Assistive Robot for Blind and Low Vision Travelers

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According to the World Health Organization, in the world, there are more than 37 million blind people and about 125 million people who are low vision. If robotic technology could be used to enable blind and low vision people to travel in unfamiliar environments independently and safely, the quality of life would be improved for them. Unfortunately, existing robots have certain drawbacks. This project presents modern walking assistive robot for blind and visually-impaired people to navigate unfamiliar environments safely. The central idea is that choosing a legged platform for the robot because of it`s great offroad capability. 3D models of robot`s parts were designed in SolidWoks. To be sure that each part of the robot is sufficiently durable, we used the tool SolidWorks Simulation. Main controller of the robot based on dsPIC30 chip was designed for legged system control increasing robustness and reliability. Most of used control methods was verified by simulations and then experiments on a prototype. The gait for the robot is evaluated in numerical simulations. Also special software for system tuning was developed. This system was employed and tested by blind person in the Junior Edison TV show organized by the Shanghai Media Group, for which the author also developed a squat gait. This allowed for stable locomotion in slippery surface. The results suggest that the system can be used by visually impaired people safely.

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