EM Filament Project

Mechanical Engineering Capstone Project

Goal and Motivation

- To create an electrically and/or magnetically conductive filament and a machine to produce such filament
- Filament can be used in COTS 3D printers
- Allows for magnetic and conductive objects to be printed in previously impossible or hard to manufacture geometries
- Many applications exist for such a filament, one such being simple electromagnet generators

Approach

- Design a machine which creates the specialized filament
- Machine will homogenously mix plastic such as PETG with powdered metals that have the desired properties
- Mixture will be spooled onto a standard filament roll to be tested in a COTS printer
- Filament will be tested by printing an object and measuring electrical and magnetic conduction

Skills Needed

- Machine will use sensors including thermocouples and encoders
- Analog and/or digital (GUI) input will be used to control machine
- Control systems will run on microcontrollers
- Machine will control motors to mix and spool filament and a thermal system to melt and cool plastic

We are looking for a CS student who can assist with integration of sensors, GUI, microcontrollers, and motors.

Contact Info

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