RYUJI KOW

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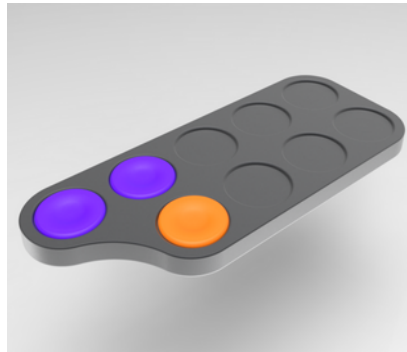ryujikjs@gmail.com

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OIO - INNOVATIVE INSTRUMENT

DIGITAL PROTOTYPES

What?

- To explore innovative methods of playing instruments.
- OIO is a unique musical instrument that utilizes physical discs containing music layers, allowing for the mixing of various tracks.

How?

- Participated in iterative cycles of ideation and design refinement.
- Produced 3D-printed prototypes for both the tags and the device.
- Created a working prototype by integrating PN532 RFID reader, NTAG 213 tags, micro switches and Raspberry Pi 3B+

Results

- A command-line application that streamlines the process of managing computer builds while verifying the compatibility of selected components.
- A simple interface that enables easy customization and organization of PC builds, ensuring optimal performance and budget adherence

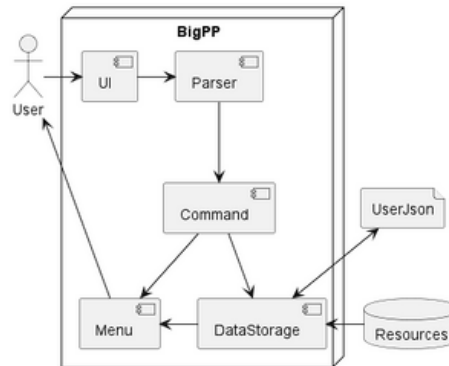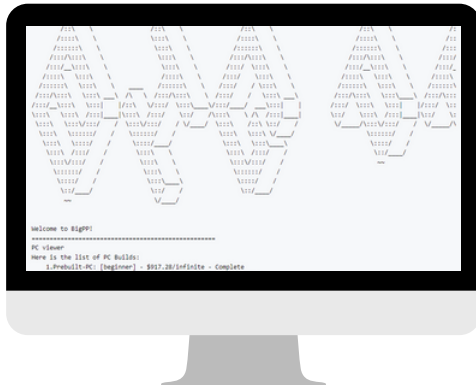### PHYSICAL PROTOTYPES

3D printed mock up of actual design

Working Prototype - proof of concept

- RFID and button concept. Pushing the top surface allows switch to be actuated while allowing the PN532 to read RFID tags

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BIG PC-PARTPICKER

What?

- a command-line application crafted with passion for PC enthusiasts and dedicated builders.
- Our goal is to empower users with a seamless and personalized PC building experience.

How?

- Create a high-level architectural design for the app.
- Utilize modularity and abstraction techniques when writing code
- Ample Junit and invalid input testing.

Results

- A command-line application that streamlines the process of managing computer builds while verifying the compatibility of selected components.
- A simple interface that enables easy customization and organization of PC builds, ensuring optimal performance and budget adherence

FPGA PROJECT
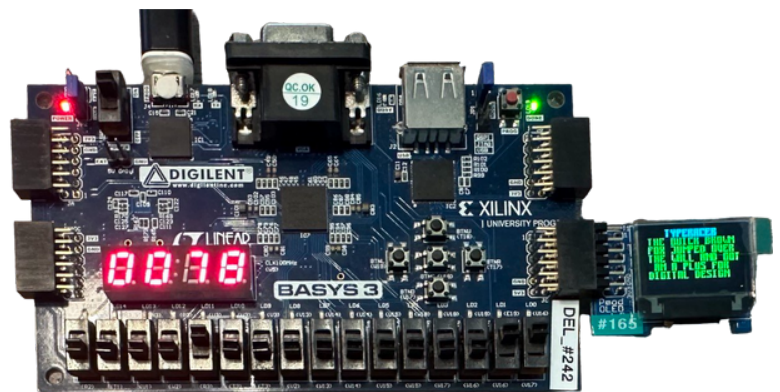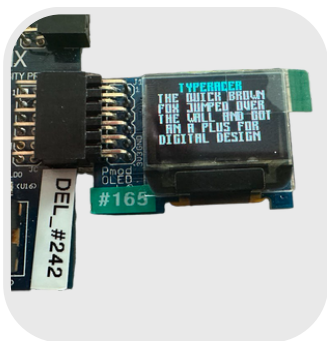
What?

