

**Project Title: Bluetooth pH Meter**  
**Team: Jikang Chen, Siyuan He, Yan Zhao**  
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### **Project Overview**

This project will build a Bluetooth interfaced electronic pH meter that can be used to measure a solution's pH remotely. This enables multiple applications that utilize pH of a solution as a source pH.

### **Project Approach**

This project will model the communication over bluetooth and data sampling into a state machine governed by a timer based controller and a combination of sensor inputs and remote user inputs through bluetooth. This state machine will be able to serve user's request on a timely basis, while maintaining an efficient power usage. Tests will be conducted based on the state machine.

### **Project Objectives**

1. Able to establish bluetooth communication between embedded and remote system
2. Able to get a pH reading from the embedded sensor
3. Able to get a periodical pH reading from embedded sensor through pull/push mode
4. Able to achieve a relatively low power consumption

### **Project Deliverables**

1. A state machine design that achieve product functions in simulation
2. A hardware assembly that execute such code
3. A software system running on the hardware assembly to implement the state machine
4. A simple software app on a remote bluetooth device to communicate with our system
5. A demo or video to demonstrate the process
6. An assessment on the measurement effectiveness and power efficiency

### **Project Constraints**

- Time: we only have about 1.5 month to complete this along with other classes
- Money: we are only given \$200 to spend on this project
- Knowledge: we have limited knowledge about sensors and power management

### **Risk and Feasibility**

There are many unknowns. Such as how the pH probe will perform and how vulnerable is the device and how accurate the reading is, since we are looking for accurate pH readings. Moreover, since we will not be designing the hardware from scratch, we may not be able to control the power consumption as we want it. However, we will still demonstrate our algorithm such that it can work on custom designed systems in the future.

Another slight risk would be connection with the remote iOS device. This risk should be very slight since there are many existing library and protocol. If by any change the connection with iOS device won't work. We will use android device as a backup.