

## 2022 年英特尔杯大学生电子设计竞赛嵌入式系统专题邀请赛

### 参赛队作品简介

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作品题目	Lighting--视障用户购物辅助系统 Lighting---Shopping assistance for visually impaired users		
作品简介	<p>视力障碍人群由于身体条件限制，其活动范围往往受到极大的限制。而我国的残疾人公共配套设施，特别是视力障碍人群的设施不够完善，相关场所对视障人群的支持也不够到位。他们的活动往往限制在所熟悉的区域，而我们习以为常的行为对他们来说就是无法实现的复杂社会活动。为了帮助视力障碍特殊群体融入社会，逐步培养起对自己自立能力的信心，我们设计了这款视障用户购物辅助设备。本项目以超市为目标场景，以 GNS-V40 边缘计算主机为中心设备，提供服务支持，以树莓派为可穿戴分布设备的处理器。利用 IMU 和 UWB 室内定位结合数字孪生建模提供导航支持、以摄像头采集图像提供文字扫描和条码识别、以耳机和麦克风采集并输出语音提供智能的语音交互操作，实现无障碍购物的全程辅助，让视障人群也能享受到正常人群的购物体验。同时该项目也能为其他场景的应用提供示范效应，促进全社会对视障人群的关注，推动公共辅助设施的建设。</p> <p>Due to physical limitations, the range of activities of visually impaired people is often greatly restricted. However, the public supporting facilities for the disabled in my country, especially the facilities for visually impaired people, are not perfect, and the support for the visually impaired people in relevant places is not in place. Their activities are often restricted to familiar areas, and the behaviors we take for granted are complex social activities that are impossible for them. In order to help the visually impaired special groups integrate into the society and gradually cultivate their confidence in their self-reliance, we have designed this shopping aid for visually impaired users. This project takes the supermarket as the target scene, uses the GNS-V40 edge computing host as the central device to provide service support, and uses the Raspberry Pi as the processor of the wearable distribution device. Utilize IMU and UWB indoor positioning combined with digital twin modeling to provide navigation support, use camera to capture images to provide text scanning and barcode recognition, use headphones and microphones to capture and output voice to provide intelligent voice interaction, and achieve full assistance for barrier-free shopping. Visually impaired people can also enjoy the shopping experience of normal people. At the same time, the project can also provide a demonstration effect for the application of other scenarios, promote the attention of the whole society to the visually impaired, and promote the construction of public auxiliary facilities.</p>		