

# Dynamic obstacle mapping for the visually impaired using sensor fusion.

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## 1. PROJECT CONTEXT AND OBJECTIVES

The Lighthouse team collaborated with Microsoft and the Guide Dog Associations to produce applications which can improve the living experience for the visually impaired users. Since few environments and applications were designed for the huge amount of blind and partly sighted individuals, the project aimed to relief the lack of available guide dogs in the UK and help the visually impaired participate in the society without relying on others the same way as the non-visually impaired.

Microsoft is both the sponsor and the client in this project. The particular field of study that the client wanted the team to explore was using wearable sensors which could be utilised by the visually impaired. Also, the client wanted low-cost, off-of-shelf hardware in this project. After analysing the requirements from the client, the Lighthouse team decided to find a way to improve the experience of visually impaired when entering an unfamiliar indoor environment. Finally, in this project, the magnetic sensor in the smartphone, the infrared sensor, the ultrasound sensor, camera were used with sensor fusion method, which is combining the data from all kinds of sensors and computing to get a better result than relying on the each type of sensor individually.

## 2. ACHIEVEMENTS

What software and other artifacts have you delivered?

## 3. EVALUATION

What evaluation have you done? What are the results of your evaluations?(Be specific; give numbers!)

## 4. IMPACT

What are the impacts of your work for your client and other stakeholders?

## 5. CHALLENGES

Was your project subject to significant constraints and difficulties (technical, organisational, logistics, etc.)? How did you respond to these constraints and difficulties?

## 6. LESSONS LEARNT

What can other software engineers learn from your experience in this project? (take away messages)