

RePlay for Kids Toy Switch Controller

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Fig 1: Child with adapted toy.

Motivation

Enhance accessibility of toys for children with disabilities.

Problem

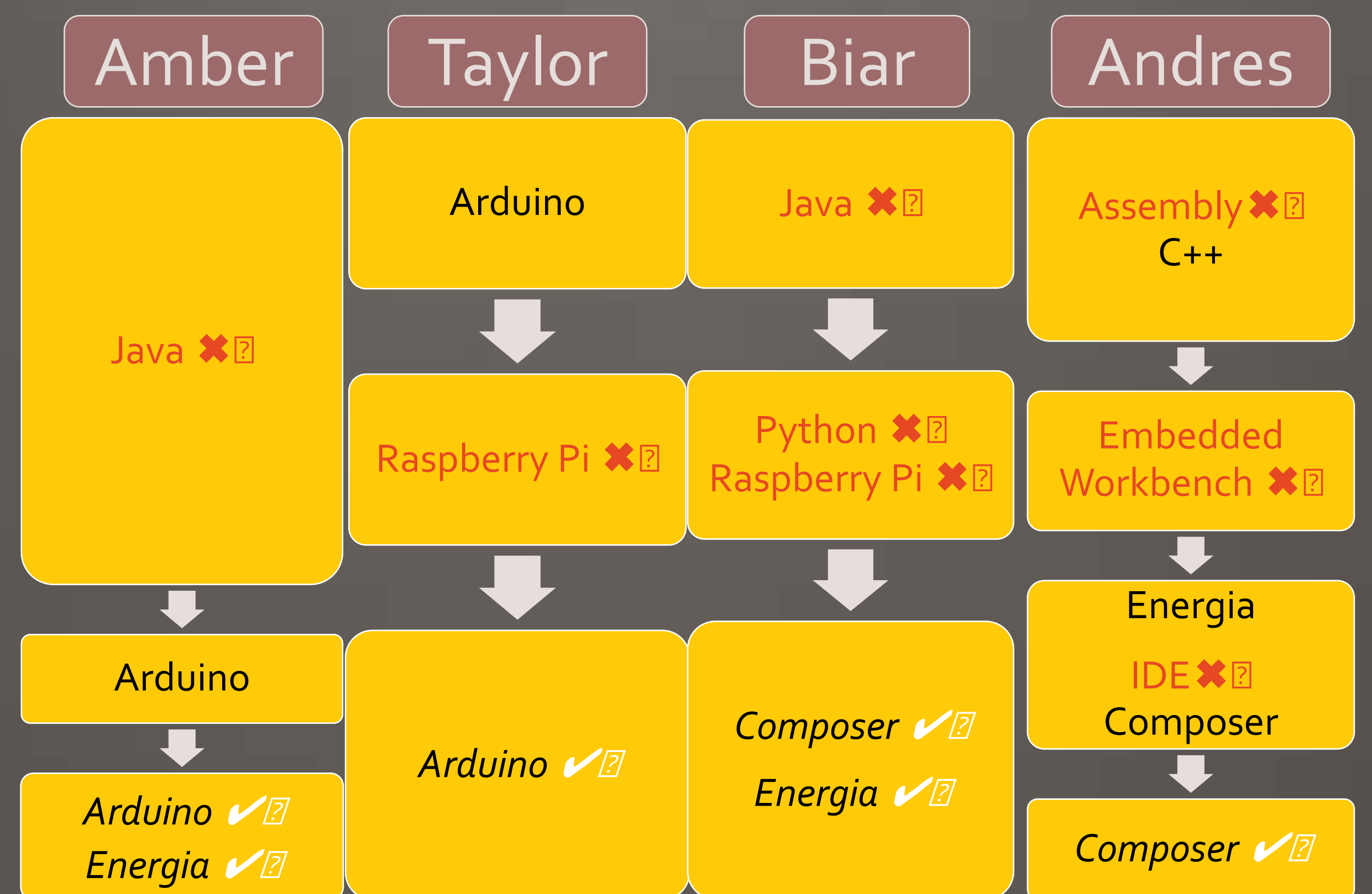
- ◆ Battery-powered toys are connected to a push button
- ◆ Toys with multiple outputs need more complex modifications

Goals and Constraints

- ◆ Write a program to sequence multiple functions using one push button
- ◆ Code:
 - Functional for 2-8 outputs
 - Easily manipulated to work with electrically different toys
- ◆ User friendly process for non-technical volunteers
- ◆ Free, Windows compatible software

Previous Attempt

OSU engineering students created a Java program that ran, but was not adaptable



Arduino Solution

1. Determine if switches are +/-.
2. Edit number of outputs and +/-.
3. Verify code and connections.

Energia

Use Arduino sketch on MSP430

TI MSP430 Solution

1. Edit number of outputs.
2. Determine if switches are +/-.
3. Verify code and connections.
4. Solder microcontroller to toy.

