

Apps for Information-age Shoe Fastening

A swipe of the smartphone display dispenses with the need to stoop and tie: PFI will successfully complete a research project in the area of wearable electronics on 31 March. The set goal was to develop a system for automatic opening and closing of shoes controlled by an application installed on a smartphone or smartwatch.

A self-closing shoe system permitting wearers to do up and undo their shoes remotely without having to touch them has been developed in a research project conducted by PFI. The working title of the project is “AutoShoe”. The shoe is controlled by an App installed on a smartwatch or a smartphone. The system, together with all App programming, was designed and developed at PFI.

The AutoShoe can be a real boon for people with restricted movement in overcoming everyday challenges such as undoing and doing up their shoes.

The shoe is closed by means of a cord system which is drawn tight by an electric motor. The motor is located either externally on the heel of the shoe or alternatively on the tongue. The shoe is opened by a spring made of carbon-fibre reinforced plastic.

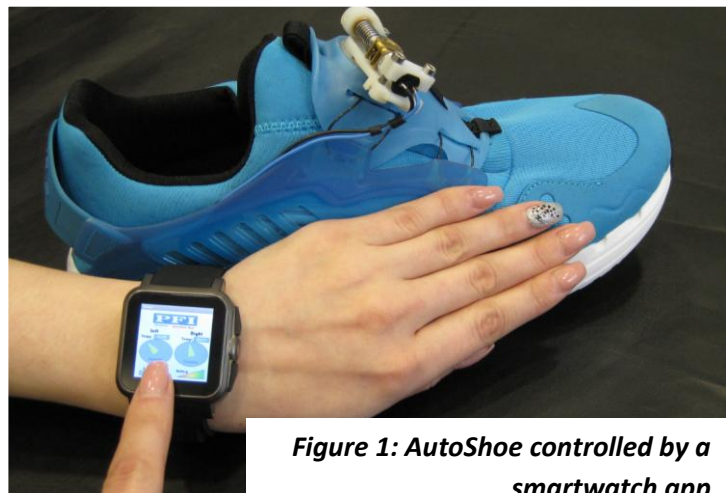


Figure 1: AutoShoe controlled by a smartwatch app

The possibilities offered by such a shoe will become all the more accessible if it can function without any need for maintenance. In addition to a rechargeable power source (a battery housed in the sole beneath the heel), the shoe also features energy-harvesting technology to recover energy from the motion of walking.

Functions in addition to mere lacing can also be implemented and visualised by the App. These include measurement and display of temperature and pressure.

Development of the AutoShoe and integration of novel energy-harvesting concepts have opened up new applications and enriched our understanding in the areas of “wearable electronics” and “smart clothes”.

The self-lacing, energy-self-sufficient shoe enhances the mobility and independence, as well as the safety, of older and physically restricted persons. In addition to this obvious advantage, it also has the potential to attract attention as a lifestyle product.



Figure 2: One of the first functional models

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Further information

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