

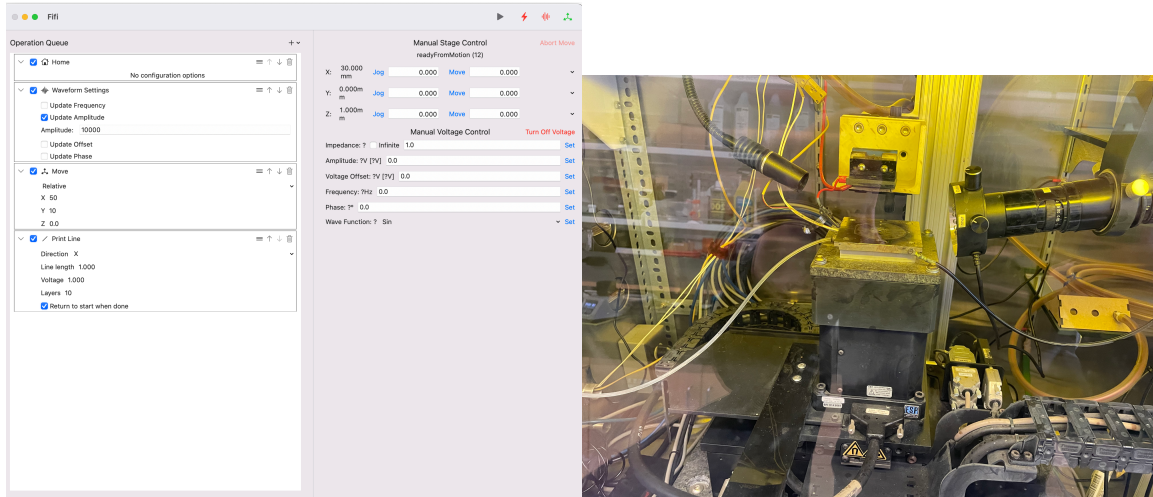
Nano-Inkjet Printer Updates

1. Company Background

Dr. Owen Hildreth is an Assistant Professor in the Department of Mechanical Engineering at the Colorado School of Mines. His primary research is on nanometer to centimeter-scale additive manufacturing technologies. He has written numerous MacOS applications for custom data-collection and visualization as part of his research.

2. Project Description

My group develops a lot of custom software to control our instruments, often with the help of CSM computer science students. The objective of this project is to update our Nano-Inkjet Printer software (Fifi, <https://github.com/HildrethResearchGroup/Fifi>) to expand its capabilities.



Update Fifi with the following Required features:

- Fix bug with the Print Array and Print Lines Commands
- Enable “Burst” capabilities from the Waveform Generator
 - Pulse Duration [ms]
 - Pulse Voltage [V]
 - Pulse Frequency [1/sec]
 - Offset Voltage [V]
 - Waveform Type (square, sin)
 - Number of Pulses [-]
- Create dedicated Burst Command
- Update Print Array and Lines to include Burst as an option
- Update Print Lines to be able to set velocity [mm/s]
- Develop UI for updated Burst Commands
- Develop UI for manual Bursts
- Print from Image
 - Grayscale to dots
 - Logic + UI
 - Darkness set by number of Pulses or Print Time
 - Logic + UI

This project is an excellent opportunity for students to get experience with Swift, SwiftUI, and application design.

2.1 Deliverables

1. Final design report (mandatory for all teams)
2. Working application
3. Clearly documented and marked up code that also leverages Swift's DocC to create the Application and API documentation

2.2 Summary

Develop an application to control the mass flow controllers and furnace

3. Desired Skill Set

Curious, self-motivated, students interested in making useful applications. Experience writing applications for macOS, iOS, or the Swift programming language is a plus.

4. Preferred Team Size

3-5 students

5. Internship Opportunity

Lab research opportunities continuing application within Hildreth's lab.

6. Location for Work

Off-site and on-site at Colorado School of Mines.