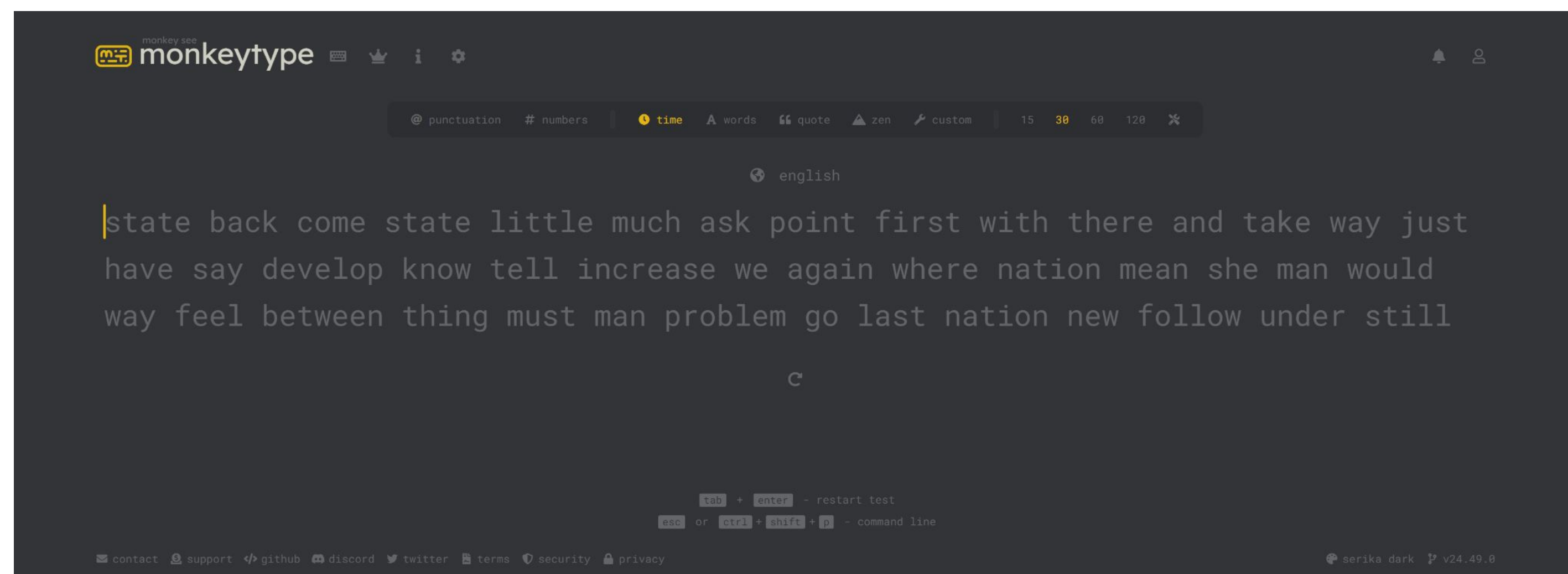


Interactive Typing Trainer

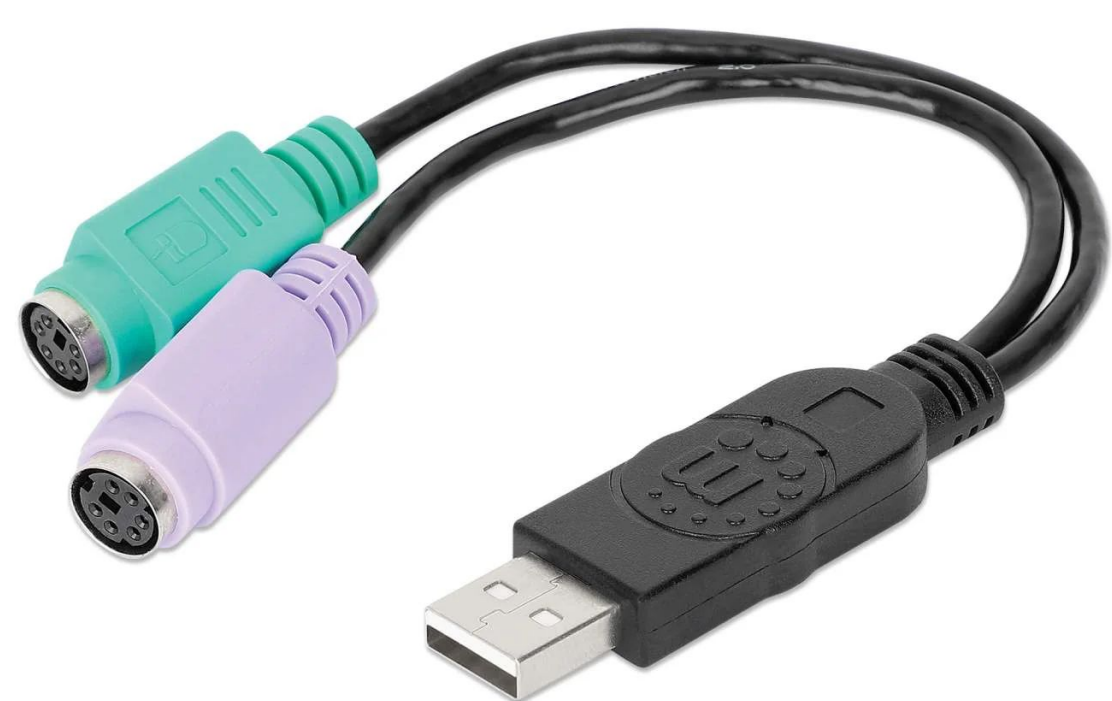
Alex Roznowski, Dora Kuflu, Gabriel Gottlob
{alexroz, dkuflu, ggottlob}@umich.edu

Motivation:

- We wanted to create an interactive typing game based on the online website monkeytype.com.
- The system is designed to assess the typing speed of the user based on words per minute (WPM) typed.
- The system can be used offline, in conjunction with the display, or as a headless interface.



