Underwater Survey System

DRUSE-TH09-555

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Theme

Theme - Underwater Survey System

- ➔ Unmanned vehicle to be conceptualised to reach the underwater bed (6m depth)
- ➔ To be able to crawl and negotiate underwater obstacles
- ➔ To measure various terrain parameters across its width (100m) and generate the bed profile
- ➔ Technology targeted: underwater mobility, soil bearing capacity measurement, current negotiation, self-extraction, underwater imaging

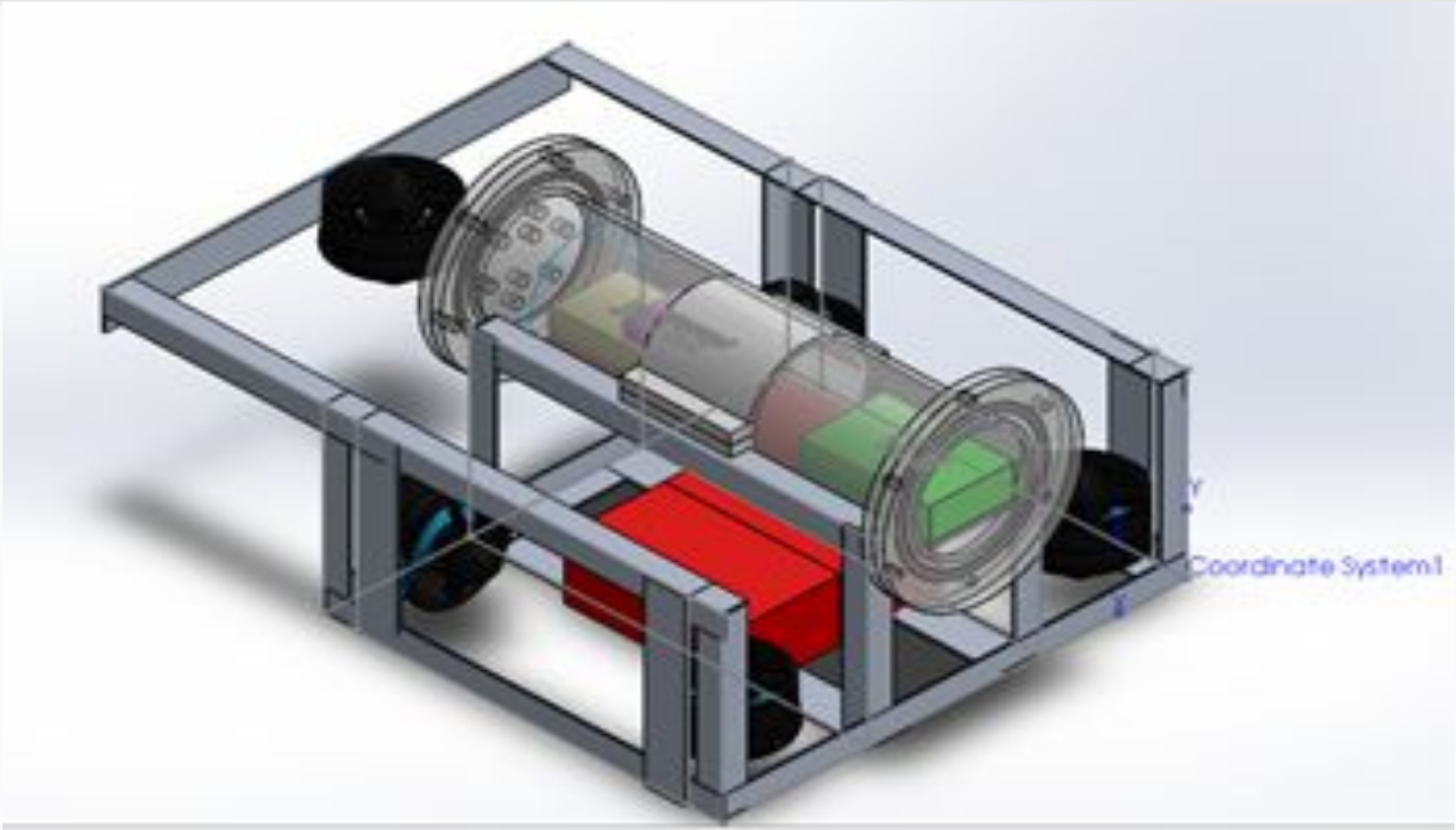
Introduction