- Create a Typeracer game that leverages both the keyboard input and pmodLED functionality on the Basys 3 development board.
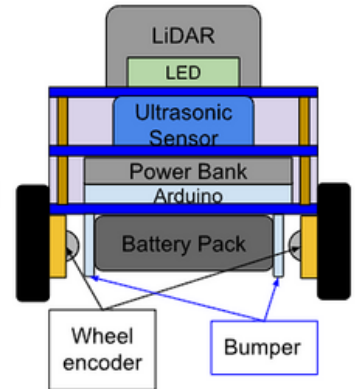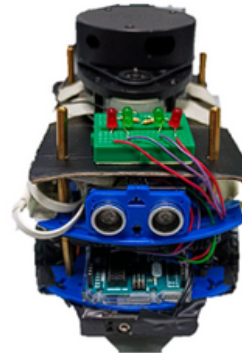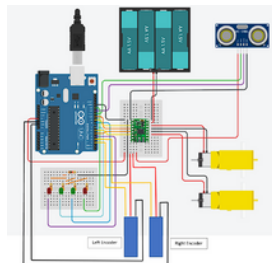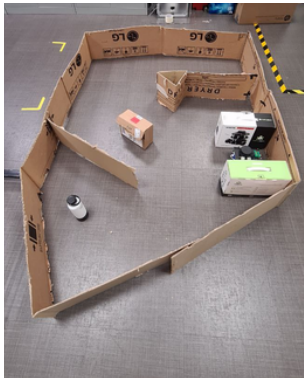
How?

- Created a high-level architectural system design.
- Used a grid matrix approach, populating it with corresponding letters
- .crosschecks keyboard input, dynamically assigning colors to letters based on their accuracy.

Results

- Implemented Typeracer game ,measuring and displaying WPM on a seven-segment display.
- Delivered an interactive and engaging typing experience with precise performance measurement.

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ALEX - REMOTE NAVIGATION ROBOT

What?

- Develop an autonomous search and mapping robot integrated with LiDAR navigation technology, designed to thoroughly explore and map uncharted areas.

How?

- Utilized ROS and Hector SLAM for visualizing the LiDAR-mapped area.
- Implement secure communication using Transport Layer Security (TLS) protocol, ensuring data confidentiality and integrity during their interactions.
- Established an SSH connection from a remote laptop to the robot.

Results

- Achieved the distinction of being the second fastest robot to successfully navigate and map an unknown maze area.
- Provided exceptionally clear and precise imaging of the mapped area, enabling easy determination of area size and accurate dimensions of walls and obstacles.

MBOT
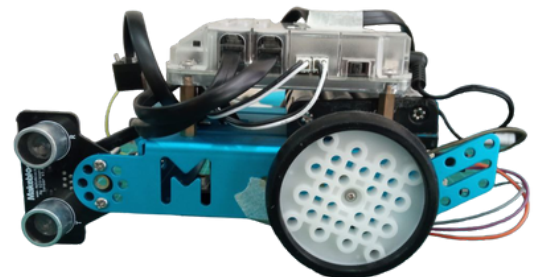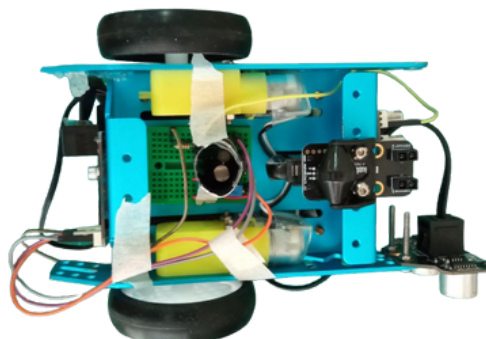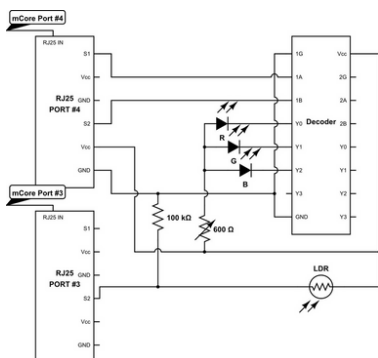
What?

- To build and developed mBot for final challenge : navigate through a maze by detecting the colours on the floor at each junction.
- Navigate the maze without touching the walls

How?

- Developed and tested colour senor using LED and LDR light sensor
- Wrote algorithm in C++ to allow robot to navigate maze

Results

- A robot capable of navigating the set maze and reaching the end point in less than two minutes and without touching the walls.