

AMK

Underwater Wireless Sensory Networks

An aerial photograph of a coastal region. A multi-lane highway runs diagonally across the upper right portion of the image. Below the highway, there are several large, irregularly shaped plots of land, some of which appear to be agricultural fields or industrial sites. The terrain is a mix of light brown and tan colors, suggesting dry earth or sand. In the lower left, there is a large, dark, irregularly shaped area that could be a body of water or a large shadow. The overall scene is a mix of natural and man-made elements.

@gamer456148

Introduction.

Why I entered this challenge?

Mission statement about cleaning our oceans?

Importance of Sustainability

Prototype 1

Experience

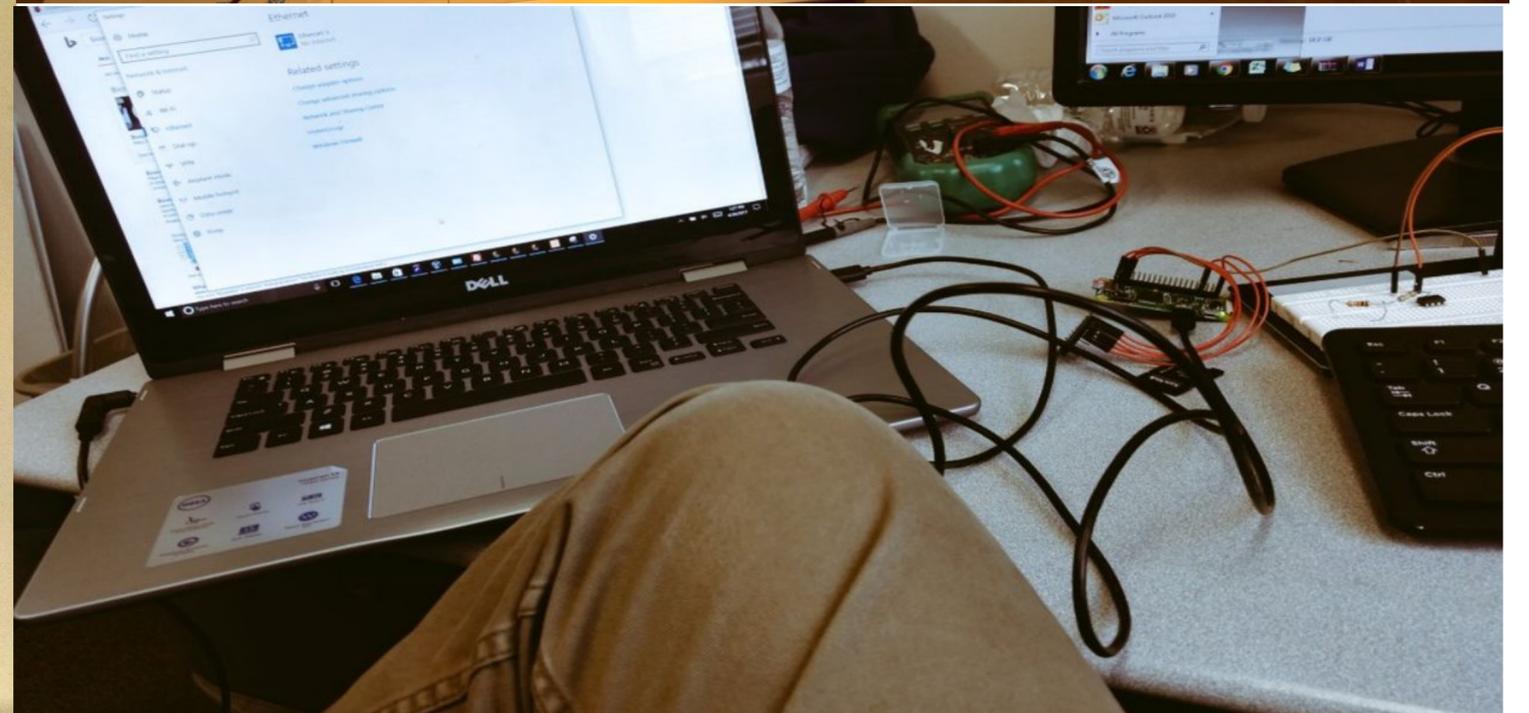
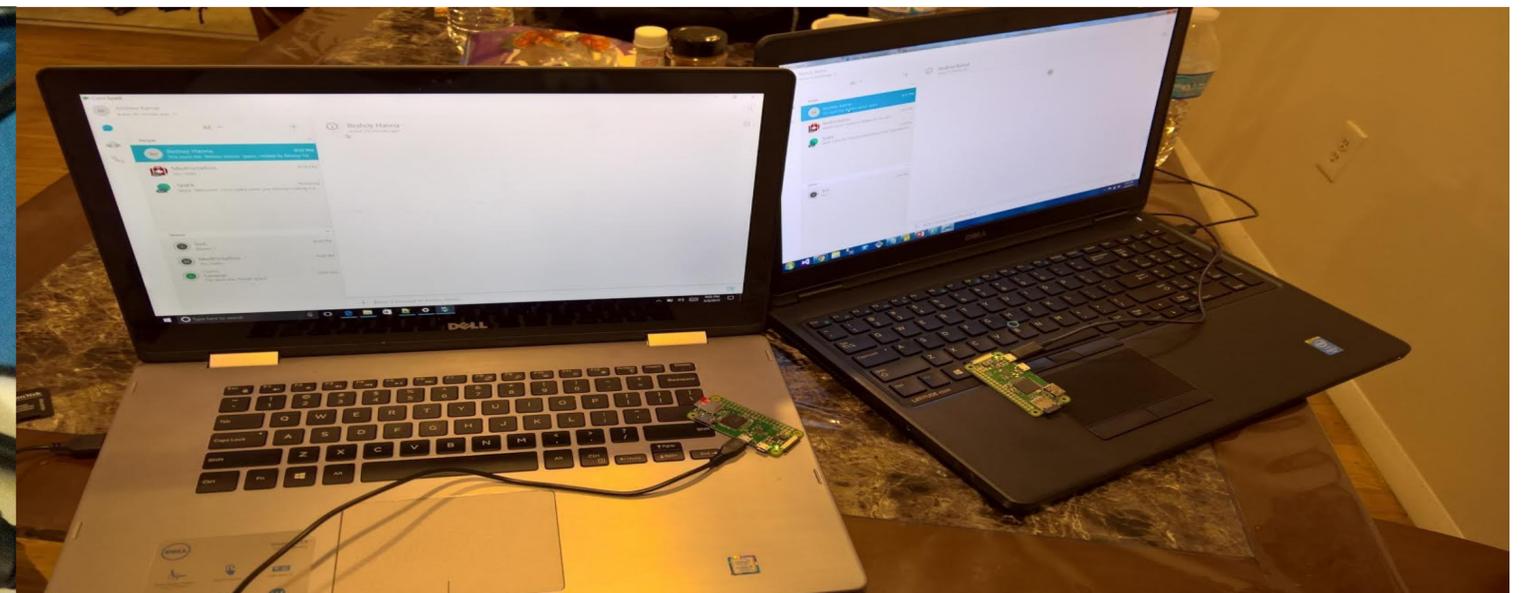
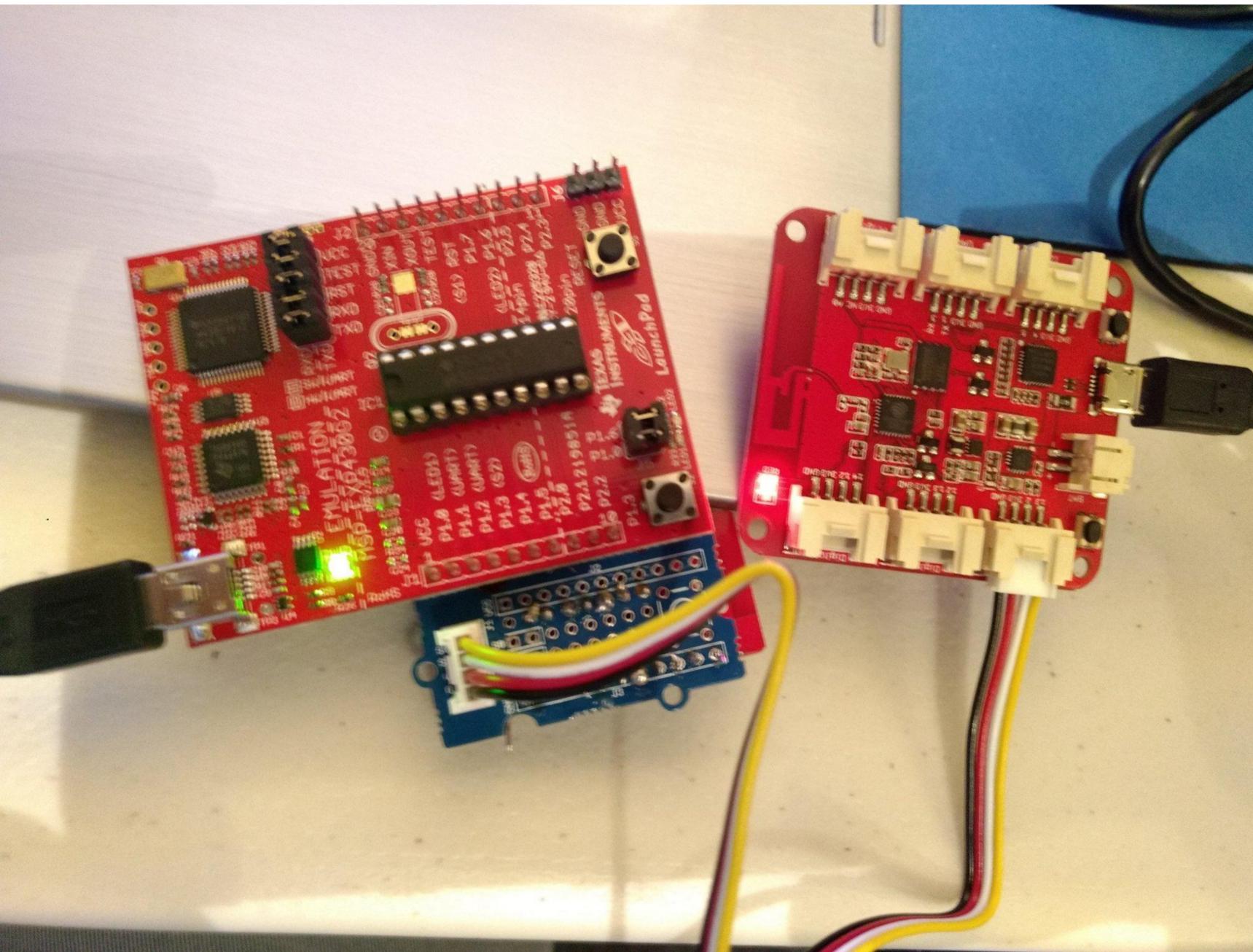
The first prototype ended up using an Optical sensor, the WIO Link, and a sonar sensor to garnish data underwater. We didn't get that long of a signal for it so we ended up creating an converter for it to redeploy the prototype and garnish better data.



