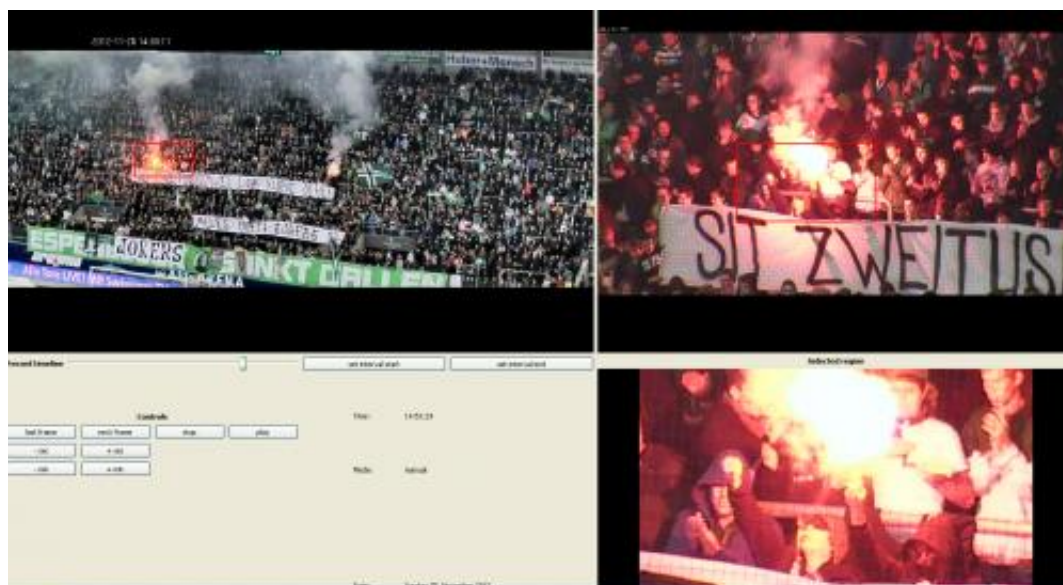


Targeted video surveillance in the soccer stadium

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Vigilant Eye System with one active dome camera: top left the overview image, top right the image from the active camera; bottom right digital zoom image of the section highlighted in the red box, which allows individuals to be identified. Credit: Fraunhofer FIT

At the end of 2012 the German Soccer League's paper on safety was adopted. It envisages, among other things, improving video surveillance in stadiums. The second-generation Vigilant Eye System can help achieve this aim. This enhanced product from Fraunhofer FIT uses synchronized fixed surveillance cameras and rapid zoom cameras which provide detailed images to clearly identify culprits. Specialized image

analysis algorithms allow the system to automatically detect the use of flares at an early stage and pick out other salient events. The system points out critical situations to surveillance personnel and automatically records high-resolution video footage that can be used in evidence.

Calls are growing for tighter video [surveillance](#) in German soccer stadiums. Following the adoption of the German Soccer League's paper on safety in December 2012, Hesse Interior Minister Boris Rhein is now calling for stadium bans to be imposed on those fans caught throwing flares and fireworks following crowd trouble during the second leg match between Leverkusen and Frankfurt. In an interview with the dpa press agency, he announced that stadium surveillance would be tightened. Many observers, however, doubt whether these measures will actually defuse the situation inside stadiums. Others hope that improved video surveillance technology will identify the actual culprits in the stadium so that blanket [punishments](#) imposed on clubs, such as the exclusion of supporters for certain matches or fines, can be avoided. The enhanced Vigilant Eye System from Fraunhofer FIT is a step in this direction. The system has been tested successfully in the AFG Arena in St. Gallen, Switzerland, under real-life conditions.

A basic system uses a fixed [surveillance camera](#), which covers a certain section of the stadium, and either one or two active dome cameras, which can very quickly pinpoint and zoom into scenes in the surveillance area. The Vigilant Eye System synchronizes the cameras with each other. If the operator chooses a certain spot in the overview image using the touchscreen, both cameras immediately lock onto this position. By properly positioning the zoom cameras, situations obscured from the front can also be recorded, such as where flags or crowds of people obscure the view. In other words, where the operator manually adjusts one active [camera](#), the other active camera moves accordingly to provide the best image.

The Vigilant Eye System specifically helps security personnel to investigate suspicious scenes by automatically identifying suspicious situations in the overview image in real time and drawing the operator's attention to these incidents. The system is far more capable than a human observer in this respect, who by their very nature can only scrutinize limited sections of the entire area and may quickly suffer the effects of fatigue.

The system is also specifically programmed to pick out flares and fireworks. All the image data from the active dome camera is recorded in high resolution at 12 frames per second. "The image resolution meets all the requirements for proof of identity and the preservation of video evidence. The achieved zoom levels are currently unrivaled on the market," says Dr. Martina Kolesnik, research scientist at Fraunhofer FIT. The exact position of the individual zoomed images in the overview image is also stored.

When using two dome cameras, the Vigilant Eye System provides the operator with four separate views of the events. The operator sees the image from the fixed surveillance camera in one screen window. Two other windows show the optically zoomed images from the dome cameras. A fourth window can be used to display manually chosen areas of any of the dome camera images using the maximum digital zoom resolution. This enables individuals to be identified and the footage to be used as video evidence. The operator can take specific action to view a scene from various angles using the digital zoom, toggling between the two active cameras in fractions of a second by touchscreen operation of the three windows from the fixed and dome cameras. He can also alter the position and zoom level of the active cameras in this way. Alternatively, the cameras can be controlled using a mouse.

Apart from use in stadiums, the Vigilant Eye System can also be used for security surveillance in buildings, entrance areas, streets, car parks, or

restricted areas. It automatically detects security-relevant scenes and stores high-resolution images of these scenes.

More information: www.fit.fraunhofer.de/

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