North South University

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

PROJECT PROPOSAL

Smart Blind Stick Using Ultrasonic Sensor and Arduino Nano

Course Information
Operating Systems Design
CSE323 (Section 5)
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Submitted by

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1. Objectives

- Develop a portable smart blind stick for visually impaired individuals.
- Detect obstacles using an ultrasonic sensor.
- Provide audio and visual feedback upon detection.
- Utilize an Arduino Nano for compact, energy-efficient control.
- Enhance user mobility and safety.

2. Required Components

Serial No.	Component Name	Unit	Cost (BDT)
1	Arduino Nano	1	450
2	HC-SR04 Ultrasonic Sensor	1	130
3	Buzzer	1	30
4	LED	1	10
5	Battery 9V	1	100
6	Resistors & Jumper Wires	As required	100
7	Breadboard	1	150
8	Voltage Regulator (e.g. LM7805)	1	80
		Total	**1050**

3. Software and Hardware Details

3.1. Software Details

- **Arduino IDE**: The Environment for coding, compiling, and uploading the program.
- **Programming Language**: C/C++ for sensor control and feedback logic.
- **Operating System Design**: A simple control loop simulating basic OS functions.

3.2. Hardware Details

- **Arduino Nano**: A small & low-power microcontroller that will be embedded in the stick.
- **HC-SR04 Ultrasonic Sensor**: Mounted on the stick to detect obstacles ahead, sending distance data to the Arduino.
- **Buzzer**: Provides audio feedback when an obstacle is detected.
- **LED**: Lights up to provide visual feedback when an obstacle is detected.
- **Battery**: A portable power source that powers the entire system.
- **Power Management Circuit**: Ensures the system operates efficiently, providing power to the Arduino and sensor while maintaining long battery life.

The system will be mounted on a stick, with the ultrasonic sensor positioned to detect obstacles ahead of the user. When an obstacle is detected, the system will alert the user with both a buzzer (audio feedback) and an LED (visual feedback). The Arduino Nano's small size ensures portability, and its low power consumption will allow the system to run for extended periods on a single charge.