(Image is clickable: <https://www.youtube.com/watch?v=8UFHW3HUmfk>)

Reinventing the Internet

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Some of the Networking Aspects

The converter utilizes a PHAT IOT shield, and a MSP430G TI dev board
All code is in C, the Arduino language, Java (Rest APIs), and Shell script
(Also talk about the decentralized nodes and decentralized "tower free" networking)

Prototype 2

Experience

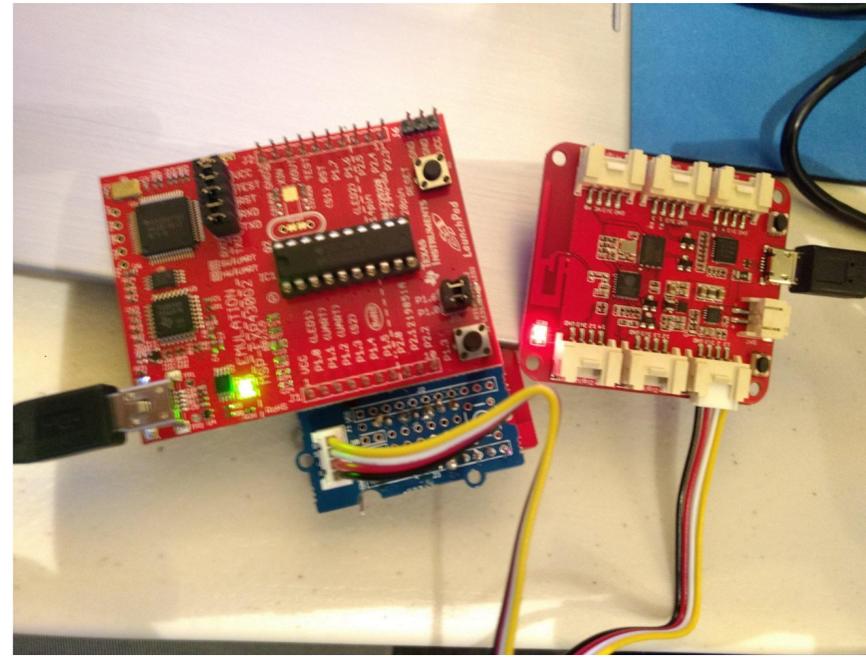
The first prototype had a minor fail over because of a water proofing issue. Once we added the converter, there wasn't enough space to close the seal all the way and it ended up getting loose when we took it out of the water. It still was connected for a while underwater.

The second prototype, we decided to measure chemical detections using oscillations, a data logger, Arduino, and for power we utilized a mini solar panel to charge the Arduino when it is out of the water, and a rechargeable lithium ION.



Photo Gallery

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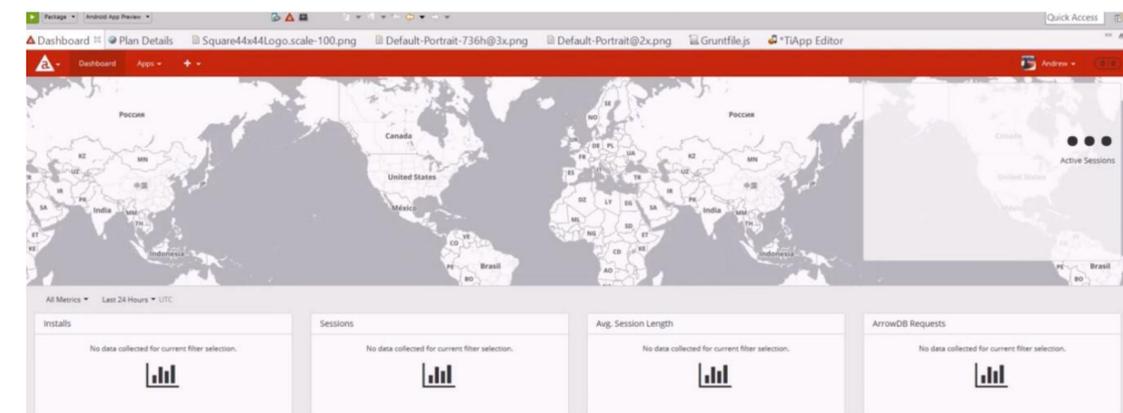
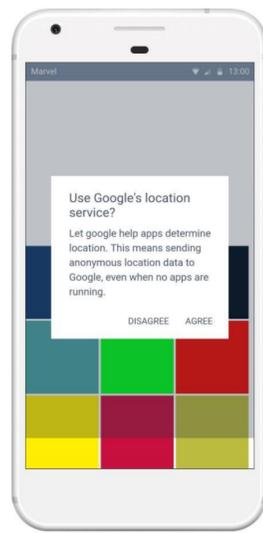
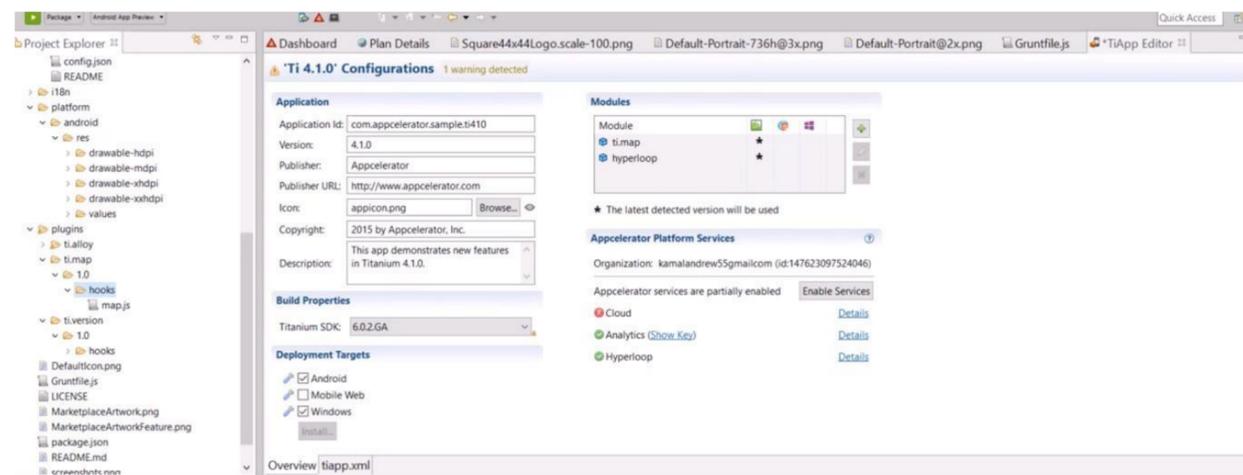
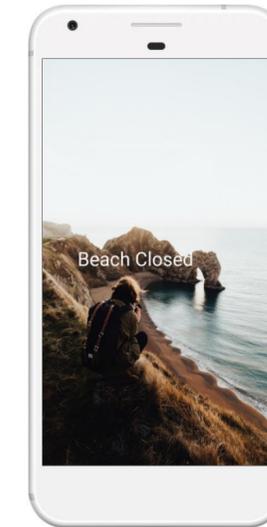
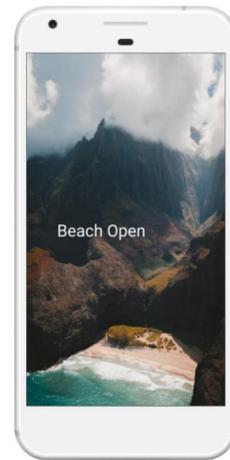
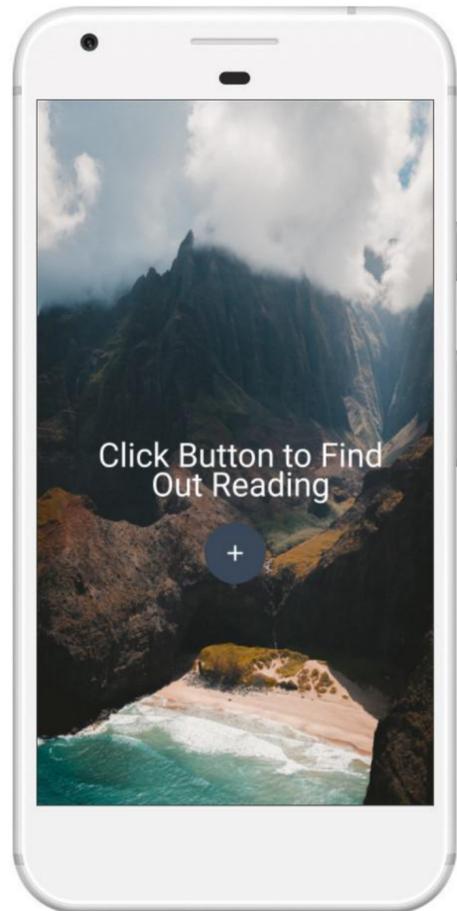


