Smart carpets for care homes and hospital wards

Optical fibres laid under the carpet alert healthcare professionals to a wide range of information on a person’s condition and walking patterns

Developed by The University of Manchester, England

> Fully working prototype and technical document available
> Positive evaluation by clinical partners
> The University of Manchester now seeks a commercial partner to collaborate on product development
THE PROTOTYPE

- Plastic optical fibres, laid on the underlay of a carpet, can bend when anyone treads on it and map in real-time their walking patterns.
- Maps 2D images by using light propagating under the surface of the smart carpet.
- Compact electronics at the edges measures and relays sensor signals to a computer.
- These signals can then be analysed to show the image of the footprint and identify gradual changes in walking behaviour or a sudden incident such as a fall or trip.

DESIGN

- Dimensions: 1.00 x 2.00 m active area.
- Materials used: commercial carpet and underlay, fibre-optic sensing layer.
- Hardware / software:
  - Portable external equipment - 240V power supply, palm-size data acquisition blocks from National Instruments (NI), laptop running NI LabView.
  - Dedicated imaging software, integrating NI Labview.

TECHNOLOGY BENEFITS

- New sensor system strategy based on tomography, allowing lower cost, easier deployment, maintenance and management of the sensor system.
- Alerting health care professionals in advance of an adverse event such as a fall or the acute onset of illness enabling remedial action.
- The carpet can be retrofitted at low cost.
- Gather a wide range of information about a person’s condition; from biomechanical to chemical sensing of body fluids.

CURRENT STATUS

- Fully working prototype ready for demonstration. Further prototypes targeting specific applications are possible.
- Clinical partners have positively evaluated the technology for application in areas such as Falls assessment; Community care and Assisted Living.
- Technical design/engineering document available.

POTENTIAL APPLICATIONS

- Smart carpets in care homes or hospital wards.
- Physiotherapists analysis tool for monitoring a person’s gait.
- An early-warning system to detect the presence of chemical spillages or fire.

OPPORTUNITY

- The University seeks a commercial partner for product development collaboration.

CONTACT

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