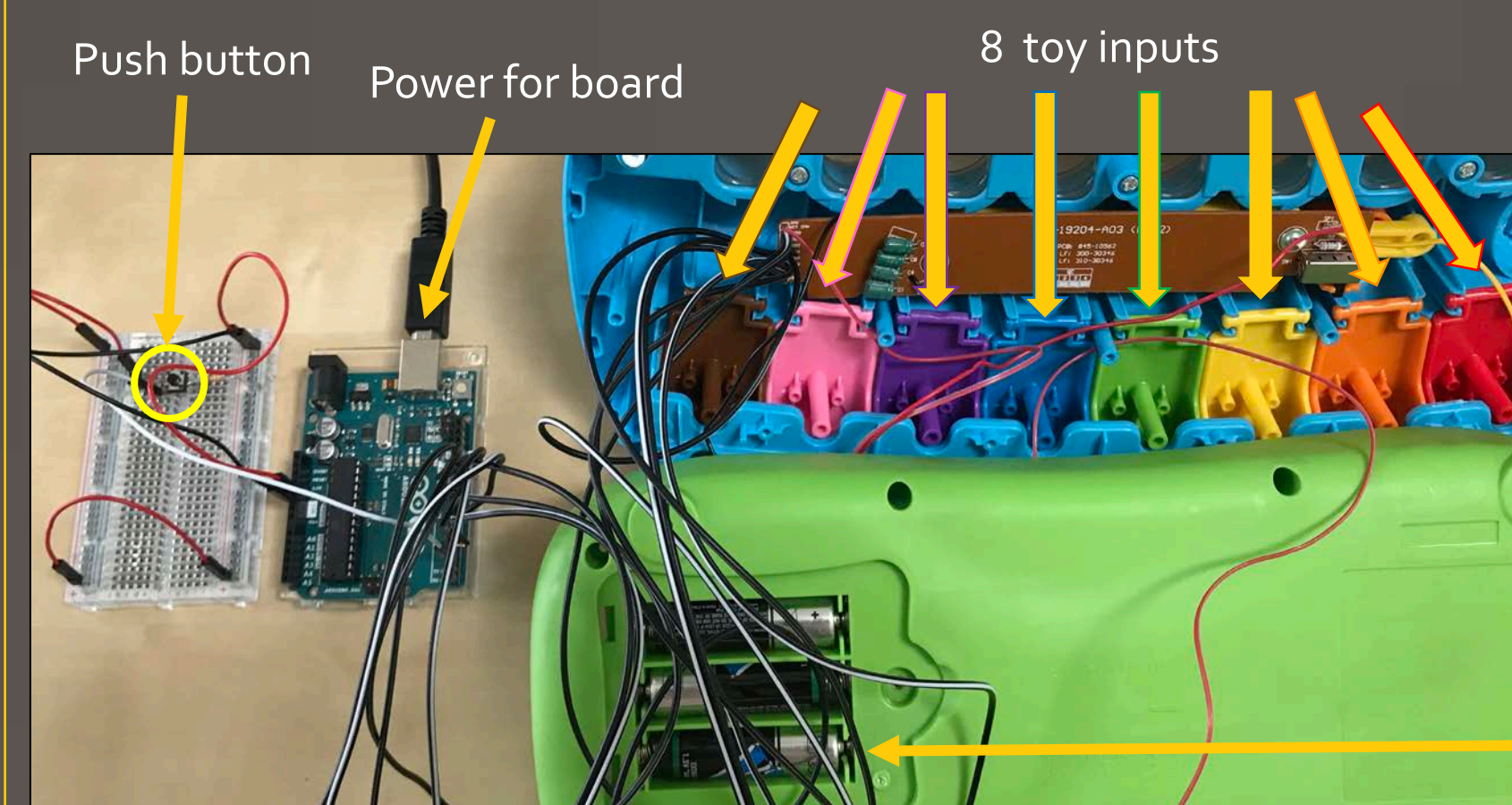


Fig 4: A battery-powered toy modified with an Arduino Board and a push button.

