Corrosion Detecting Robot 1.0

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UCSB PIPELINES

Mission Objective

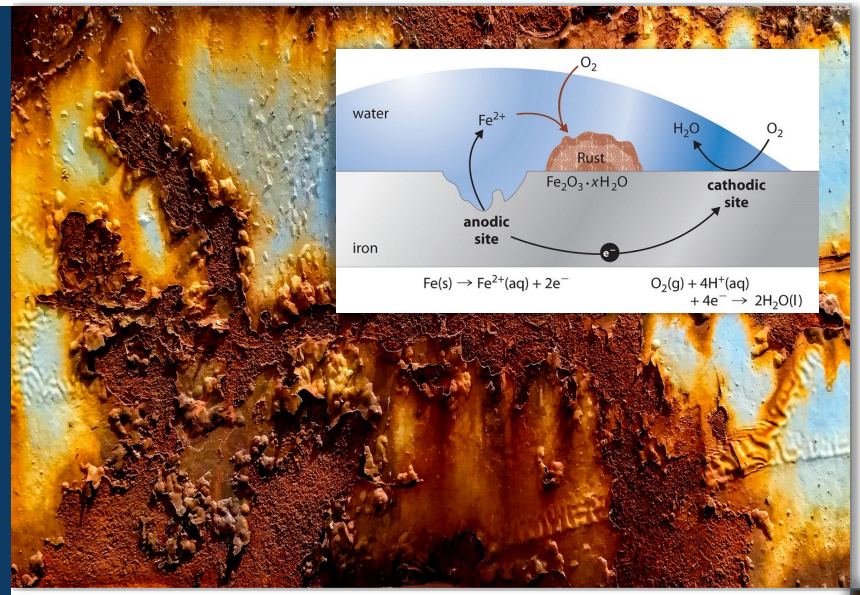
The mission objective of this project was to engineer a robot integrated with corrosion detection capabilities that can maneuver through a shipboard environment.

Methods Used

- Additive Manufacturing
  - Fused Filament Fabrication
- Coding and Programming
  - Arduino IDE
  - C++
- CAD Models
  - SolidWorks
- Steel Q-Panel Testing
  - Voltmeter

Contribution

- Coding and programming.
- Procured the logistical requirements for the prototype.
- Designed and assembled the robot.
- Conducted an experiment to help distinguish corroded and non-corroded materials.



What are you most proud of this summer?

- Being part of NAVSEA and surrounded by like-minded individuals with the same goal: to innovate and broaden our knowledge on materials science.

Why was the internship valuable?

- Gained additional knowledge regarding corrosion, its formation, and detection.
- Learned the engineering design process of technical reviews and risk assessments prior to production.

Advice for future cohorts?

- CAD simulations to test the over-all mobility of the robot.
- Be knowledgeable of restricted distributors and vendors.
- Expect logistics delay.

Results / Accomplishments / Next Steps:

- We demonstrated that by using Ohm's Law, we can distinguish corroded and non-corroded surfaces by measuring and comparing their voltage and resistance.

- The use of corrosion-detecting robots can save the Navy a significant amount of money and improve the safety of its ships and sailors while reallocating man-hours into a more critical mission.

- In the future, this project will assist in automating corrosion detection, treatment, and prevention to execute the Navy's mission.