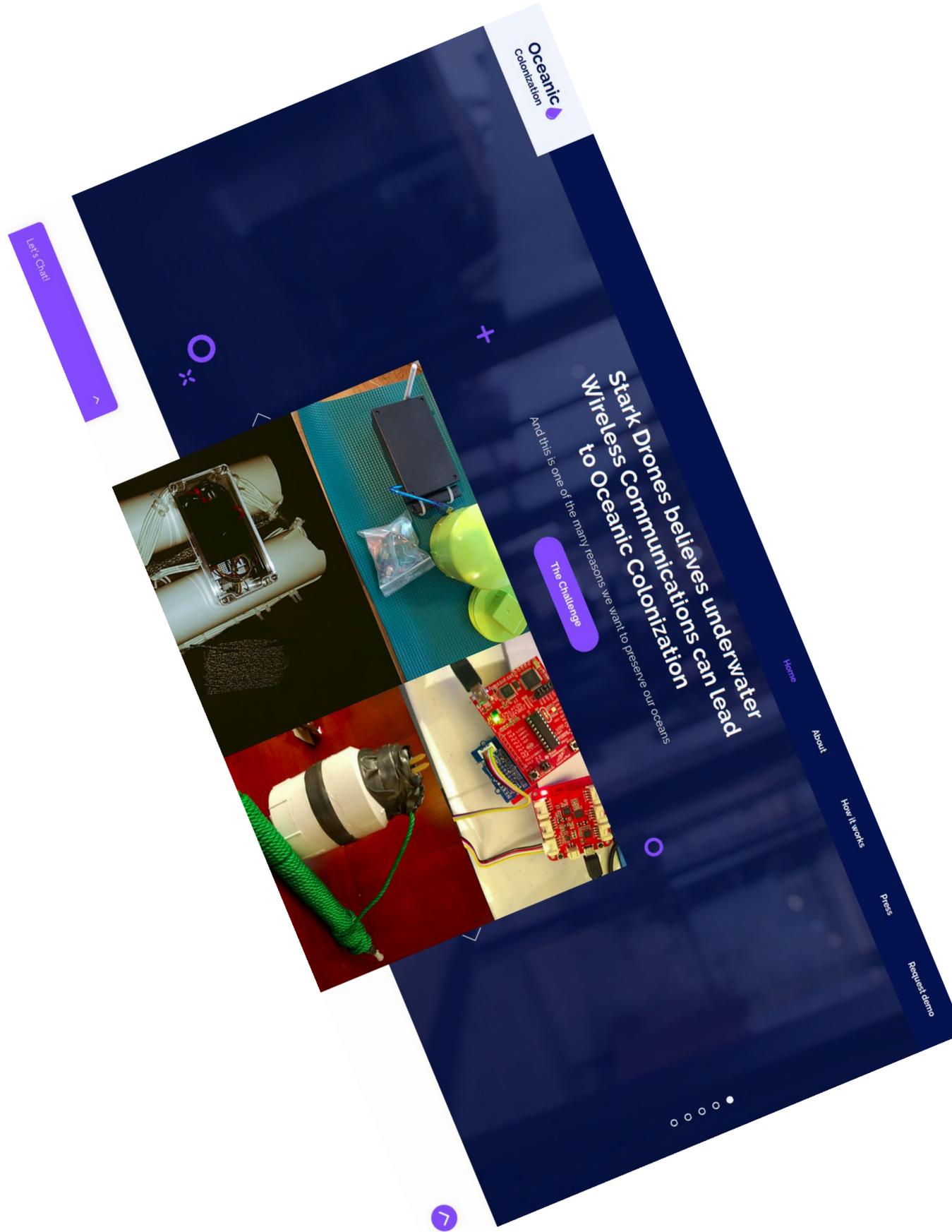
P2P Connection Module



Our App, Software Integrations & Future Applications

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The Future

The OCEANIC Colonization Data Challenge

ABOUT CLASSIFY TALK COLLECT

We are launching a huge data challenge related to Oceanic Colonization, get involved today!

Find where we can build "underwater" cities

[Learn more](#)
[Get started](#)

This project has been built using the Zooniverse Project Builder but is not yet an official Zooniverse project. Queries and issues relating to this project directed at the Zooniverse Team may not receive any response.



WORDS FROM THE RESEARCHER

"I believe that underwater WiFi can lead to greater technology for the benefit of humanity, and oceanic colonization may be part of our future in sustainability"

ABOUT THE OCEANIC COLONIZATION DATA CHALLENGE

In the past, I have done experiments with underwater wireless networking and believe that this can lead to point to point communication in our oceans while outputting noiseless signals. Technologies like this, and many others are what can make oceanic colonization possible. In the future, there will be tunnels, elevators, and underground systems allowing access to underwater cities or access points of artificial land. Oceanic Colonization is one of the biggest potential solutions to sustainability and allocation of resources in our planet's future. Right now, however there are a few questions that need to be answered such as, "where can we put underground cities?" or "how do we make sure the positive outweighs any potential negative environmental consequences?". This is why this challenge was launched.



