

Development of a Low-Cost Electrical Conductivity Meter for Liquids

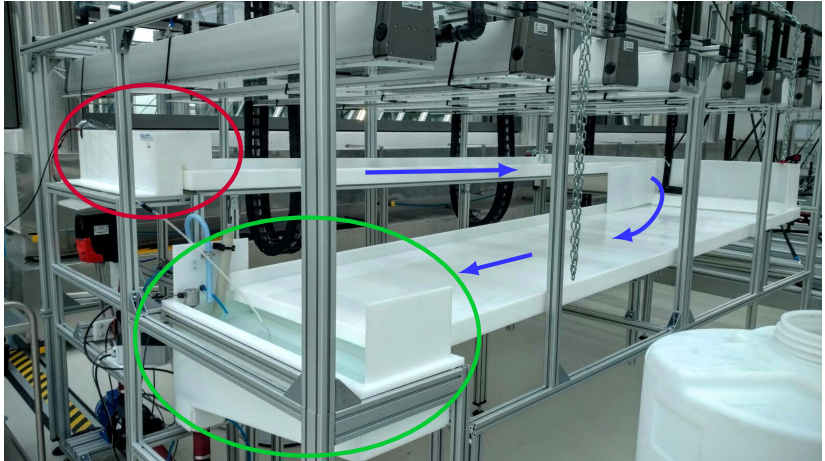
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Outline

- ▶ Introduction
- ▶ Objectives
- ▶ Design
- ▶ Results
- ▶ Outlook

Introduction



Objectives

enable experiments to validate simulation

- ▶ add saltwater impulse to freshwater stream
- ▶ measure changes in salinity over time
 - ▶ at multiple points
 - ▶ fast

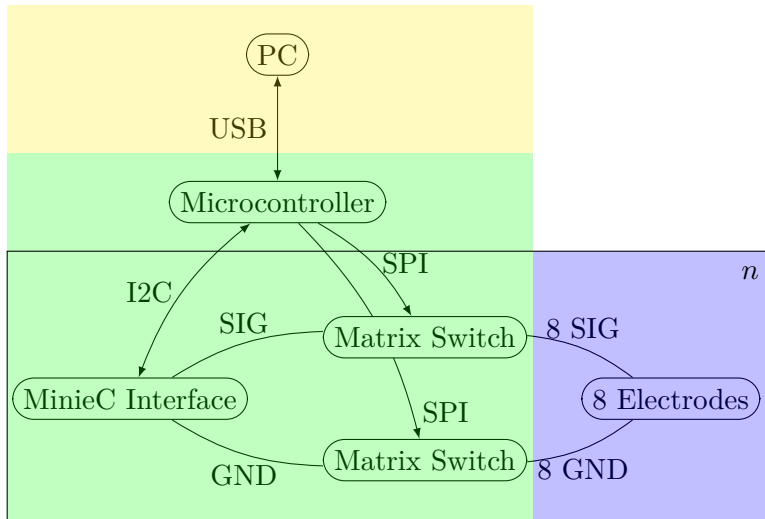
Requirements

- ▶ spacial resolution: 10mm
- ▶ sensitivity: 0.1%
- ▶ range: 0 to 2.5%
- ▶ cost per sensor: < €25
- ▶ deployable in the algae reactor
- ▶ easy to use

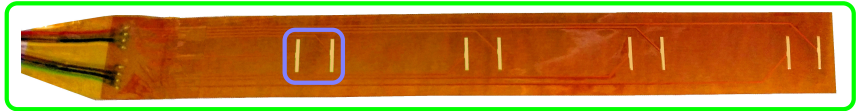
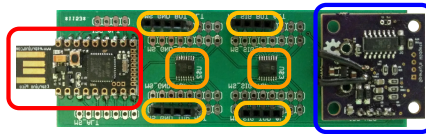
Conductivity

- ▶ ability of liquid to conduct electricity
- ▶ inverse of resistance
 - ▶ liquid is resistance
 - ▶ measure voltage drop over resistance

