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INPATIENT FALL PREDICTION AND PREVENTION

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Statement of the Problem: Inpatient falls are recognized to be among the most problematic adverse events reported in hospitals, frequently prolonging and complicating hospital stays. In the US, between 700,000 and one million patients fall in hospitals each year, leading to an average of 6 additional hospitalization days, where the cost of treatment for fall injuries amounts to $13000.

Observational studies: It shows that 60–70% of all falls in the hospital occur from the bed or bedside chair. The current state of art mentions sitters, bed rails, and fall risk assessment questionnaires, alongside a number of technological solutions. In spite of extensive research, current solutions are not cost efficient or scalable, with fall risk assessment protocols applied inconsistently. Philips addresses the state of art limitations with a technology providing remote supervision of multiple patients simultaneously. The system receives input concurrently from a camera and/or a biosensor, and assesses the fall risk of patients by detecting in real-time a number of risks factors known to precede and contribute to a bed fall incident: patient restlessness, hazardous posture and position in the bed space. Based on the assessed fall risk, the system issues a notification to a remote sitter about patients at risk, allowing timely preventative interventions. Results of a laboratory study on 112 tests indicate that the system triggers a notification of average 23 seconds in advance of patient bed exit/fall events. The PPV values of the risk factors detected are 0.975 (restlessness), 0.924 (hazardous posture), 0.826 (hazardous position). The system also detects bed falls and exit events (PPV = 1.0)

Conclusion & Significance: We have presented a technology for remote supervision of multiple patients in parallel, enabling effective, cost-efficient, scalable services for inpatient fall prediction and prevention.

Biography

Par Dunias has been working in research and development (R&D) research organizations for the past 25 years. Since his PhD study at the Eindhoven Technical University, Electrical Engineering, he is developing sensors and invents measuring technologies in processes and in the past ten years in medical applications. Up to 2007 he worked at Philips CFT, in the sensor group where he has been system architect in sensor systems especially continues monitoring of cardiovascular post-operative patients. He switched in 2007 to TNO an applied research organization, where he was leading a Medical Instrumentation Program based on an Open Innovation business model, performing fundamental research in optical technologies for real-time diagnosis of biological tissue and fluids based on spectral technologies. Finally, related to the present work as independent external developer, he has been involved a Bed Fall Prediction system at Philips Research in Eindhoven.

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