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IP-BASED VIDEO SURVEILLANCE

Originally video surveillance was done based on analog technology - closed circuit television (CCTV) and recording on video tapes. The picture quality wasn't great and it relied on human reliability. A digital camera "views" the scene in front of it, broadcasts the video images as a digitized signal over a LAN line (Local Area Network) where it's then transmitted to a computer or server. The server in turn manages all of this information. IP-based digital surveillance uses cameras that use signal processing that send packetized video streams over the LAN through a Cat 5 cable rather than a coax cable network, utilizing greater bandwidth and standard TCP/IP communication.

The advantages of IP-based video surveillance:

- Accumulation of the best features of analog cameras by IP cameras: high sensitivity, correct color rendering; low level of noises;
- High picture quality;
- High speed of access to video archive;
- Minimal costs on equipment assembling due to utilization of an existing computer network, while the location of IP cameras depends on the customer's preferences;
- Possibility of digital zooming in and scaling of any frame;
- Possibility of sending of alarm messages via e-mail or SMS;

IP-based video surveillance is a completely new technology in security television, but construction of this technology can be carried out on the basis of an existing infrastructure of local networks in a building/apartment. It can be provided in such places as shops, banks, airports, railway stations and underground, offices, transport. It is the future of video surveillance and it's provided all over the world including Ukraine. Yearly exhibition in autumn in Kiev called "Security" is an easy way to get to know more about IP video cameras and other surveillance equipment.

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3D IMAGING USING A TIME-OF-FLIGHT TECHNOLOGY

The use of digital imaging continues across all aspects of our commercial and personal lives. An important transition to use of 3D data sets is now underway.

By measuring the distance for each individual pixel of the image, time-of-flight (TOF) cameras enable the generation of true three-dimensional images in real-time. In such 3D images and 3D video sequences, objects are easily and reliably localized, making this technology very interesting for applications such as robotics, machine vision, automotive applications or gaming. Unlike a conventional video camera, the TOF camera delivers not only an intensity image but also a range map that contains a distance measurement at each pixel, obtained by measuring the time required by light to reach the object and return to the camera (time-of-flight principle).

It is very easy to extract the distance information out of the output signals of the TOF sensor, therefore this task uses only a small amount of processing power, again in contrast to stereo vision, where complex correlation algorithms have to be implemented. The camera can also operate under strong sunlight conditions. The pixel has the ability to substantially cancel the effect of ambient light at the expense of producing a slightly higher noise.

The camera contains a light source constructed from a bank of infrared LEDs (or laser diodes), a lens system for the detector chip, a detector chip with phase-sensitive pixels fabricated on standard CMOS process, and an embedded CPU for application processing.

In this paper, described the system design of time-of-flight 3D range camera and compared with 2D-camera equipped with ultrasonic or high-frequency distance meter.

TOF 3D camera has several advantages over similar technologies relating to cost and performance.

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GRID COMPUTING

Grid – the coordinated, open and standardised computer environment which provides the flexible, safe, coordinated division of computing resources and resources of storage of the information which are a part of this environment, within the limits of one virtual organisation.