Step to Signal: A Pressure-Activated Crosswalk System for Accessible Pedestrian Navigation

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Crosswalk systems use a button to alert cars that a person is waiting. However, this creates a problem for the physically disabled. My personal motivation for the project stems from my father who has ALS, which has caused mobility difficulties. The purpose of this project was to design a crosswalk system that uses a hand-free pressure sensor design rather than a button. The final design included a textured plate connected to four load sensors that use an HX711 amplifier to send data to an Arduino Microcontroller. When weight is detected, the load sensors send a signal that is stored in the microcontroller. The design was required to support 100kg to ensure it could handle a power chair rolling in it. Once the weight detected exceeds the threshold, the LED lights activate. These lights signal to cars that pedestrians are waiting to cross. Testing showed that the calibrated load sensors were able to accurately detect weight up to three decimal places, with 2 lbs (.9kg) showing up as 1.982 lbs (.86kg). This accuracy is important as weight increases, making sure there is no malfunction causing lights to be flickering when no one is waiting. The final design has improved stability, weight detection, and capacity. This device serves as an example of how simple designs can make life easier for people who already have it difficult.

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