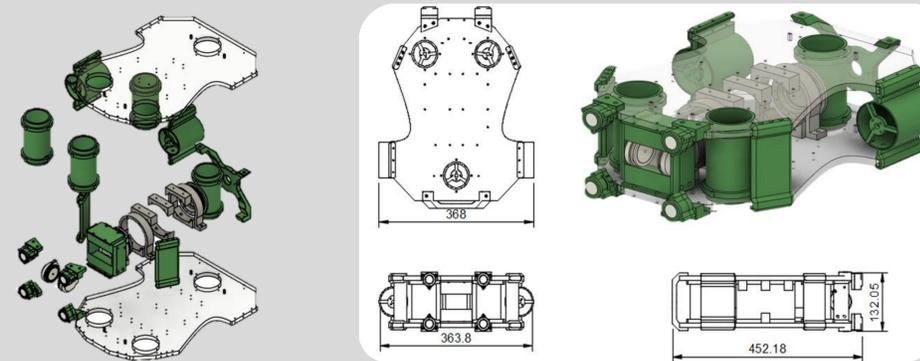


Problem Statement

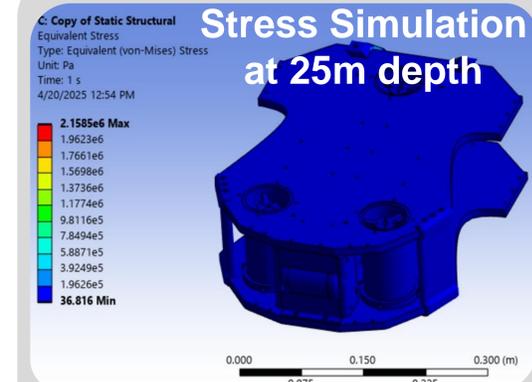
Traditional underwater inspections are costly, complex, and labor-intensive. This project proposes an affordable, AI-powered Miniature Autonomous Submarine for automated monitoring and real-time defect detection, reducing dependence on costly equipment and specialized personnel.

Prototype Design

3D Model & 2D Drawings



Testing & Validation



Constraints & Specifications

Constraints

- Maximum dimension of 50 cm.
- 2. Operating depth of 3 meters.
- 3. Carry a minimum of 0.5 kg.
- 4. Operating in 40g/dm³ salinity.
- 5. Budget less than SR 10000.

Specifications

- Maximum weight is 7 kg.
- Maximum speed is 7 kg and 2knots.
- Flow resistance 1 knots.
- Rise/fall speed 1 knots.
- Corrosion less than 10 microns/year.
- Communication up to 10 m.
- Operate for 1 hour on a charge.
- Autonomous operation.
- Image resolution is 12MP.

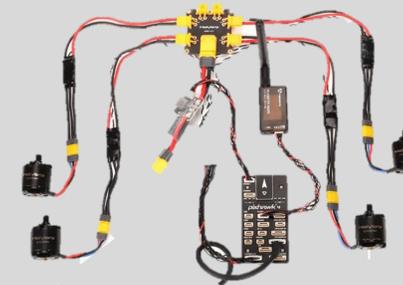
Motors



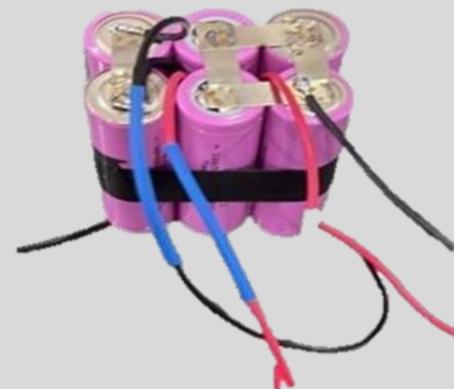
Insulation Pipes



Electrical System



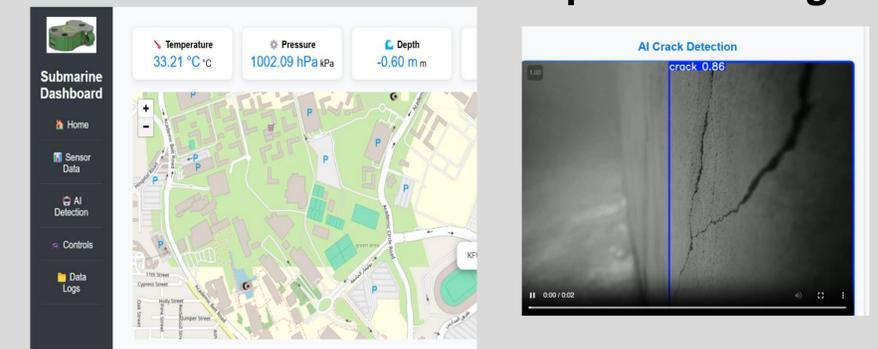
22,800 mA Battery



2MP camera



Dashboard and Crack inspection using AI



Total Cost	6200 SAR (tools included)
Total Weight	4.3657 Kg (can carry min 0.5kg)
Power Consumption	82.5Wh with supply 12 V Operating 1.25 hours with normal operation

Conclusion

The Miniature Autonomous Submarine effectively provides affordable, AI-powered underwater inspection and monitoring.