Advertising

We do have connections with marketing and advertising firms already and I have a set plan on how I will distribute everything into the market. I have marketed or done successful fundraisers or crowdfunding before.



Broadcasting

We are planning on releasing a crowdfunding campaign. Right now each prototype without lab access cost us \$130. With lab access cost around \$65, and with access to manufacturing or PCB express costs us about \$18. We plan to release about 1.4k sensors for preorder through crowdfunding if we got the capital and support to do so.



Developing

Spend a few more month further developing our applications and make it more friendly to have a better launch in the market



Branding

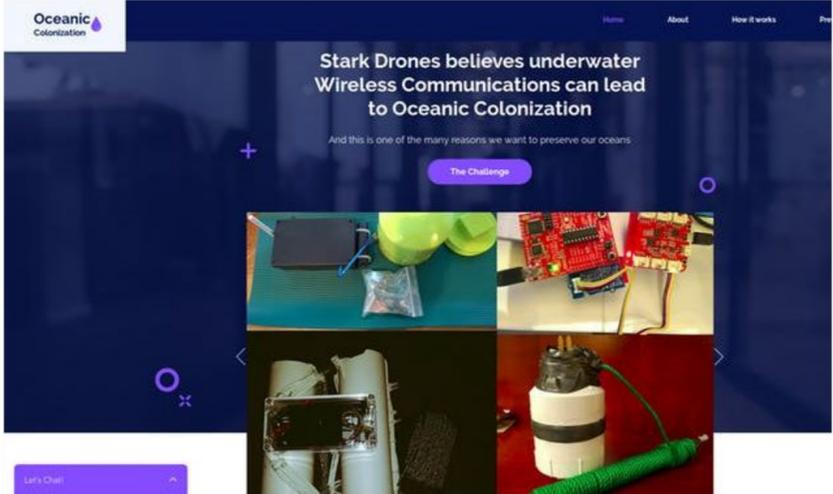
We also plan to release many paid and open source apps into the market. This includes working on an orthomosaic photo extension, the app we talked about earlier, and commercial monitoring solutions.

What we will do with the Funding and/or venture support?

Traction

Underwater Internet • Save the Oceans & Colonize the Ocean | Spread the Word!

INTERNET OF THINGS Wi-Fi +2



UPVOTE 6

Website www.oceancolonization.com

SEND TO PHONE

SOCIAL

RELATED PRODUCTS

Carbon Trim
Discover carbon footprints of daily actions!

OCTO @OCTODC · Jan 22
Check out #GigabitDCx semi-finalist, Andrew Kamal demo an Underwater Wireless Sensory Network that can track information about our waterways with a noiseless signal. RSVP gigabitdcxlive.splashthat.com

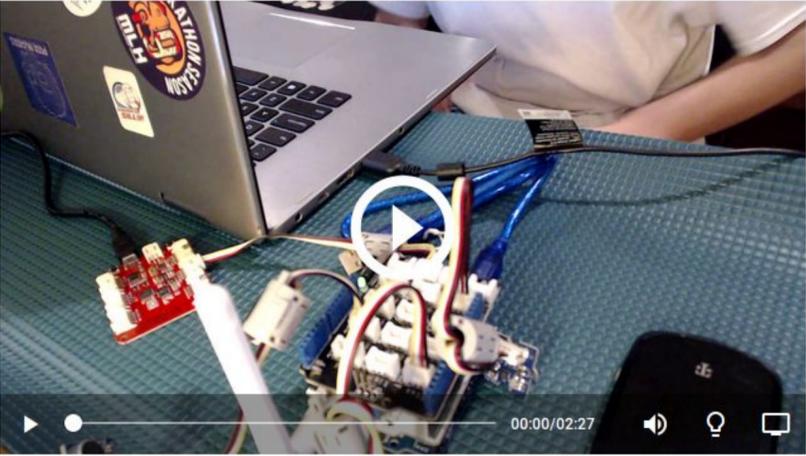
@DOEE_DC @AnacostiaTrust @AnacostiaRrkper @PotomacRiver @MWCOCG @anacostiaws



