

Sensors and Monitoring

J. ROUSSEAU, J. MEUNIER, A.S.T. ARNAUD, N. LAPIERRE. *An intelligent video monitoring system: from an idea to the home implementation to detect falls. Gerontechnology 2018;17(Suppl):117s; <https://doi.org/10.4017/gt.2018.17.s.113.00>*

Purpose Developing technologies to help older adults to Age-in-place is paramount to cope with falls among the ageing population. Cameras-based technologies are efficient for home monitoring and are promising to detect falls at home but few are studied at home with older adults¹. Thus, the aim of this study is to present the development process of an intelligent video monitoring system (IVS) from its idea to its implementation at home to detect falls of older adults. **Method** The study followed a development research method² and encompassed 6 phases: (1) Qualitative studies to explore potential users needs (older adults, informal and formal caregivers); (2) The technological development using the first phase results and a simulation design with a stunt actor performing falls (*Figure 1*); (3) A simulation study in an apartment-laboratory to select the equipment of a simplified video monitoring system and to adapt its setting; (4) A multiple-case study design (n=6 older women at risk of falls) to evaluate the feasibility of implementing a video monitoring system at home; (5) A simulation study using the complete IVS to adjust the technology and to elaborate the implementation procedure; (6) A multiple case study design to evaluate the implementation of the IVS (n=3 older adults at risk of fall). **Results & Discussion** (1) The perception of potential users of the IVS was positive (92% of older adults and 83,3% of informal caregivers). They had suggestions to facilitate the adoption and the use of the IVS³⁻⁵. (2) A method using a single camera was developed to detect falls and showed a specificity and a sensitivity between 95-100% in laboratory⁶. (3) The simulation in the apartment enabled to choose wide-angle programmable cameras and to build a procedure for its implementation at home. (4) The implementation of a video monitoring system at six older women's homes showed that they had an overall favourable opinion about the system; results supported the use of video monitoring systems at home if they respect privacy and life habits. (5) Previous phases enabled to enhance the IVS, which showed a sensitivity of 91% and a specificity of 99% in an apartment-laboratory. The two-months implementation of the IVS has been successfully tested in the apartment of a healthy young adult. (6) The two-months implementation at home (*Figure 1*) of three older adults with a risk of fall is underway and shows its feasibility and its acceptability. However, adapting the IVS to various environments remains a challenge.

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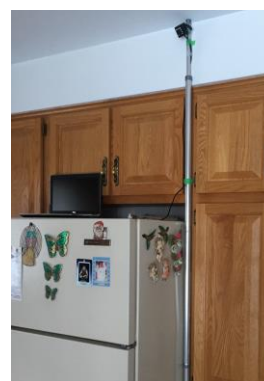


Figure 1. Installation of the IVS in the kitchen

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Address: Université de Montréal, School of Rehabilitation, Site Pavillon Parc, C.P.6128 Centre-ville, Montréal, Qc, H3C3J7, Canada;

E: Jacqueline.rousseau@umontreal.ca