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CONFERENCE ABSTRACT

Care respite: taking care of the caregivers

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Introduction: With an ageing population, the issue of care provision is becoming increasingly critical. Since the aspiration of the majority of older people is to live safely and well at home, housing monitoring will be part of health & care integration in the next decades. As a consequence, a higher proportion of people will have to rely on family, friends or neighbours as their informal caregivers, providing that this group already count as around 80% of all caregivers in the EU). The varied and cumulative problems that this caregivers face include loss of personal opportunities and self-esteem, financial problems or physical and emotional problems. Several strategies need to be enforced to prevent the burnout and improve the quality of life of these informal caregivers, such as the possibility of providing them with useful and reliable monitoring tools that can help reduce the exhausting and continuous supervision activity they have to perform, reduce their stress, and increase their leisure time while improving the autonomy and wellness of the dependent people.

The technological solutions currently in use are invasive (wearable sensors) or require actions difficult to perform by the elder (call or press the button), in critical situations (e.g. falling or fainting situations, where the elder is not able to give any response). As an alternative to these solutions, this paper describes *"Care Respite", a novel non-invasive, real-time and privacy-preserving monitoring technology conceived for the first time as a real respite for those taking care of others* and describes the results of the case studies.

Short description: The Care Respite technology is composed of an ambient intelligent device (AID) and a remote receiver. The AID device includes a Microsoft Kinect multi-modal sensor and a computer unit. The sensor captures audio and depth maps from around 25 m2 (thanks to its infrared structured light technology) to be processed in a computer unit by an advanced generation of Computer Vision software. This software is able to recognize specific events like: leaving the environment, falling/fainting, high agitation, etc. Monitoring can be done in dark environments thanks to the infrared technology of the sensor, therefore the appearance of the person is not used at all. The alert is transmitted to a receiver, any smartphone with

Internet connection. With our smartphone application, different caregivers can share the monitoring task of a single person, and a single caregiver can monitor multiple dependent people at the same time.

Key findings: The innovative aspect of Care Respite relies on (i) the benefits of the incorporation and exploitation of novel computer vision technologies now available thanks to the use of low-cost depth cameras, and (ii) on the feedback provided by informal and professional caregivers during these last two years. No other monitoring system in the market addressed to the caregivers is comparable in terms of safety, relief, autonomy, satisfaction, intimacy and cost reduction. The system does not require a fixed installation point, therefore the monitoring camera can be placed anywhere inside a home or a retirement house.

Highlights: Low cost RGB-D cameras are completely changing the computer vision world, as they are being successfully used in several applications and research areas. Following this trend, the first users of Care Respite liked the idea of exploiting depth data (not the appearance) recorded at the older person's homes to send alarms and information to their caregivers, who are connected using smartphone. An additional feature that liked the first users of Care Respite is its personalization aspect: the remote smartphone application allows the professionals or family carers to choose which risky events to monitor. Another lesson learnt during implementation is that the remote visualization and communication via image and audio is an essential and supporting tool for fast responses in case of risk, while improving the autonomy and life quality of both the elderly and their caregivers.

Conclusion: This project aims at ensuring that all disabled or chronically ill people can get the help they need without overburdening their families. Improving carers' quality of life and preventing their burnout require new solutions that are affordable and user friendly for families and caregivers. In this context, Care Respite represents a technological solution for the automatic detection of events like falling down, not moving during a period of time, receiving an unexpected visit or being absent from a room. The intelligent software is able to send an alert to the mobile device of the caregivers allowing real time response.

Keywords: ageing at home; monitoring technology; privacy-preserving; real-time event detection; remote communication