# How to use video cameras in elderly care – without compromising privacy

**Modern video cameras have now reached a point where they can simplify elderly care while maintaining and even enhancing each patient’s privacy. At Vitalis this week, I will present a real-life case in which Tellu does exactly this.**

Digital video cameras have now become so good that hospitals and other caregivers can use them not only to stream images and footage, but also as a source of discovering and logging meaningful care events: the patient gets into or out of bed, is on the floor or visiting the toilet, enters or leaves the room, and so forth: All such events can be extracted from video images.

Note here that I am not talking about solutions that continuously capture and stream video to a server for analysis. This is not only an inefficient workflow, it is also totally unacceptable from a security and privacy point of view.

**Anonymized by default**

Edge computing provides a solution to this problem, since algorithms to process the images can now be deployed on the camera itself. This way, actual images are never exposed outside the camera, and only processed events are sent to the care platform.

Modern cameras have powerful image processing capabilities, and this enables them to be used for things such as smart motion detection in defined zones. They can also be used both for face recognition and anonymization of pictures. There is great potential in using these algorithms and capabilities in combination, so that they can «watch» environments and raise alarms if specific sequences of events occur.

One simple example is if a patient falls out of bed and lies motionless on the floor. Another, more elaborate case, is if a patient steps out of bed, goes to the bathroom and stays away for more than 10 minutes. Both of these are examples of a situation that an algorithm can pick up and bring to the attention of a human caregiver.

**Privacy**

The possibilities offered by this new generation of cameras is the topic of a presentation I will be giving this Thursday at Vitalis, Scandinavia’s largest eHealth event. I will share examples of how we at Tellu use these features in practice while ensuring a level of privacy and security.

The talk is based on our experience with deploying cameras in an elderly home for dementia patients, an installation that forms part of a research project funded by the Norwegian Research Council.

At this institution, the cameras were primarily installed to assist the personnel during the night: It lets them supervise patients without waking them up or risk disturbing them. Our solutions also alert the personnel when patients leave their beds or rooms during the night. The institution previously tested equipment such as floor or bed sensors for this, but dedicated found them impractical because

i) they needed to be physically placed on the floor or under the bed, wired and left undisturbed and

ii) both types of sensors missed events when patients walked next to them, and generated false positives when patients threw objects at them.

**Additional benefits**

Using a camera offers much more flexibility in terms of the tuning and type of events to monitor, and it is also a lot less physically intrusive in the patients’ rooms. Also, all processing is done the camera itself and images are not stored elsewhere. This makes for a solution which is highly respectful of the patients’ privacy, and more so than many other sensors.

Furthermore, when generating alarms, cameras make it easy to collect events for trend analysis that may be highly important in caring for patients: For example, if a patient suddenly doubles (or halves) the number of toilet visits, this is a known indicator of a change in his or her health.

The same camera used for supervising patients and for generating alarms can also detect and signal such changes in habits in order to alert the health personnel earlier than what current procedures would allow.

If this sounds interesting, I hope you will attend my presentation on Thursday at 15:30. If you’re not at Vitalis, but still would like more details, feel free to reach out – I’m always happy to discuss how we at Tellu can help!

**About Franck:**

Dr. Franck Fleurey is responsible for the IoT gateway product line and the development of remote patient monitoring tools for municipalities, institutions and hospitals at Tellu (Asker, Norway). Until 2017 Franck worked as a researcher at SINTEF (Oslo, Norway), contributing to software engineering for embedded systems, distributed systems and the Internet of Things. He has also worked with nature-inspired mechanisms for software resilience, and has played an active role in project acquisition and technical management of research projects. Franck has contributed to more than 75 peer-reviewed scientific publications in the field of Software Engineering over the past 15 years.