Introduction

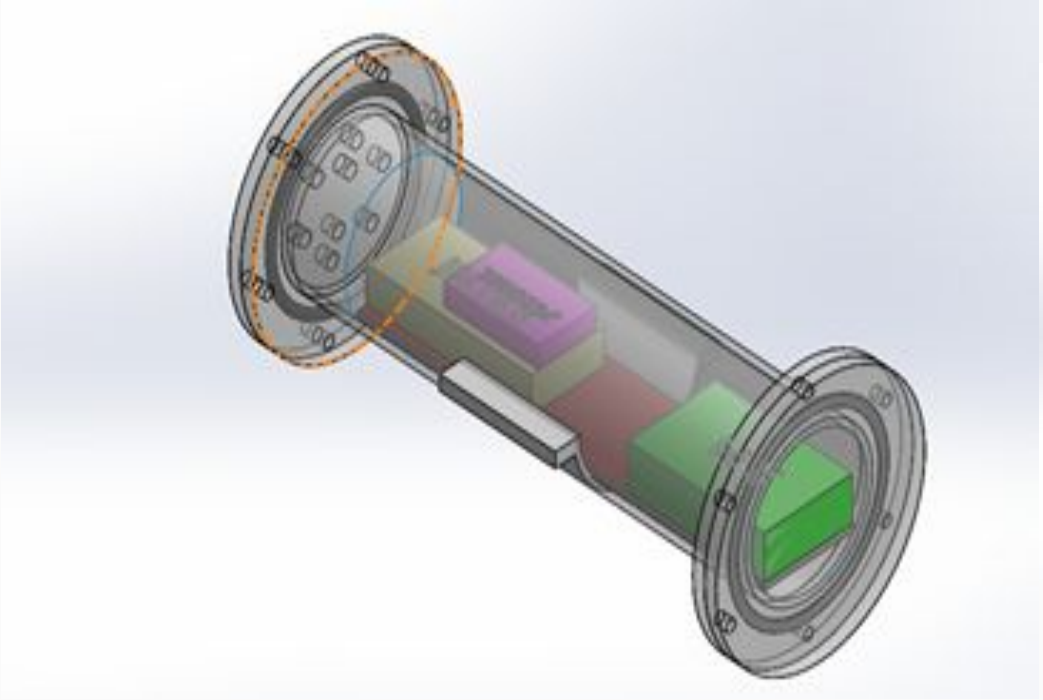
- Underwater Remotely Operated Vehicles (ROVs) are remote control underwater robots driven by individual on the surface.
- Proposed bot can reach upto depth (40 metres) as per theoretical calculations.
- Bot can be safely maneuvered negotiating obstacles in its way with the help of live streaming to the user.
- May be used to measure various terrain parameters and generate the underwater bed profile.
- Various underwater objects, even organisms can be detected using underwater imaging in the future.

