Wireless pH Sensor

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Background

The pH was first introduced in the early 1900s to scale acidity and alkalinity of different substances. Since then, measuring pH accurately and conveniently is vital for various fields, including medical diagnostics, pollution detection, and more. While the idea of digitally measuring pH is flourishing, not many of them have focused on automatic measurements, long-period continuous measurements, and cloud-based measurements.

Goal

To build a device that simplifies the process from acquiring pH electrical signal to finalize the results by utilizing wireless transmission technology. This grants users the accessibility to multiple data records through only one personal device anytime anywhere (internet required).

Milestone

1. By the middle of this quarter, we would like to make our new pH sensor design functional. Improve the parameters of envelope detector to extract the modulated signals.
2. Reduce the interference (such as parasitic capacitance) from other components on the circuit in the demodulation process.
3. Develop algorithm for processing and managing pH value data.
4. Finish mobile APP implementation by the end of this quarter, enable pH value data visualization.

Progress

1. Finished implementing the registration web page, now users are able to register their own account which is designed for mobile app login.
2. Finished mobile App login page and registration page implementation.
3. Finished Cloud-base database implementation and built the connection between the ADC board, the Pi and the server.
4. Finished debug process of transmitting circuit.
5. Performed wireless power & data transmission through hand-wired coil.

Reference

[1] Docs.aws.amazon.com. (2019). [online] Available at: https://docs.aws.amazon.com/index.html [Accessed 4 Nov. 2019].

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[3] B.Santhanam, P.Maragos "Multicomponent AM–FM demodulation via periodicity-based algebraic separation and energy-based demodulation" IEEE Transaction on communications, vol. 48, no. 3, pp. 473-490, March 2000.

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