Axis cameras as part of an interactive project popularizing science.

Intelligent video application demonstrates abilities of IP technologies in playful experiment called Náhoda (Chance).

Organization:
Žádná věda z.s.
(Experiment Nahoda)

Location:
Czech Republic

Industry segment:
Commercial

Application:
Broadcasting, analytics

Axis partners:
TINT, Netrex, Taktiq

Mission

Žádná věda, Czech Republic, has long been dedicated to the popularization of interesting scientific topics by utilizing public experiments and modern technologies. The task of this playful project was to examine the combination of mathematics, statistics and psychology, to see if pure willpower can effect certain events. A special device was created, an automatic dice thrower that required the use of an IP camera equipped with special applications for video analysis and streaming. Thanks to these cameras, the view of the inside of the dice thrower and the measurement results were available to the general public on the project website and for other promotional purposes.

Solution

Experts from TINT had to solve a task, which required creation of completely new automatic equipment. They proposed using an AXIS Q1775 Network Camera together with a software application specially created for this purpose, which allows the camera to read numbers on the dice and save them into statistics.

The project also used another AXIS Q1365 Network Camera equipped with the CamOverlay application, which joined the feeds from both cameras together in real time and streamed it as one single feed through the Internet.

Result

The Náhoda project, with its special dice throwing device and Axis cameras, took place over 3 weeks in November 2016 at several public places in Prague and Liberec. It also drew the attention and interest of the media and the general public. At the installation location itself, the interactive exhibit was tried by 1,300 people and thousands of additional people watched the experiment on live broadcasts. Therefore, this playfully introduced project was not only an interesting scientific project, but also an actual real life use of modern IP technologies. This device will also be used for public projects in the future.

AXIS COMMUNICATIONS

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Zdeněk Neustupa, TINT software engineer.

Can you mentally influence the numbers on the dice?

The main idea of this playful project was to examine a topic covering mathematics, statistics and psychology. Many people believe that events may be influenced by the sheer power of will, for example when playing dice. Therefore, the creators of the project together with scientists decided to carry out a public experiment and called on participants to try to mentally influence the dice with the intention to score as many sixes as possible. The dice were thrown by a machine in this experiment – after pressing a button the machine's pneumatic system threw the dice and read the result. This ensured that participants could only wish for a certain result but could not physically influence the dice. The machine was located in the National Technical Library in Prague for several days, and then at shopping malls in Prague and Liberec as part of an experimental kiosk which presented information on mathematics, science and technologies.

Two cameras and intelligent application in action

The installation of the Chance experiment has clearly demonstrated the fact that the abilities of IP cameras surpass the usual scope of use in the security field. AXIS Q1775 is the dominating feature of an almost 3 m tall machine, which automatically reads the results of the thrown dice. The camera utilises software created by TINT. The software is based on proven picture analysis methods – also used for vehicle license plate recognition. The process itself begins with an electronic impulse going to the input port of the camera. The current picture is then stored and later analyzed. First, a black-and-white picture with clearly defined pixels that are the focus of interest, and with pixels that are solely in the background, is created. Thanks to the application of a sophisticated method (extraction of blobs using Gaussian differentiation), the analysis is less prone to error caused by blurred input image and also eliminates issues caused by sudden changes in lighting or shadows in the image. Therefore, the application has fulfilled its purpose in terms of statistical measurements.

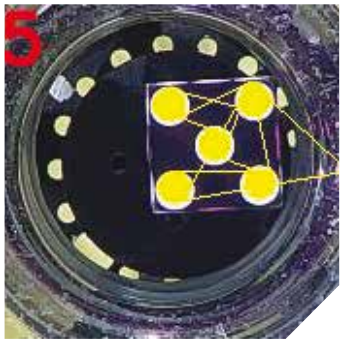
"Most likely the application that we have developed for this experimental project will not be used for any other commercial project"" says Zdeněk Neustupa, TINT software engineer. "But it is important in terms of educational purposes. The installation of the dice throwing machine clearly demonstrated the abilities of video analysis generally used with available IP cameras."

The other AXIS Q1365 camera also played an important role in the project because it recorded participants in the experiment for a live on-line show called Slow TV. Here, an additional application called CamOverlay, made by NetRex and specially designed for Axis cameras, also played an important role. This application is able to insert a picture directly inside the camera from another video source – in this case from the other camera installed in the machine. This enabled viewers to see the participant of the experiment and the result in one unified picture.

Entertainment and education

And what was the outcome of the experiment? No mental influence on the dice was proven. The experiment was directly participated in by 1,300 people on site, including numerous passers-by, who curiously examined the unusual structure of the machine and watched the feed from the integrated camera and the statistics on the monitor. Other viewers watched the experiment on the Slow TV broadcast. The total amount of throws (16,000 throws) did not determine that the desired number six scored more hits than any other number on the dice. However, a passionate debate between viewers focusing on mathematics, probabilities, statistical evidence and about the border between science and pseudo-science has certainly taken off.

Thanks to its potential, the experiment drew the attention of several educational institutions. Representatives of the Žádná věda organization are currently negotiating a several-month long installation of this machine with curators of a Moravian IQ park in order to provide further entertainment and education.



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