

## **Re-Inventing the Wheelchair: a Collision-Avoidance System for a Focused Group of Disabled Users**

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### **EXECUTIVE SUMMARY**

Powered mobility has revolutionised the quality of life of many disabled people. Independent mobility is a central component of independent living and is associated with physical and mental well-being. However, some individuals are unable to benefit from powered mobility because, either the severity or the particular nature of their disability renders them unable to steer a chair safely around their environment.

Around the world, a number of groups have aimed to exploit technological developments to design a 'smart' or 'intelligent' wheelchair as a means of providing a safe form of mobility to those who are currently unable to take advantage. However, attempts have not targeted a sufficiently specific patient group leading to a lack of utility for the end-product and poor prospects of commercialisation. Additionally, where products have reached the market, costs have been prohibitive.

Building on my completed published clinical research characterizing the nature of navigational difficulties in a clearly defined population, I am now working with engineering colleagues to develop a chair which uses relatively inexpensive technology to provide a collision avoidance capacity to standard powered wheelchairs.

As well as providing a permanent solution for some users, the chair will also have features which allow it to be used as a training chair in rehabilitation.