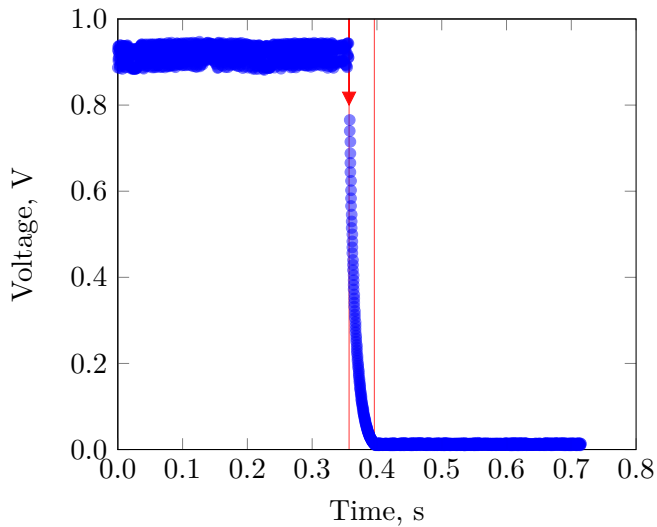
System Design

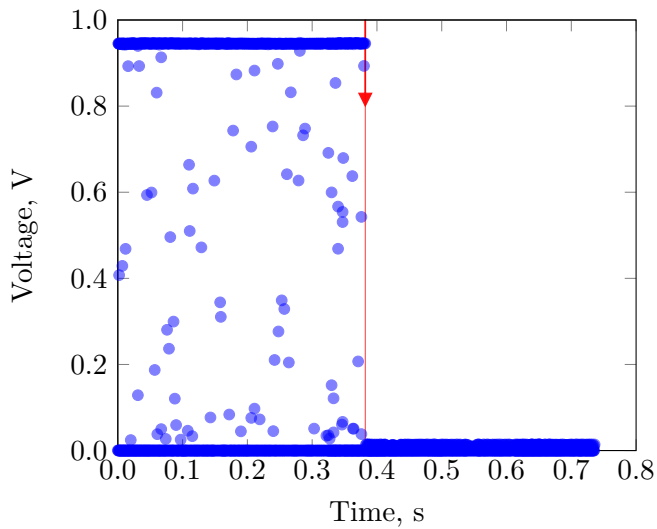


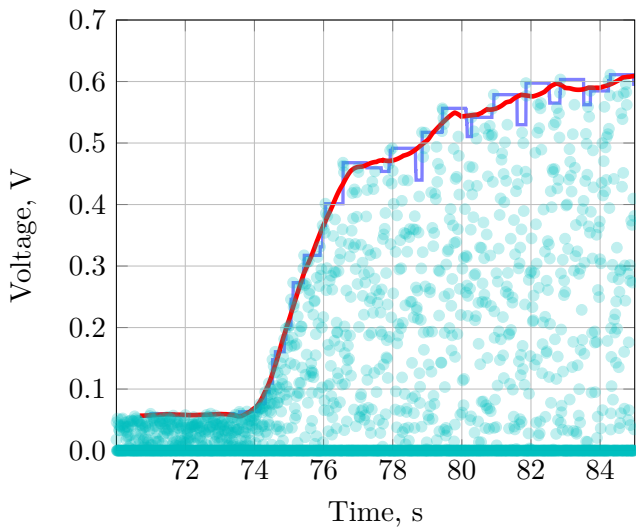
finished Hardware



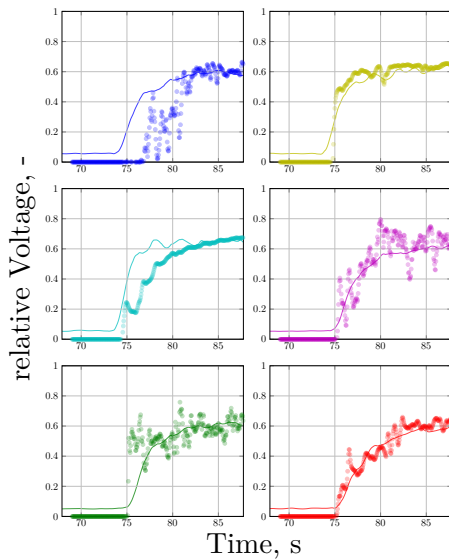
data processing







Results



Demo

Outlook

Problems

- ▶ half-wave due to removal of filter cap makes data ugly
- ▶ only real part of imaginary resistance is measured

Solution

- ▶ move to real impedance measuring