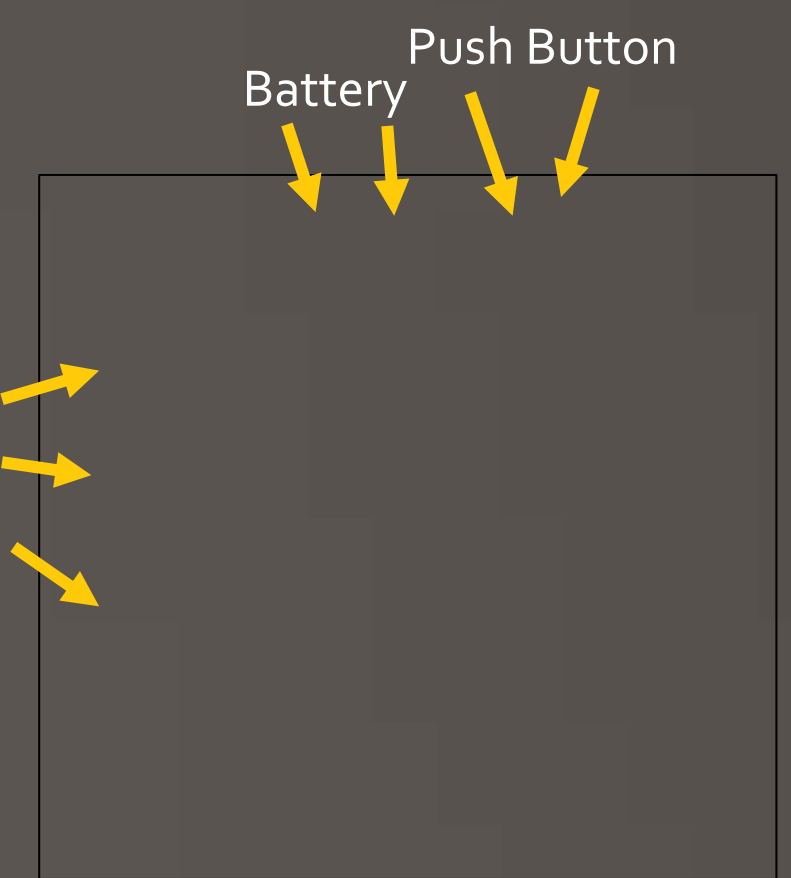


Fig 6: MSP430 Microcontroller

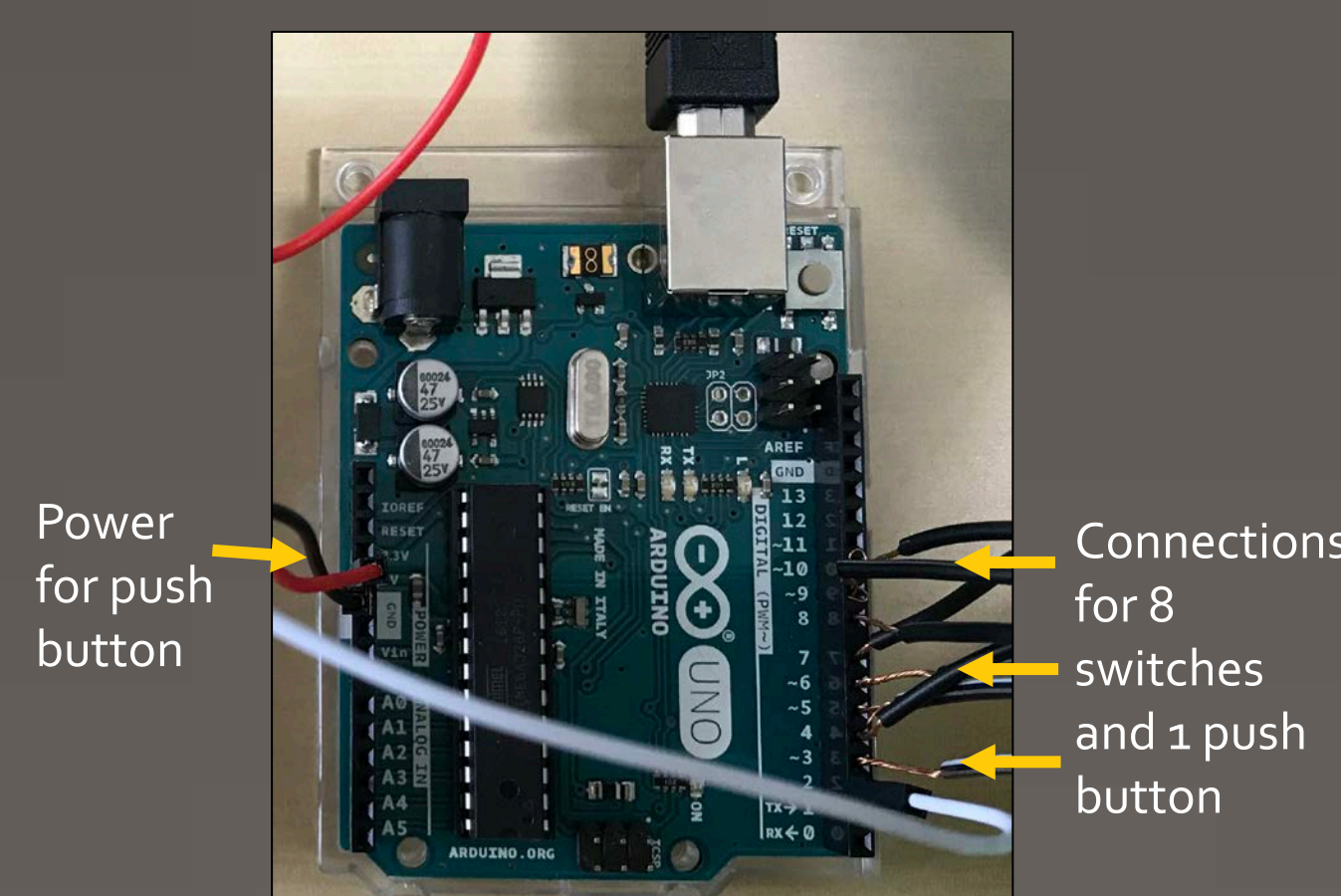


Fig 5: Arduino Board

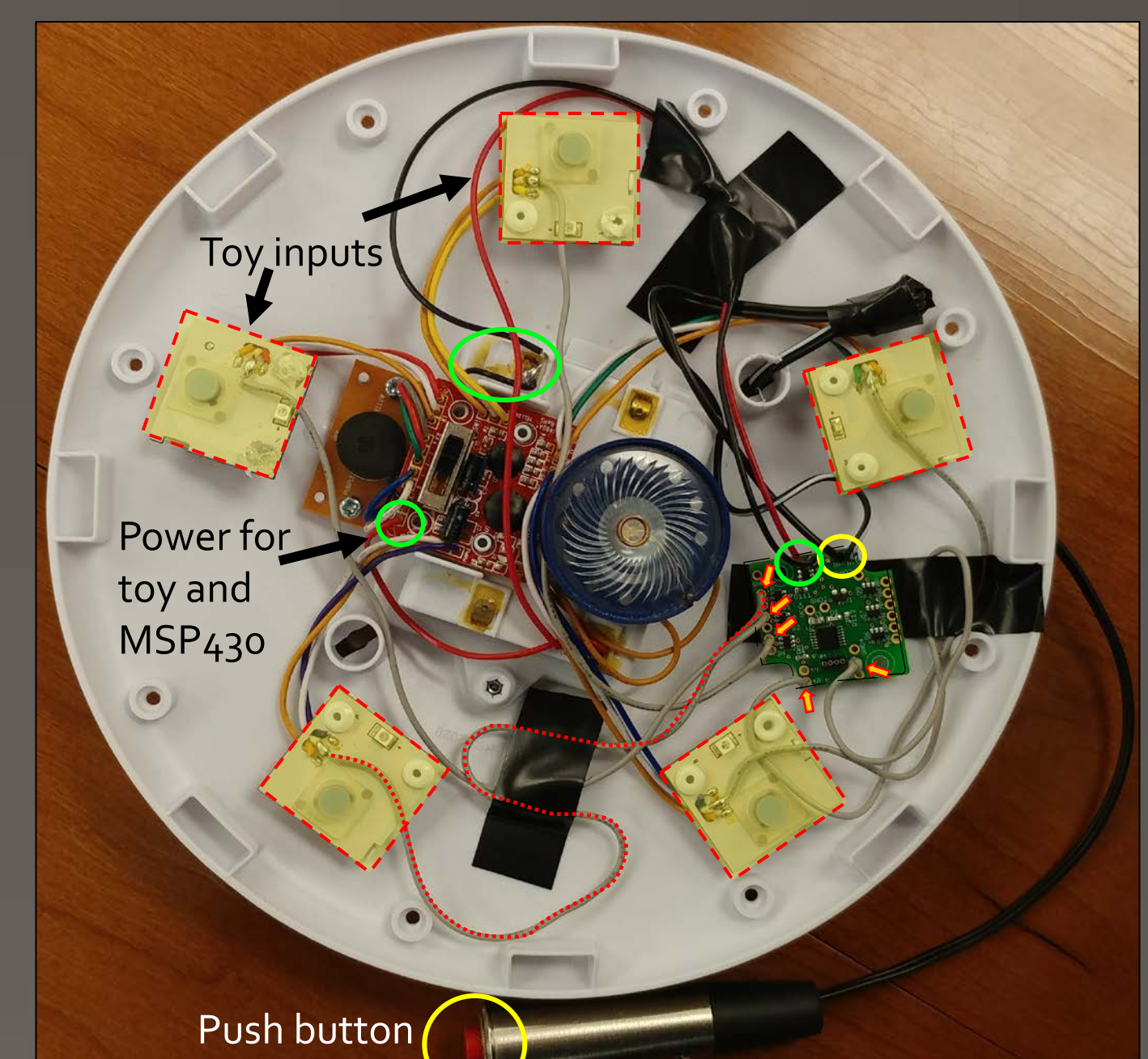


