ITEA 3

Project Results

MOS2S

New forms of engagement in entertainment and society

EXECUTIVE SUMMARY

Traditional media is losing ground to personalised experiences. The ITEA project MOS2S (Media Orchestration from Sensor to Screen) has therefore developed applications for video and audio streaming, sensor analysis, emotion recognition and speech-to-text to help businesses and political players understand the desires of citizens and provide services accordingly.

PROJECT ORIGINS

Internet of Everything (IoE) creates both opportunities and risks. One example is the trend towards personalised media, which allows new forms of fan engagement but has also led to fake news through the uncontrolled pushing of content. To harness the benefits of new media, Internet of Things (IoT) technologies such as advanced wireless networks, cloud storage and data analysis can provide a basis for Smart Cities, with big implications for the live event production market.

The ITEA project MOS2S has developed audio-visual technologies and embedded them in a Smart City Playground. This is a location where infrastructure and crowds already exist (such as stadiums), serving as a testbed before technologies are rolled out to a larger metropolitan area. There are two sides to MOS2S: crowdsourced journalism and (sports) entertainment. As a venue platform to support proof-of-concepts, the focus was on technologies that allow data and media streams to be orchestrated into a coherent experience on various end-user devices.

Babbelbox lets citizens give feedback on societal issues

TECHNOLOGY APPLIED

The common denominator in MOS2S is the media processing platform, which combines multimedia streams from different domains. Based on these inputs, the platform acts as a broker for 10 applications. For e-democracy, there are four components: Babbelbox, Online Debate, Live Hangouts and Online Debate Replay. VRT's Babbelbox is a mobile booth which is set up at crowded locations and lets citizens give feedback on societal issues. Their opinions provide broadcasters with content for a live debate, while Gerade Software's Online Debate is a tool with an integrated moderator role and editorial dashboard to set up debates online.

Online Debate Replay allows editors to put the results of these debates into a form that can be broadcast, incorporating a number of innovations. ETRI's 360° Video Capture allows real-time geometric and photometric stitching of video at 30 FPS. TNO's Video Processing Platform (VPP) then provides cloud-based processing of these media files, using neural networks for image recognition, meta-data extraction and region-of-interest creation. This includes KoçSistem's emotion detection tool, a software library which can recognise mood, age and gender and seamlessly integrates into third-party applications. Nokia uses STT algorithms and the dataflow nodes in its own World-Wide Streams (WWS) platform to provide speech-to-text audio processing in almost real-time.

For sport, the PIXAGE Digital Publishing Application is a platform for controlling all screens and broadcast streams from a single centre. This covers an array of hardware specifications and its custom-built SOC Framework makes integration of new devices straightforward. Inmotio's wearable sensors serve as a Local Positioning Measurement system for players during matches and training, accessible through a web portal. GameOn

compliments this through an application for end-user devices, combining high-definition video with interactive options such as replaying goals.

MAKING THE DIFFERENCE

Technology-wise, MOS2S raises the bar in a number of ways. The WWS neural network operators, for instance, have an audio throughput of up to 30 times higher than the state-of-the-art, while the speech-to-text pipeline has decreased latency by a factor of ten. Media flow analysis is now done in near real-time instead of manually over the course of hours or even days. Sensors can also pinpoint player positions 100 times per second, allowing for enormously detailed analysis that can be utilised by coaches during each game.

Unique collaboration between SMEs is at the heart of ITEA's work. GameOn and Inmotio have demonstrated this through the implementation of their video and sensor technologies in the Johan Cruijff ArenA. The video technology has been licensed to 12 European clubs, with a revenue of almost EUR 700 thousand for GameOn in 2019 (versus roughly EUR 80 thousand in 2016). The Inmotio Performance Centre, meanwhile, is being rolled out for all 18 teams of the Dutch Eredivisie, potentially leading to millions of users following completion. As the first stadium in the world to adopt such technologies, the ArenA boosts its reputation for innovation and opens up a new consultancy market, in turn making the technology accessible to smaller clubs. MOS2S's commercial applications also fall outside sport: against 200 applicants, two of the three winners of a recent Eurovision innovation challenge were from this project. Ultra-Wide Vision and Live Hangouts - which has been integrated into Kiswe's CloudCast product - will thus be demonstrated during Eurovision 2020, reaching a likely audience of 200 million.

For the crowdsourcing technologies, success is measured by audience. As younger people are increasingly unengaged with traditional media, the social impact of getting their unbiased views is high: it encourages participation in the democratic process while providing a new form of journalism that can combat fake news. Online Debate Replay has now been implemented in Turkey. Now that MOS2S's applications have been tested in a Smart City Playground, the next step is to implement them on a wider scale to further revolutionise the role of citizens in both politics and entertainment.

MAJOR PROJECT OUTCOMES

Dissemination

- Over 15 publications
- Over 10 participations in international conferences/trade shows such as IBC, NAB, World Stadium

Exploitation (so far)

- New products:
  - Ultra Wide View live event broadcasting system
  - Cloud-based real-time video processing platform
  - Online debate platform
- Participation in Winter Olympics 2018 with Ultra Wide View solution
- Participation in World Cup 2018 with Live Hangouts solution
- Selected as a winner in innovation challenge Eurovision Song contest 2020
- Implementation of interactivity tools in the radio apps of the public broadcaster VRT
- Implementation of "Babbelbox" into TV shows

Standardisation

- Contributions to standardisation in MPEG

Spin-offs

- Tiledmedia BV

ITEA is a transnational and industry-driven R&D&I programme in the domain of software innovation. ITEA is a EUREKA Cluster programme, enabling a global and knowledgeable community of large industry, SMEs, start-ups, academia and customer organisations, to collaborate in funded projects that turn innovative ideas into new businesses, jobs, economic growth and benefits for society.

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Inmotio Object Tracking
Johan Cruijff Arena
Koninklijke KPN
TNO

Turkey

DIA Yazilim
Gerade Software
KoçSistem

Project start
October 2016

Project end
December 2019

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