Design Considerations:



Keyboard: PS/2 was chosen over USB because of its specialized function and simpler interface.
Display: VGA was chosen over HDMI due to smaller overhead and simpler display driver.



System Overview:

STM32:

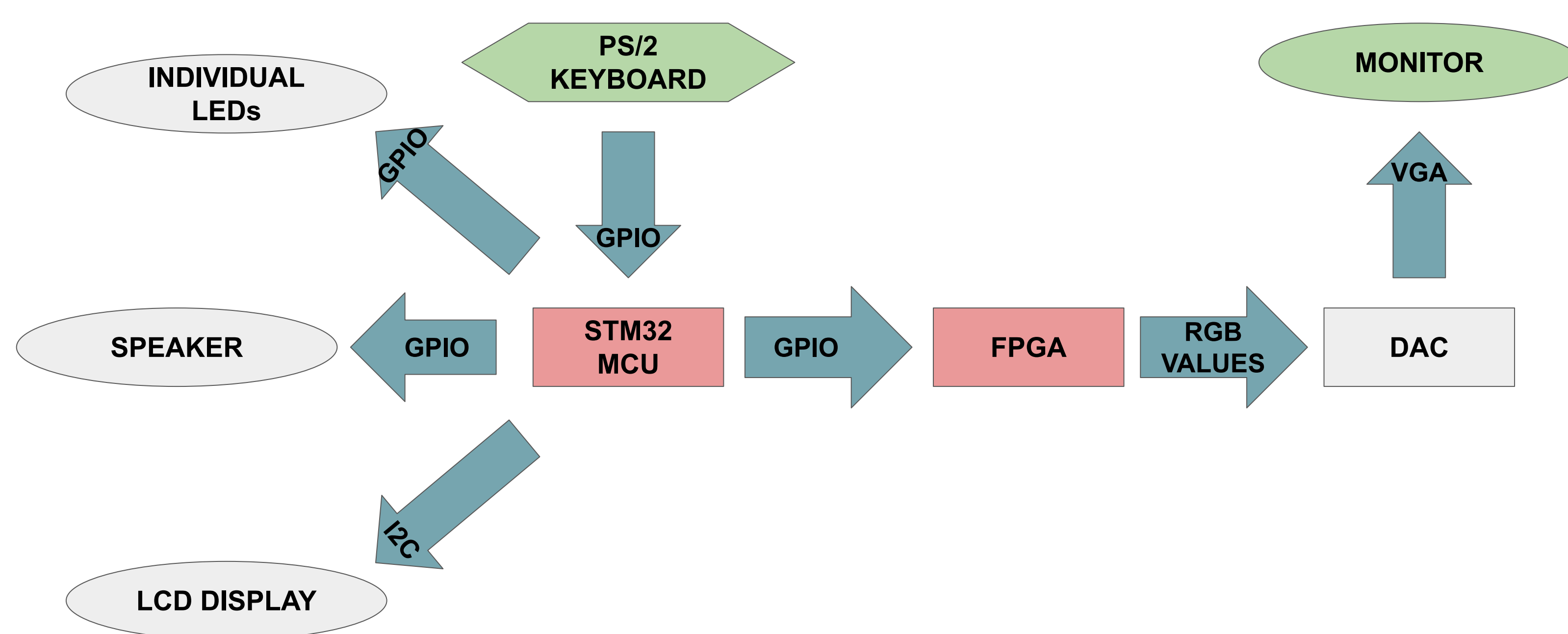
- Receives key presses from the PS/2 keyboard and translates to corresponding characters
- Controls LCD display, speaker, and LED peripherals

FPGA:

- Displays the prompt and user progression on the VGA monitor
- Converts digital RGB values to analog VGA signal using the DAC
- Receives control signals from the MCU

Peripherals:

- LCD display shows the number of words per minute (WPM) typed by the user
- LEDs indicate the current typing speed of the user
- Speaker plays a sound effect when the prompt is completed



Design Loop:

1. **STM32** reads the key presses and updates the **FPGA**.
2. **LCD/LEDs** indicate the current typing speed of the user.
3. **Speaker** plays a sound effect for each word typed correctly
4. **FPGA** updates the prompt progression on the **VGA display**.

Further Improvements:

- Bank of stored prompts that change every time the game is played, with different difficulty options
- Configurable graphics such as fonts, colors, backgrounds, etc.
- More interactive / in-depth leaderboard with names / initials and possibly other statistics

Check out our project on GitHub!