0:35 | 1,810 views

Andrew Kamal
JAN 9, 2019, 6:25:22 PM

I am doing some interesting things using the WIO Link :)



2

1,046

OCTO Retweeted



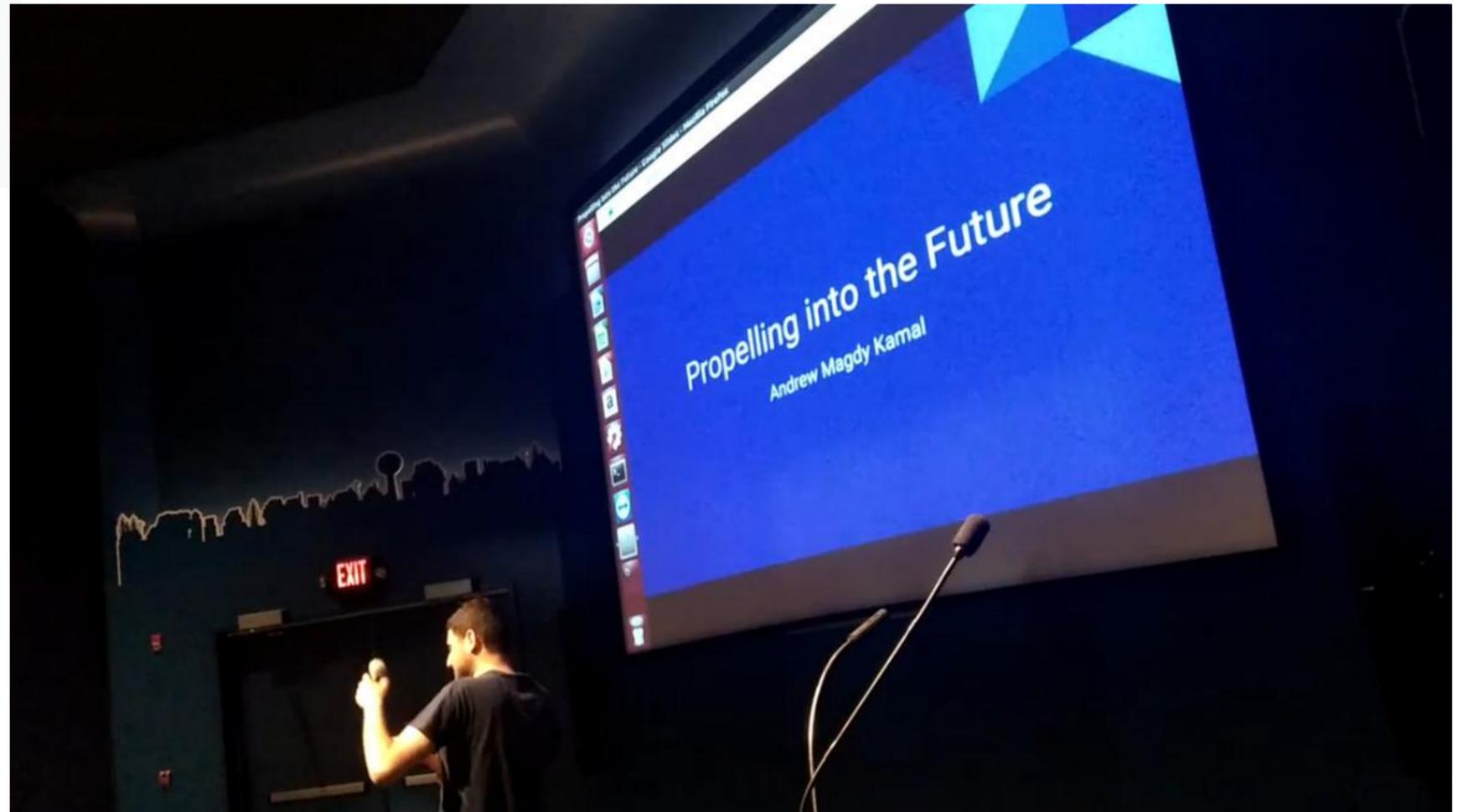
Department of Energy and Environment @DOEE_DC · Jan 22

Underwater Wireless Sensory Network? How cool is that!
Count us in to check out the semi-finals next Wednesday!
[#GigabitDCx](#) [#SustainableDC](#)



