Improving the lives of the vulnerable with AI

By Markus Levy

Advances in AI technology are significantly improving the quality of care for those challenged with physical or mental disabilities, sensing danger on their behalf and generally making life easier to manage.

For example, if someone falls at home or in a care facility and there's no one around, will they make a sound? Maybe, but often it can be inaudible, remote, or perhaps they may be incapable of speech or articulation. An inadvertent fall can lead to damaged or fractured bones, extensive bruising, scrapes or cuts. Surprisingly and sadly, such falls can also trigger the onset of dementia.

But AI enabled and managed sensing and camera technology can not only raise an alarm for assistance if accidents happen (and they do), but also act as a preventative measure by identifying overlooked hazards.

AI can also enable more seniors, or those with disabilities, to continue to live in comfort and familiarity for longer, knowing that they are being visually monitored – with their consent and at times of their guardian's choosing – for safety and security.

In addition to the well-being of the individual, the prevention of falls and/or rapid intervention aids swift diagnosis, identifies appropriate treatment, and informs rehabilitation options.

AI-enabled cameras can detect falls and alert staff when they are elsewhere, to help keep residents, consenting to such surveillance, safe. Fall detection can be accomplished with a variety of models, depending on the required level of performance and accuracy. For example, one could deploy a YOLO model to detect standing versus fallen person. This could even be used in a nursing home setting with a room full of people.

A more accurate approach could be accomplished with an OpenPose model, capable of detecting specific poses – the application can determine if a person is standing or lying down or anything in between. For an even higher degree of accuracy, one can combine a CNN with a recurrent model like an RNN or LSTM model, to provide detection as well as motion analysis (i.e., detecting a person in the process of falling).

The Ara-1 Edge AI processor is equipped to handle any of these models or combination of models, and with sufficient frame rate and resolution for a high degree of accuracy. The Ara-1 processors can run in cameras with low-cost Wi-Fi or Ethernet PoE (Power over Ethernet), either of which can communicate with a secured server hub. The right camera system architecture to use can vary from one location to another depending on factors such as networking and bandwidth capabilities, but the flexibility of the technology makes it easy to support the right option for each case.

There is no price that can be placed on the ability to keep loved ones safe and secure as they make their way through the less stable periods of life or are recovering at any age from physical challenges that would otherwise make them vulnerable to unnoticed spills or tumbles.

AI changes all that and is set to change it even further. It goes the extra mile, so family and friends don't have to worry.

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