Progress Report CW8

start of the bachelor thesis

Introduction to the Problem

Getting the Fluid-FM to resonate at its first order resonant frequency. When trying to excite the cantilever that carries the oil droplet we currently face the issue that the cantilever does not always resonate at its first order resonance frequency but sometimes enters different modes at higher frequencies. Since the mass of the oil droplet at the tip of the cantilever differs in size and density the resonance frequency is not always the same and differs from droplet to droplet and thus from experiment to experiment

Problem Statement

Why exactly is this a problem?

Research Motivation

What would be the advantages if we solve these

Current Approach

problems:

1. higher resonance frequencies, using a low pass filter
2. unstable system, (goes to infinity or maximum) amplitude threshold filter
3. excitement, the threshold filter introduces a new problem it prevents excitement of the oscillation in the beginning. Just applying a step function does not solve it

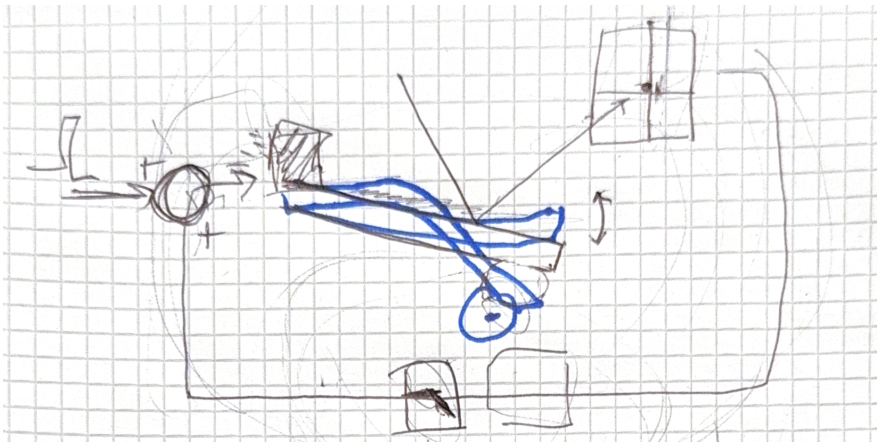

Figure 1: Informal schematic oversimplified representation of a Fluid-FM and the device requirements which are to be designed in the bachelor thesis.

Towards a Solution: Developing a logical Filter

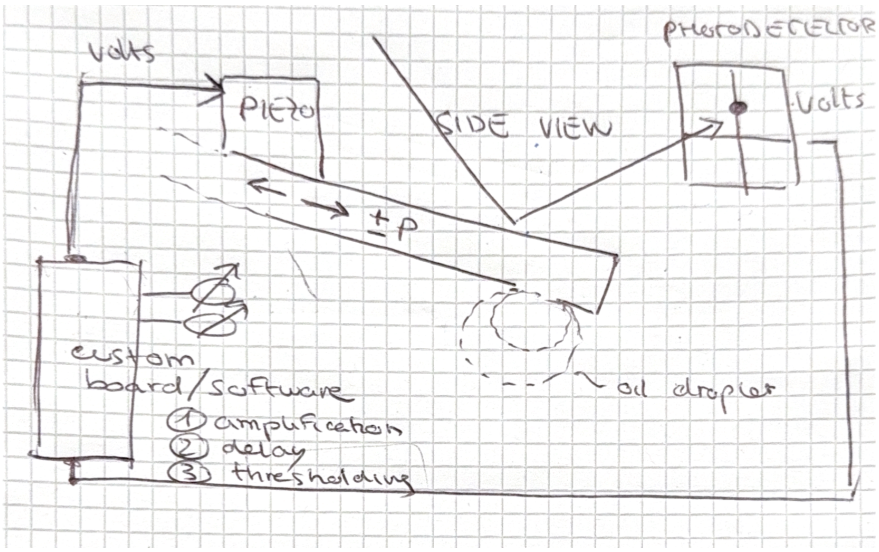

Figure 2: Informal schematic oversimplified representation of a Fluid-FM and the device requirements which are to be designed in the bachelor thesis.

Technical requirements

Hardware Selection

1. Arduino Pro™ Portenta H7 REV2
2. Arduino Pro™ Portenta Max Carrier
3. Arduino Pro™ Portenta Breakout

Technical Requirements

Some technical details here…