Fig 7: A battery-powered toy modified with a MSP430 Microcontroller and a push button.

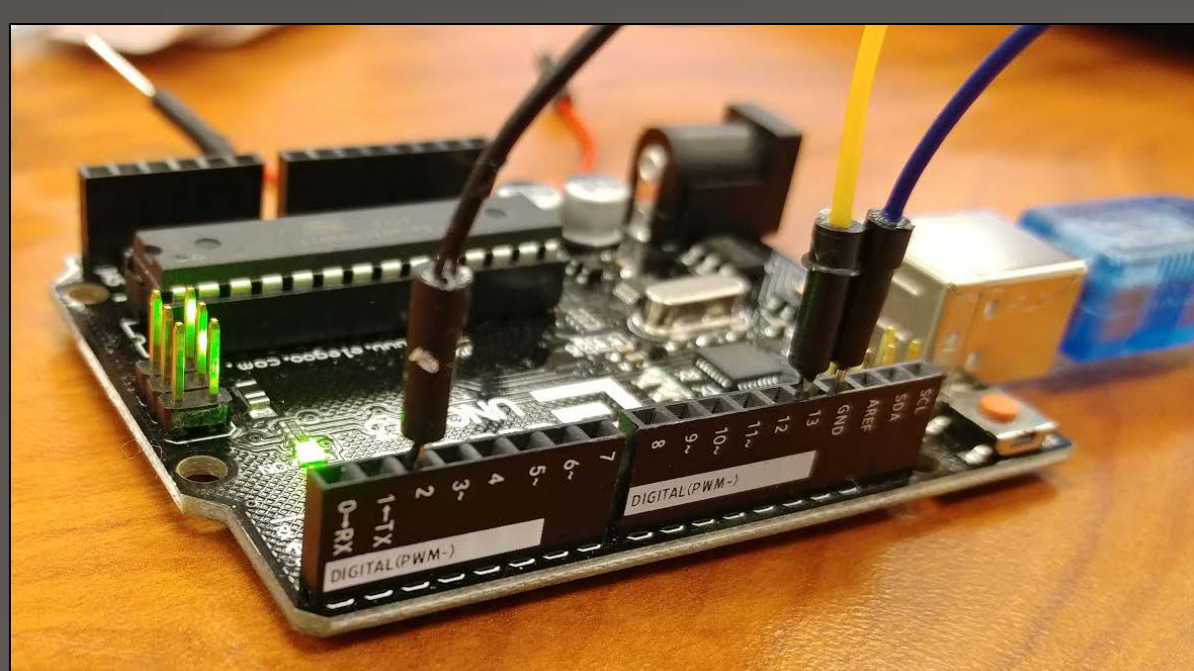


Fig 2: Arduino board.



Fig 3: MSP430 Microcontroller connected to a USB Debugging Interface.

Results

- ◆ Deliverables
 - Arduino/Composer Codes
 - MS Word Macro for editing code
 - Detailed documentation
- ◆ Future Work
 - Make code compatible with more kinds of toys
 - Create detailed questionnaire