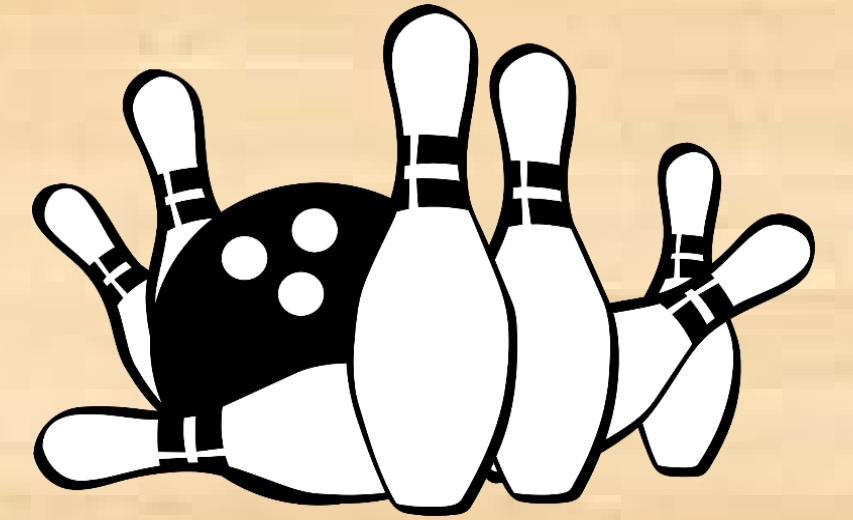


TEN-PIN BOWLING ASSISTIVE DEVICE FOR THE VISUALLY IMPAIRED

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Introduction

Visually impaired bowlers need some form of sighted assistance for feedback after each ball is rolled. This assistance is currently in the form of a sighted person relaying information about the remaining pins and where the ball impacted the pins. Our device aims to eliminate the need for sighted assistance to make the bowling experience more independent and enjoyable for the visually impaired.

Design Methodology

Design and construct a working model of the system



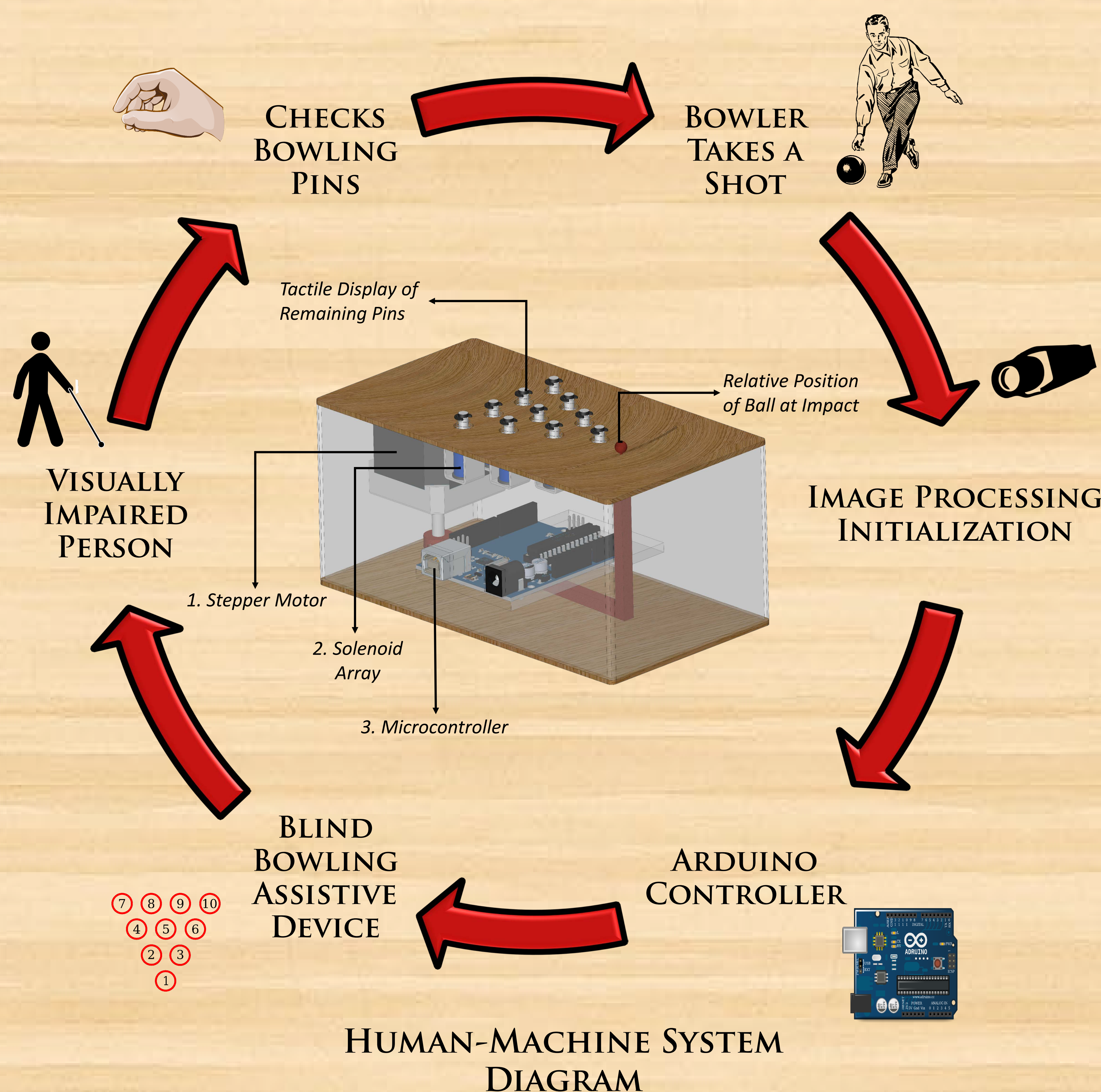
Capture real time data of the fallen and remaining bowling pins using a suitable camera



Process the image data utilizing MATLAB® linked to an Arduino microcontroller



Construct a tactile display to give effective feedback to the bowler



Device Operation

The bowling pins are each marked with black paint on their tops before being placed in the model to provide contrast for their detection through image processing. MATLAB® code is used to determine which pins have fallen and where the ball impacted the pin array. A microcontroller (3) then actuates a solenoid array (2) in the stationary device to provide the blind bowler with information about which pins have fallen and which remain. The microcontroller also actuates a stepper motor (1) mechanism to identify where the ball has impacted the pin array.

Results

Our device provides blind bowlers with a tactile display that conveys the positions of any remaining pins after each trial of bowling and the position where the ball hits the pin array.

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