT wristbands with value-adding features, enabling people to interact with and locate each other, informing visitors of the best place to park, the best way out or the bars with the shortest queue, and guiding participants to the nearest exit in case of an emergency. General data such as on sound levels are made accessible as open data on the hosting city's websites for citizen engagement and innovation.

EXIT

SIX CITIES, SIXTEEN EVENTS, SEVERAL APPLICATIONS

COPENHAGEN

Tivoli Gardens is a world-famous amusement park and pleasure garden located in Copenhagen. The focus in the MONICA Project is on four out of +20 Friday Rock evening concerts which are held during the summer season, attracting a total of 500,000 guests.

Due to its central city location with residential neighbours, several challenges will be addressed in regard to improving sound management inside the park perimeter as well as security matters related to improving crowd management and safety.

BONN

Two major cultural events have been selected by the City of Bonn for trialling MONICA solutions. The first is the open-air festival **Rhine in Flames** with up to 90,000 visitors per day. With three performing stages, the primary aim is to achieve the best sound experience for the visitors and performers with due consideration of the neighbours. The second festival is the five-day **Pützchens Markt**, bringing together 1 million visitors in a residential area with narrow streets. Here, monitoring of crowd movement and prevention of critical situations is key.

Headingly Carnegie Stadium / SWpix

HAMBURG

The **Hamburg Port Anniversary** and the DOM Festival are two well-attended open-air events that have been celebrated for years. During the Anniversary of Germany's largest port, more than 1 million visitors join the exciting atmosphere generated by ships from all parts of the world. Besides the Open Ship attraction, the Anniversary offers live music, funfair and food stalls along the waterfront of the River Elbe. **Hamburger DOM** is Northern Germany's biggest funfair with 7-10 million annual visitors during the 91 DOM days. The funfair takes place in the premises of the Heiligengeistfeld with a total of 251 attractions. For both events, crowd and noise management are important issues faced within MONICA.

LYON

Lyon hosts the famous light festival, **Fête des Lumières**, where the residents of Lyon celebrate the Virgin Mary for four days and the city fills up with performers and millions of visitors in the streets of the city centre. The second event involved in MONICA is **Nuits Sonores**: a huge electronic music festival which brings together DJs from France and from all over the world. For five days there are concerts, performances and shows in Lyon. Interest is in improving the tools for information sharing between security personnel and reducing noise complaints from citizens.

TURIN

The focus of Turin is twofold: a first happening is the **Movida nightlife** in the San Salvario District with bars, restaurants, shops and lively events. The aim here is to strike a balance between amusement, security and quality of public space.

The second happening is the summer festival **Kappa FuturFestival** that takes place every year with concerts and events in a residential area, attracting around 20,000 people with consequent problems of crowd management, security and noise propagation.

LEEDS

The iconic Headingley Carnegie Stadium in Leeds is home to **Yorkshire County Cricket Club** and **Leeds Rugby,** in 2016 attracting 158,000 and 258,000 visitors, respectively. In MONICA, the Stadium is looking to enhance the visitor experience at its matches through improved communication and day-to-day management of crowds.

The challenge for Leeds is the diversity of the visitors to the stadium due to the professional teams that play at the venue which now includes a women's professional cricket team - the Yorkshire Diamonds. The matches that will be selected to support the MONICA project will be representative of this diversity and include fixtures for Leeds Rhinos Rugby Super League, men's international and domestic cricket and women's KIA Super League.

THE TECHNICAL CONCEPT

To support the applications, MONICA deploys a cloud-based platform, wirelessly connecting and handling several IoT-enabled devices whether fixed, worn or moved around. Control systems monitor the data collected and can perform automated actions based on the information gathered. The platform also consists of components which analyse data and detect critical incidents, supporting operators in assessing the situation and making decisions. A strong toolbox for data security and trust management complements the platform.

The platform will be able to support multiple IoT applications for a smarter living and has a wide usage potential. Based on open standards and architectures, the platform can be reused across multiple use cases with only the application layer being specific to the deployment setting.

Features include:

- Integration of many different sensors, actuators, networks and data
- Open standards, protocols and architectures as well as Open Source
- Massive scale operation, demonstrated by 10,000 simultaneous end users
- Cost-efficient wearables and legacy smartphones
- Data Security, Privacy and Trust Framework, ensuring full data protection and privacy

MONICA WILL DEMONSTRATE THREE ECOSYSTEMS WHICH INVOLVE THE ENTIRE CHAIN OF STAKEHOLDERS AND THEIR NEEDS:

SECURITY ECOSYSTEM
Applications that can be used to monitor and manage security before, during and after an event
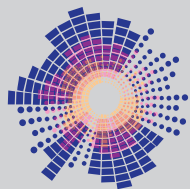
ACOUSTICS ECOSYSTEM
Applications that help monitor and manage the sound before, during and after a performance

INNOVATION ECOSYSTEM
Applications for public engagement and innovation based on open data and development tools

Bundesstadt Bonn / Volker Lannert

MONICA

Management of Networked IoT Wearables
- Very Large Demonstration of Cultural and Security Applications

29 PARTNERS, NINE COUNTRIES

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Tivoli A/S, Denmark

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VCA Technology Ltd, UK

Vaeksthus Zealand, Denmark

Yorkshire County Cricket Club Ltd, UK

Leeds Rugby, UK

SWEDEN (1)

DENMARK (8)

UK (6)

GERMANY (4)

NETHERLANDS (1)

SLOVAKIA (1)

FRANCE (2)

ITALY (5)

GREECE (1)

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