

## Basler Low-Light ace U Camera Helps to Analyze the Flow of People and Vehicles in a Smart City

### Customer

- SoftServ International
- Location: Natick, Massachusetts, United States
- Industry: Wide Area Motion Imagery, Persistent Surveillance, ISR (Intelligence, surveillance and reconnaissance), and Video Analytics
- Implementation: 2019



*StareServer 1 is a server in a compact box (11 cm in length) with the Basler ace U camera acA4024-29um and a high-resolution lens.*

### Application

SoftServ International, stationed in the Boston area, develops Wide Area Sensing products. In those, a camera is mounted on a tethered aerostat or an unmanned aerial vehicle (drone). From there, it surveys a large area on the ground, several miles in diameter. The camera detects and tracks hundreds of moving people and vehicles, learns normal behavior patterns and alerts about unusual activity. It also records and archives the image data for later analysis.

These systems have been actively employed in the surveillance and security applications, e.g. in airports, harbors, at the border and along the coast lines. They are also used in law enforcement for prevention and investigation of acts of terrorism and other crimes.

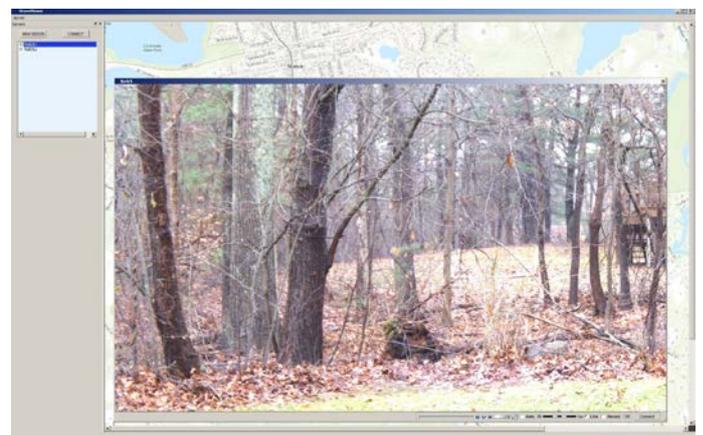
As the application area widens, these systems can be used in civil areas, like firefighting, search and rescue missions, natural disaster relief and endangered species protection.

Imran Khan, founder and chief technology officer of SoftServ, sees a big potential for these systems in smart city applications. In those, vehicles (cars, trains, airplanes) communicate with the infrastructure (V2X) and with other vehicles (V2V) and exchange information about road conditions, traffic flow, obstacles etc.

### Solution and Benefits

The newest addition to SoftServ's portfolio, the StareServer 1 is a server in a compact box (11 cm in length) or as a board with the Basler ace U camera acA4024-29um and a high-resolution lens. The system acquires image data at high resolution, performs video analytics in real time, streams multiple regions of interest, and stores 24 hours of data. Parallel to that, it allows rewinding and rewatching the acquired imagery.

The ace U with the STARVIS sensor IMX226 turned out to be the perfect match for this system. The back-illuminated sensor is extremely sensitive in low-light conditions. According to Khan, usually such applications employ infrared cameras which are much more expensive and thus unaffordable for civil applications. Also, the combination of the high resolution of 12.2 MP and small pixel size of 1.85  $\mu\text{m}$  allows the camera to stay compact. The camera and the server can fit in a small turret, pan-tilt-zoom (PTZ) housing or even on a drone.



*StareViewer 2019 is a Windows application that shows the live video stream from the employed cameras and zooms in on unusual behavior.*

The pylon SDK was a big decision factor as well. „I have worked with many cameras and various software development kits, and noticed the high and consistent quality of Basler’s engineering and software integration“, says Khan.

In surveillance applications like those in airports, the server with the machine vision camera will allow scaling. Usually human operators watch footage from 4-6 cameras simultaneously and are quickly overwhelmed by fatigue. In the application with the StareServer and Basler’s ace U camera, the screen will show a contextual map and analyze the imagery on the fly, zooming in on unusual patterns. That way, human operators can focus on things that matter.

Also, the ace will decrease the amount of data that needs to be transmitted. „An IP camera streams data in a fixed format and rate and consumes a lot of bandwidth. Say, you want to deploy 100 cameras, but the communication channel is already overwhelmed at 20-30 pieces“, says Khan. The ace U will allow scaling and deploying more cameras.

In a robotic or an autonomous vehicle application, the camera and the system will analyze the surroundings based on the imagery using depth perception and 3D analysis. Being connected to the network, the system can draw imagery from inside the camera and from other cameras or from previously saved data.

The new StareServer will be launched in January 2019. Khan expects the StareServer to be integrated into unmanned aerial vehicles, drones and PTZs, then into smart city applications and later into autonomous vehicles. At first, the StareServer will work with one camera and later there will be the second camera option. Khan also plans to integrate cameras with higher resolution when those models are released.



A network of StareServers with Basler cameras allows having an overview of the entire city and track vehicles and people at long range.

## Technologies Used

- Basler ace U camera acA4024-29um
- StareServer 1, Intel i7-7600 CPU, 16GB of DDR4 RAM, 512 GB SSD
- Theia ML410m lens, 4K resolution, IR corrected day/night lens
- StareViewer 2019 (Windows application)

## More Information

<http://www.softserv-intl.com>



Basler ace U camera acA4024-29um



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