

ClockAide



Anita Ganesan (EE), Eric Moore (EE), Sachin Honnudike (CSE/EE + Webmaster), Joel Jean-Claude (CSE + Team Manager)
Adviser: Prof. T. B. Soules

Introduction

- Students with special needs require toys that can assist with learning
- About 1/3 of students in the West Springfield school district have special needs including:
 - Auditory
 - Motor Skills
 - Autism

The Client

- Megan Ferrari
- Special education teacher, West Springfield Middle School



The Client

Student Profile

- 6th to 8th grade students
- Functioning level – 2nd grade

Needs

- Require a lot of repetition to internalize lesson
- Extra adult support
- Auditory feedback

Problem Statement

Telling Time

- Ms. Ferrari students cannot look up at a wall clock to read the time
- Constantly ask the teacher to read the time for them

Lunch Numbers

- Students get nervous to dial Student Identification Numbers for lunch
- Overwhelmed by crowds
- Need a way to practice without stress

Proposed Solution

Trainer Clock with Keypad

Normal Mode

- Displays current time
- Will speak current time when button is pressed

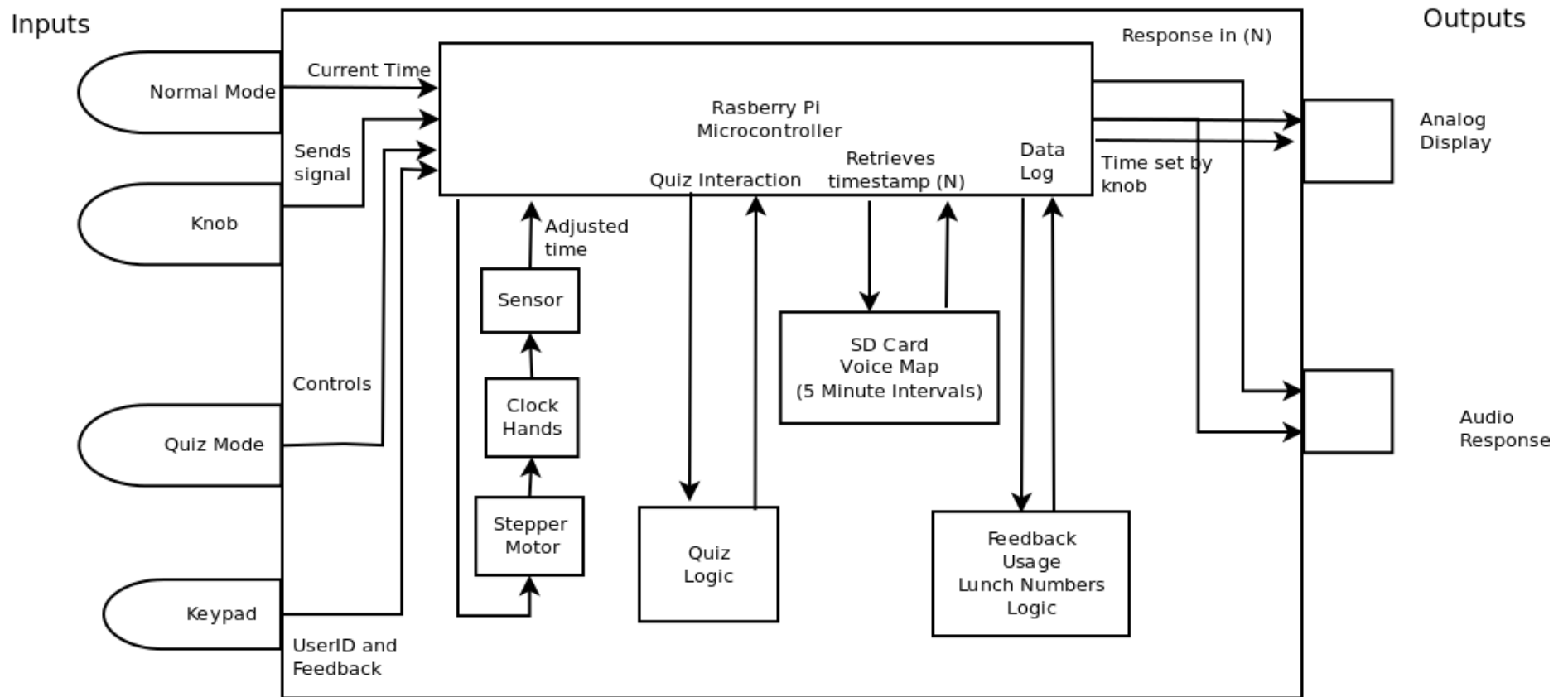
Quiz Mode

- Will interact with child by asking him/her to set the clock to a specified time
- Provide feedback depending on how the child responds

