**Wire Buzz Game**

**Understanding:** Wire buzz game using arduino is played with a wire hook and a long thin wire with different shapes. We have to pass the wire hook from one end to another end of the wire without making contact between them. When they get in contact there is a sound called buzz. The goal of this game is to make the least number of contacts. Till now its purpose is to enjoy[1], eye-hand coordination[2][3] and control skill[3] but we will track the number of errors and time taken to complete the game. Then our project will show the **concentration level** of the performer.

**Model/Methods:**

* Arduino Uno
* USB Type A to mini B cable (for Arduino Uno)
* Solderless Breadboard - Mini and Full-size
* LEDs (x2) - Green and Red
* Resistors (x2) - 220 Ω
* Active Buzzer module (KY-012)
* LCD display module with I2C interface(x1) - 16x2
* Male-to-Male Jumper wires (x4) - 10cm
* Female-to-Male Jumper wires (x5) - 20 cm
* Jumpers (x5) - to reduce the usage of wires
* Copper wire
* Tape (or any form of insulation)
* Button/Switch(x1)
* Potentiometer(x1) - 10k

**Steps:**

* When we press the button the game will start. Actually the stopwatch[8] will start to count the time and display on the LCD display at the same time.
* Then when the wire gets hit the counter circuit will increase the number of hits by one. [9] It’ll also be shown in the LCD display.
* When the player touches the sensor at the end of the wire the stopwatch and counter will stop. After that our program will calculate the concentration level/marking with the algorithm we provided.

**Performance Metrics:** number of errors, time taken and concentration level.

**Accuracy:**

**Dataset:**

**Future Direction:** In future we’ll try to develop the game with difficulty level, more accurate concentration calculation, more dataset, more psychological metrics, size of the game etc. We’ll be able to use the game for ADHD[4] (Attention deficit hyperactivity disorder) patients to recover from hyperactivity. Also this game is used for binocular visuality experiments[5]. We can more accurately determine the result of these experiments with our developed project. Most importantly we will use robotic arms[6] to play this game and find the accuracy of the robotic arm. And that’s how we can also develop Dynamic Camera Usage in Mobile Teleoperation system[7].

[1] <https://en.wikipedia.org/wiki/Wire_loop_game>

[2] <https://en.wikipedia.org/wiki/Eye%E2%80%93hand_coordination>

[3] <https://www.termedia.pl/Development-and-application-of-an-electrical-buzz-wire-to-evaluate-eye-hand-coordination-and-object-control-skill-in-children-a-feasibility-study,129,45132,0,1.html>

[4] <https://www.atlantis-press.com/proceedings/icsie-18/55917597>

[5] <https://journals.sagepub.com/doi/pdf/10.1068/i0565>

[6] <https://pure.tue.nl/ws/portalfiles/portal/170467555/0968849_Dorussen.pdf>

[7] <https://dkanou.github.io/publ/P41__Peers__2022__UKRAS22.pdf>

[8] <https://youtu.be/kVBe3pCWCHA>

[9] <https://youtu.be/pj7eaxIauNI>