AUTOMATION AND DESIGN OF A CONTINUOUS HARVESTING SYSTEM FOR MICROALGAE PHOTOBIOREACTORS

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FSU-UFPR SENIOR DESIGN PROJECT PROPOSAL

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OVERVIEW

- GOALS AND OBJECTIVES
- PROJECT COMPONENTS
- SYSTEM SCHEMATIC

GOALS AND OBJECTIVES

[1] Utilize Arduino microcontroller to fully automate microalgal biomass production process

- Microalgal cultivation, collection, flocculation, and separation

[2] Design and integrate a biomass separator to extract solid biomass

- Novel pump implementation
- Batch, semi-continuous, and continuous collection options
- Interface with Arduino Microcontroller

[3] Design and implement a method, process, or technology to facilitate continuous flocculation

[4] Scale up prototyped bioreactor design to full size

3

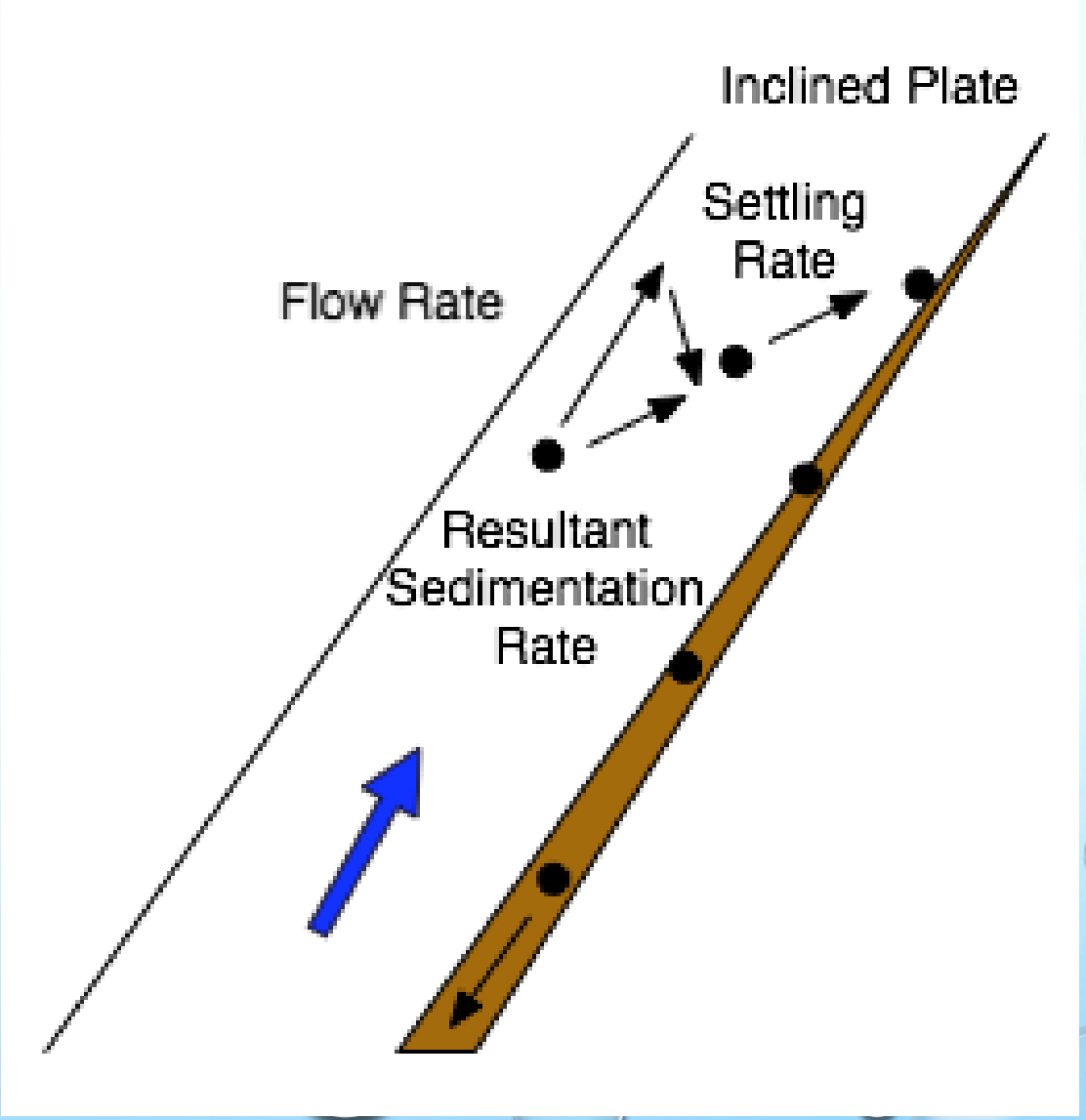
PROJECT COMPONENTS

AUTOMATION BY ARDUINO

- NOTES: ARDUINO IS A SIMPLE OBJECT ORIENTED PROGRAMMING IDE
- MICROCONTROLLER PROGRAMMING
  - LIGHT SENSOR INPUT FOR PUMP RESPONSE OUTPUT
  - FLOW CONTROL (CULTIVATION AND COLLECTION REGIMES)
  - CALIBRATION

BIOMASS SEPARATOR

- FLOCCULATOR – LAMELLA SEPARATOR
  - BASIN, ANGLED PARALLEL PLATES
  - FLOCCULANT
- ALGAE EXTRACTION PUMP
  - WASTEWATER PUMPS
  - SCREW PUMPS



SYSTEM SCHEMATIC