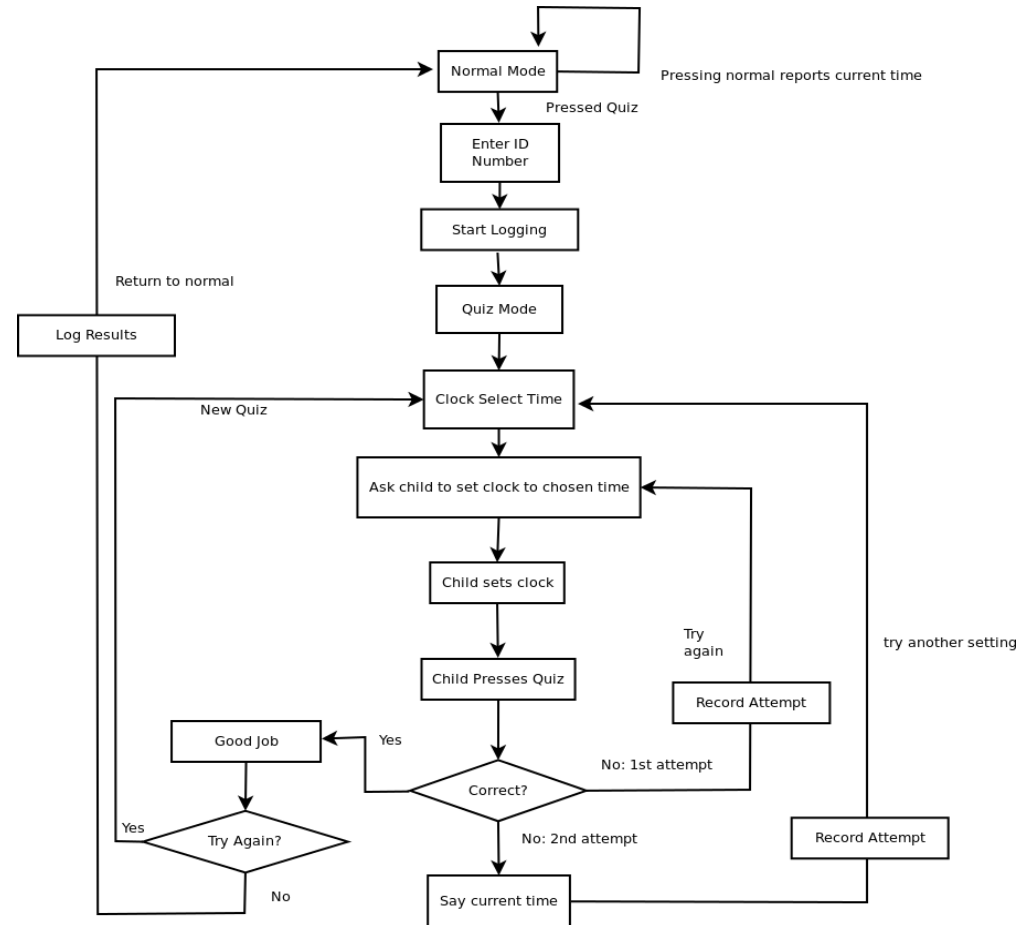
Keypad

- Students enter ID numbers
- Numbers are used to differentiate students in data log

Block Diagram



Workflow



Competition

Below: Onearoo Clock



Above: The Momo Clock

Priced between \$25 to \$50

Innovation

Feedback

- Keeps track of progress
 - Can be viewed by teachers
 - Can be sent to parents
 - Increases the value of the toy
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- Open Source
 - All code (including our website) and design files available on GitHub:
<https://github.com/SDP13-Team10>

Requirement Specifications

Dimensions (LWH)

- Trainer Clock
18 in. x 12 in. x 12 in.
- (Detachable) Keypad



- Minimize number of buttons for simple operation
- Robust and sturdy
- Easy to maintain

MDR Deliverables

- Trainer Clock with Keypad
 - Characterization of Stepper Motor
 - Record voices for time playback (in M5 Recording Studio)
 - Familiarization with microcontroller and keypad

Rough Budget

Trainer Clock with Keypad

- Raspberry Pi - \$35
- Buttons, Knob, Casing, Peripherals - \$100
- SD Card (2G) - \$15
- Stepper Motor - \$75
- MISC - \$25
- Keypad - \$50

Total = \$300

Questions?

Thank you!

References:

Massachusetts Department of Elementary and
Secondary Schools

Megan Ferrari Slideshow Presentation (Sept 20th)