

# Alkalinity Titrator

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# Background

- The Alkalinity Titrator is part of Dr. Kirt Onthank's Open Acidification project
- Low-cost alkalinity titrations for ocean acidification research
- 4<sup>th</sup> year of development
- Titrator was completely non-functional

# Objectives

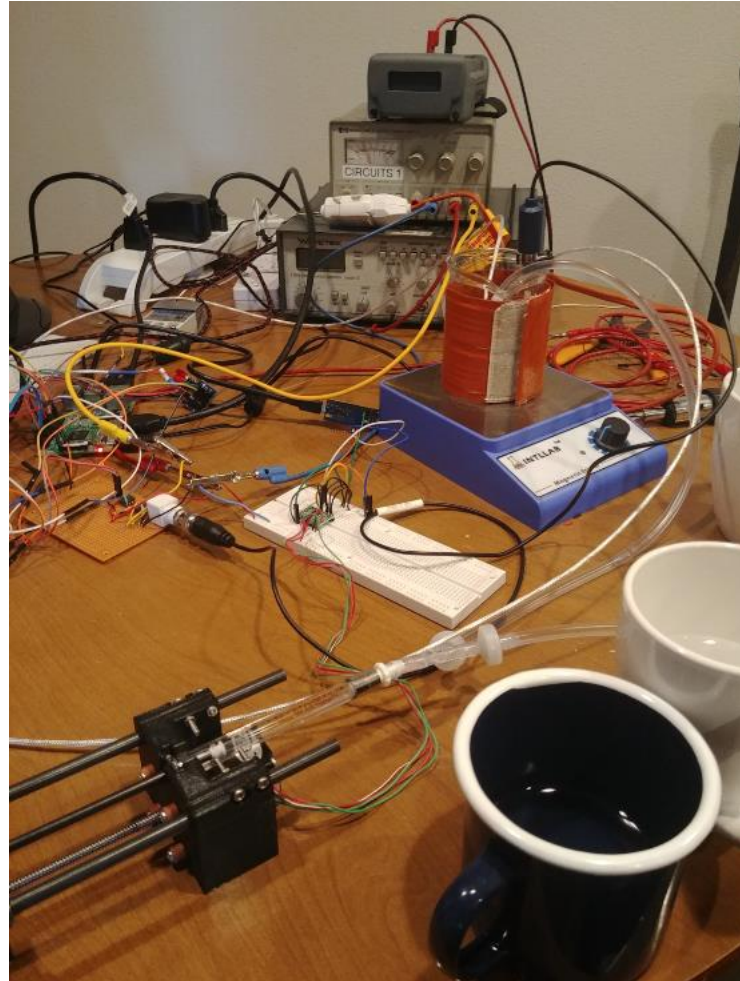
- Remove old code, update the UI states, and create tests for the existing code base
- Integrate real and mock peripheral devices with UI state machine
- Create a mock GUI for future developers
- Implement manual and automated Titrations

## Updating and Testing

- Old code completely detached and removed from the code base
- Current code base passes Python Super-Linter and CodeSpell tests
- Tests for Python 9, 10, and 11
- Removal of depreciated libraries

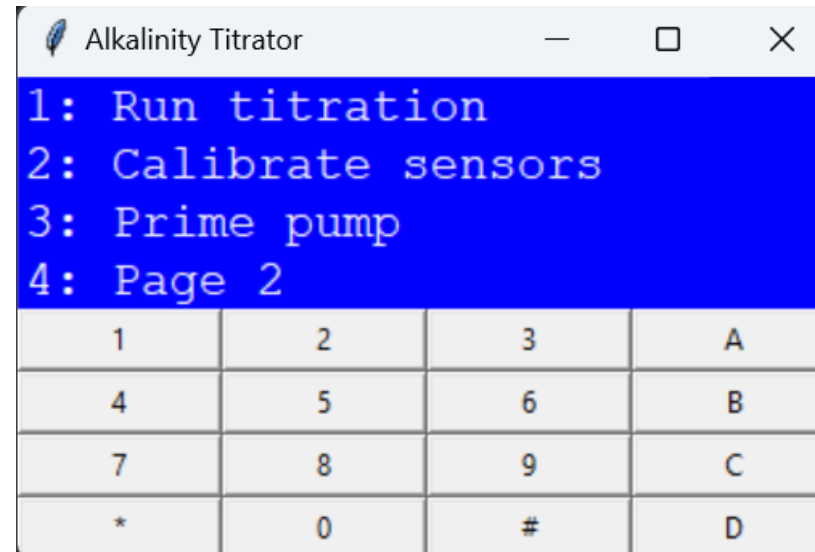
# Peripheral Devices and UI State Machine Integration

- Each device either has a mock or uses lower-level mocks
- Integrated devices:
  - LCD screen
  - Keypad
  - Syringe pump
  - Stir control
  - pH probe
  - Temperature probes
  - Temperature controller



## Mock GUI and Devices

- Replaced old console UI with GUI using Tkinter
- Runs in parallel to the Alkalinity Titrator, updating automatically
- New design is non-blocking, does not wait for user input
- Allows future contributors to be able to develop software without the physical device



# Manual and Automated Titrations

- Continued development is needed to implement both manual and automated titrations
- Basic functionality exists to perform titration but does not have the UI States to step through the titration
- Temperature logging still needs to be implemented to validate titration results

# GUI Demo

# Future Work:

- Sensor readout and input field for the GUI
- Current titration, prime pump, and settings UI States
- Manual and automated titrations
- Existing issues on GitHub

# Questions