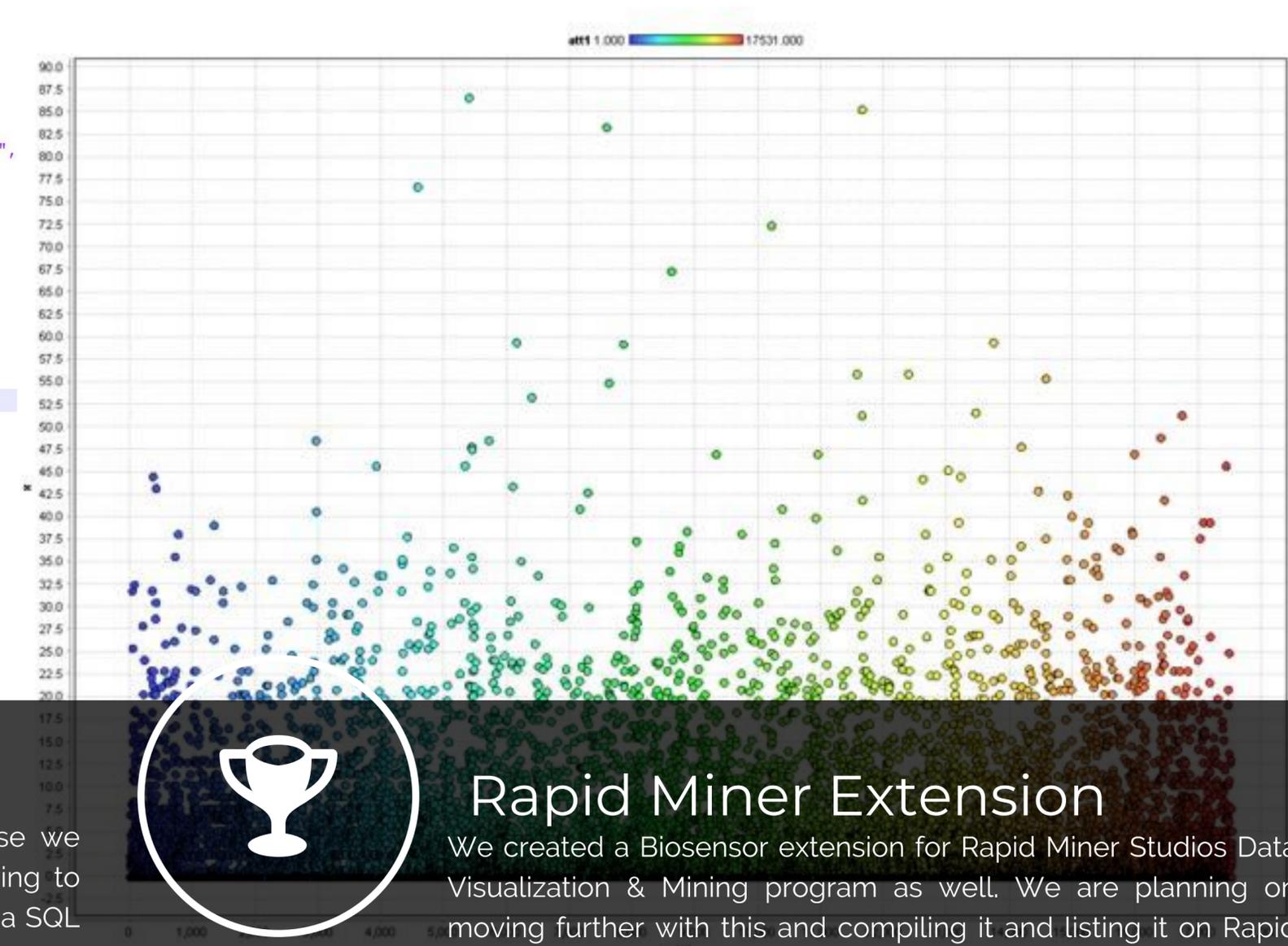
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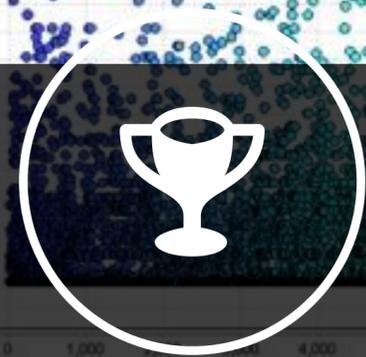
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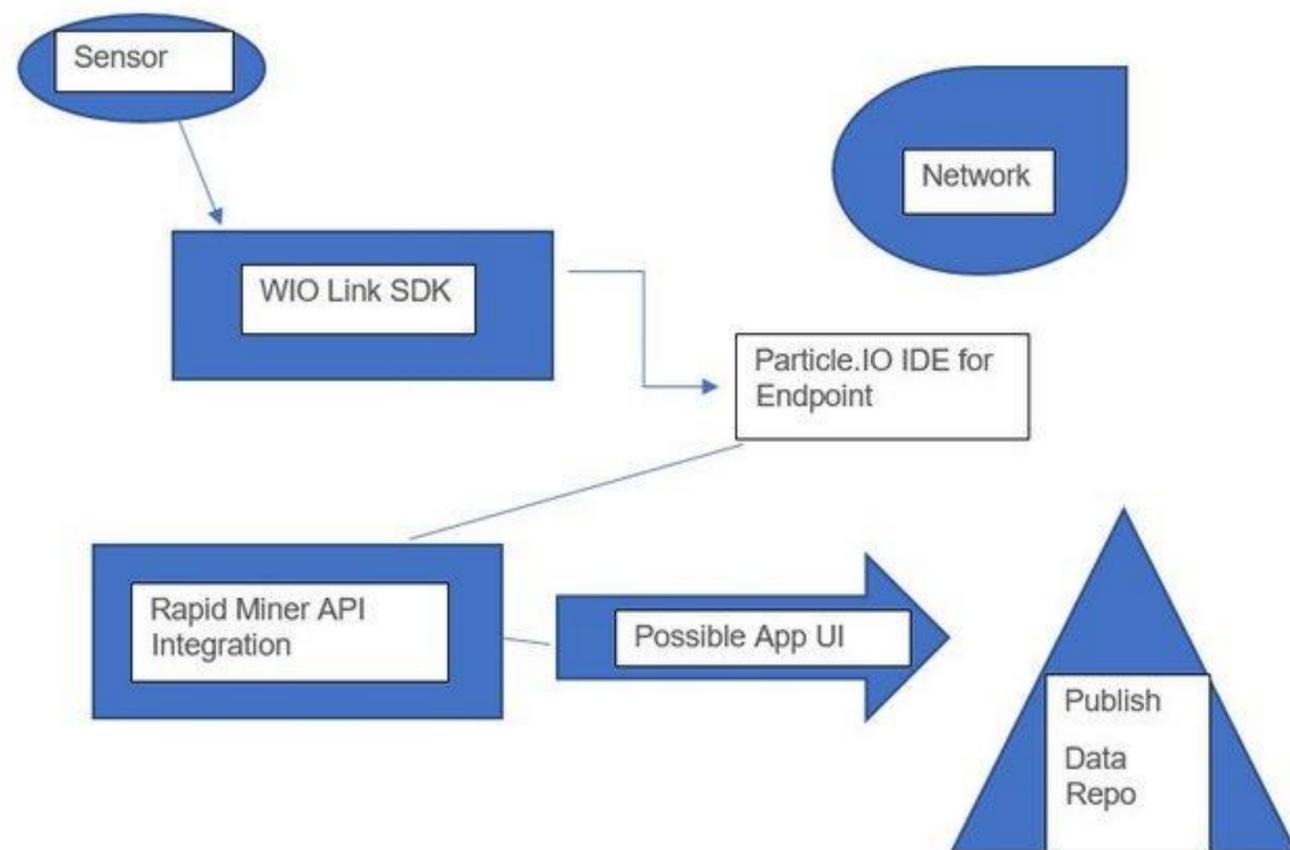
XML Data

We got some raw XML data that needs some cleaning up because we usually export from CSV. The GLOS submission had a 404 error trying to access it, we can work on submitting open data but want to integrate a SQL database and Web UI for simple data navigation for users



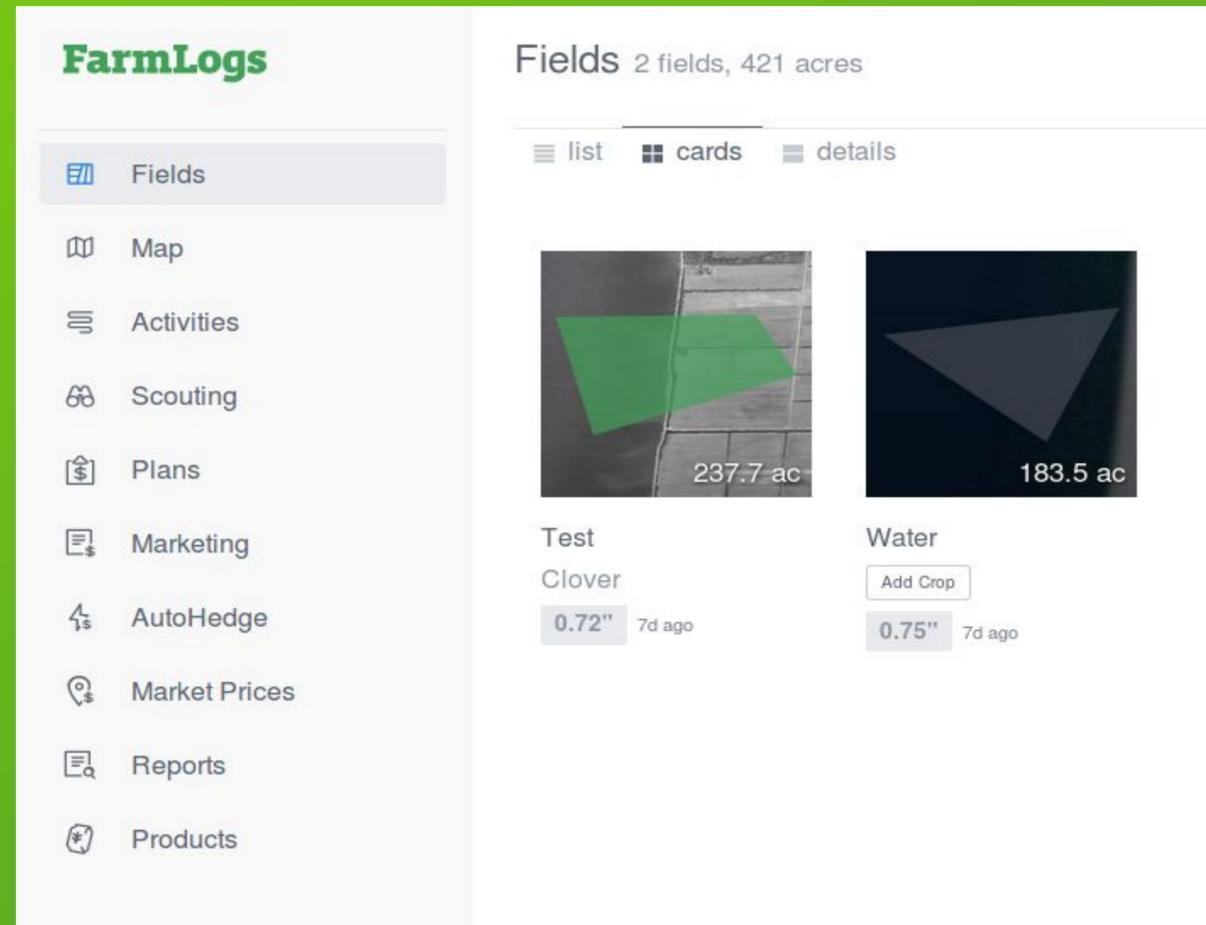
Rapid Miner Extension

We created a Biosensor extension for Rapid Miner Studios Data Visualization & Mining program as well. We are planning on moving further with this and compiling it and listing it on Rapid Miner's store pending approval



We collect data in real time software defined networks. Compared to the YSI model 6600 v2 and other sensory networks, we use less technological infrastructure, making us much cheaper. Our sensors also can get alot done, and can even replace biochemical testing as well. Beach water testing methods or models that take experimentation and over 24 hours to get data is no longer a problem. We are replacing over \$30k+ worth of equipment with low cost devices. Our sensory models include the following: Moisture and PH reader (Model 1), (Optical and Nano-Sensory (Model 2), and we have a P2P Connection module (Peer 2 Peer or Point 2 Point) that allows the extension of our wireless reaches. We can help predict when we would need to do nutrient offloading or monitor chlorophyll A using Model 2's optical sensory system or Spectrophotometry.

Future Integrations



FarmLogs API Connected Devices (Or Similar Service)

Underwater Telecom Modules

Q & A Session w/ Judges