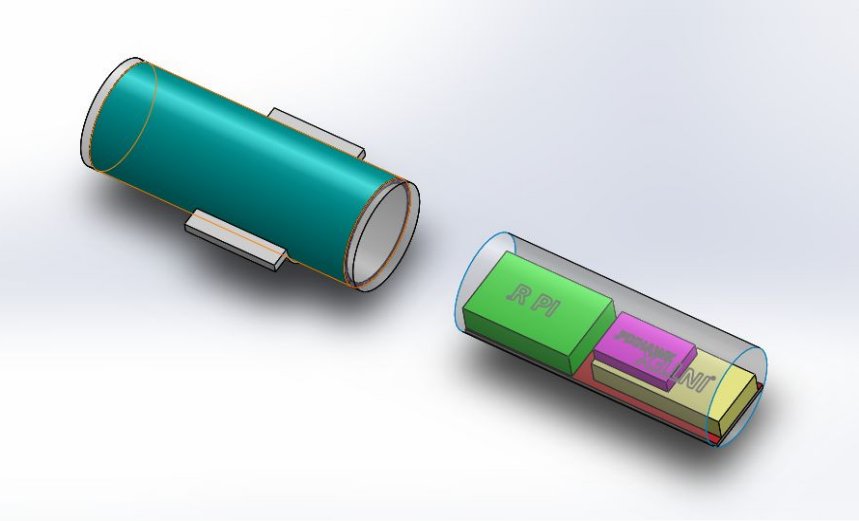
Design

Current Model - Finalised Structure

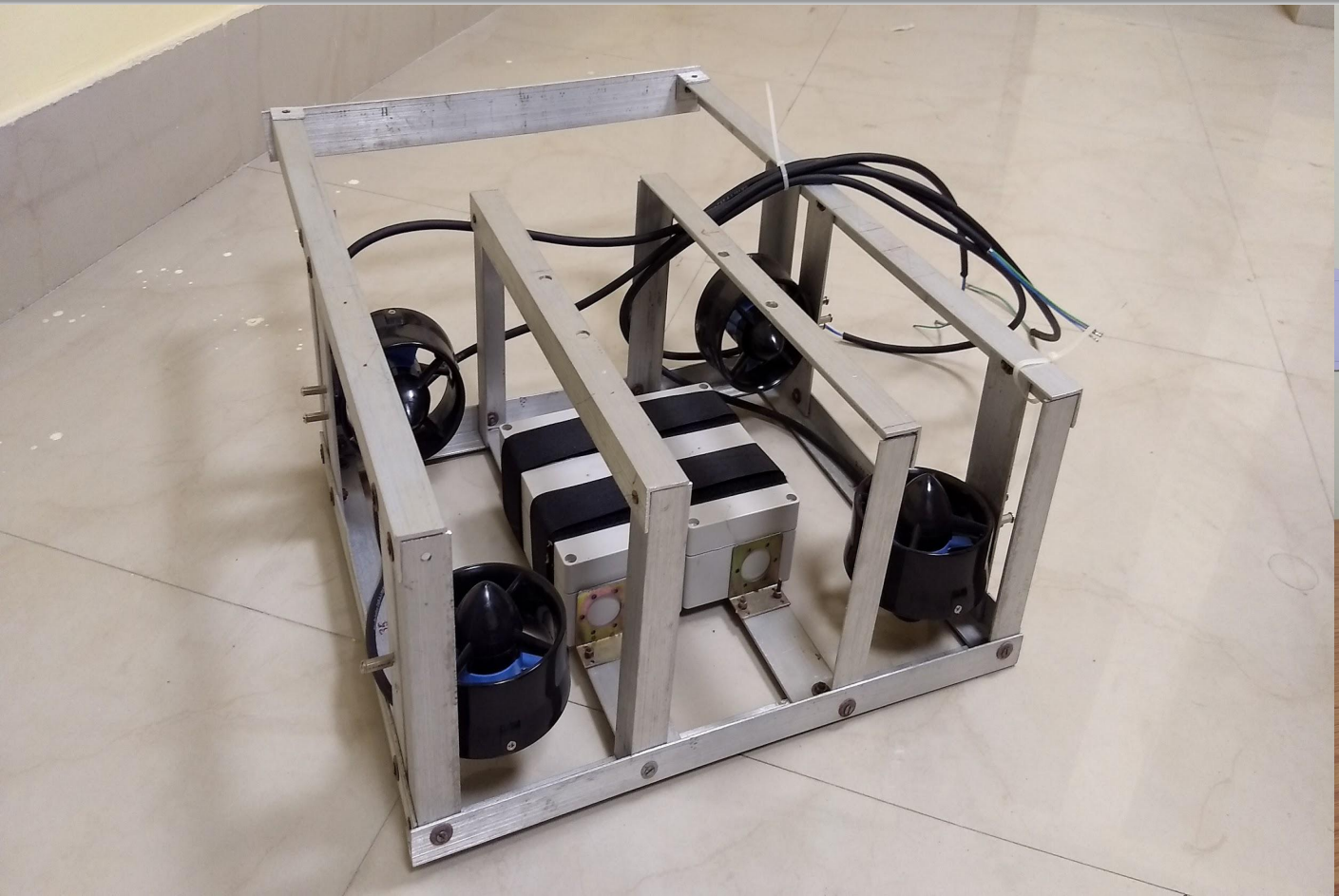


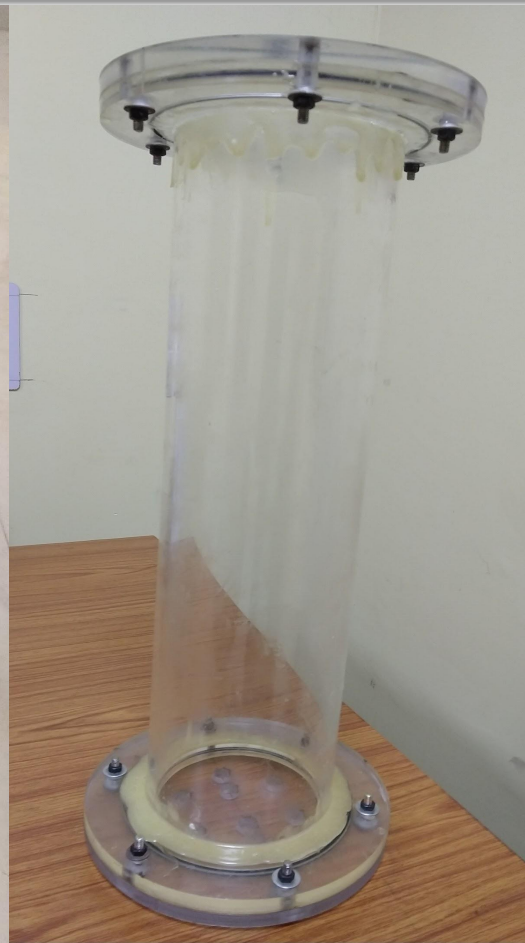
Hull with the Electronics



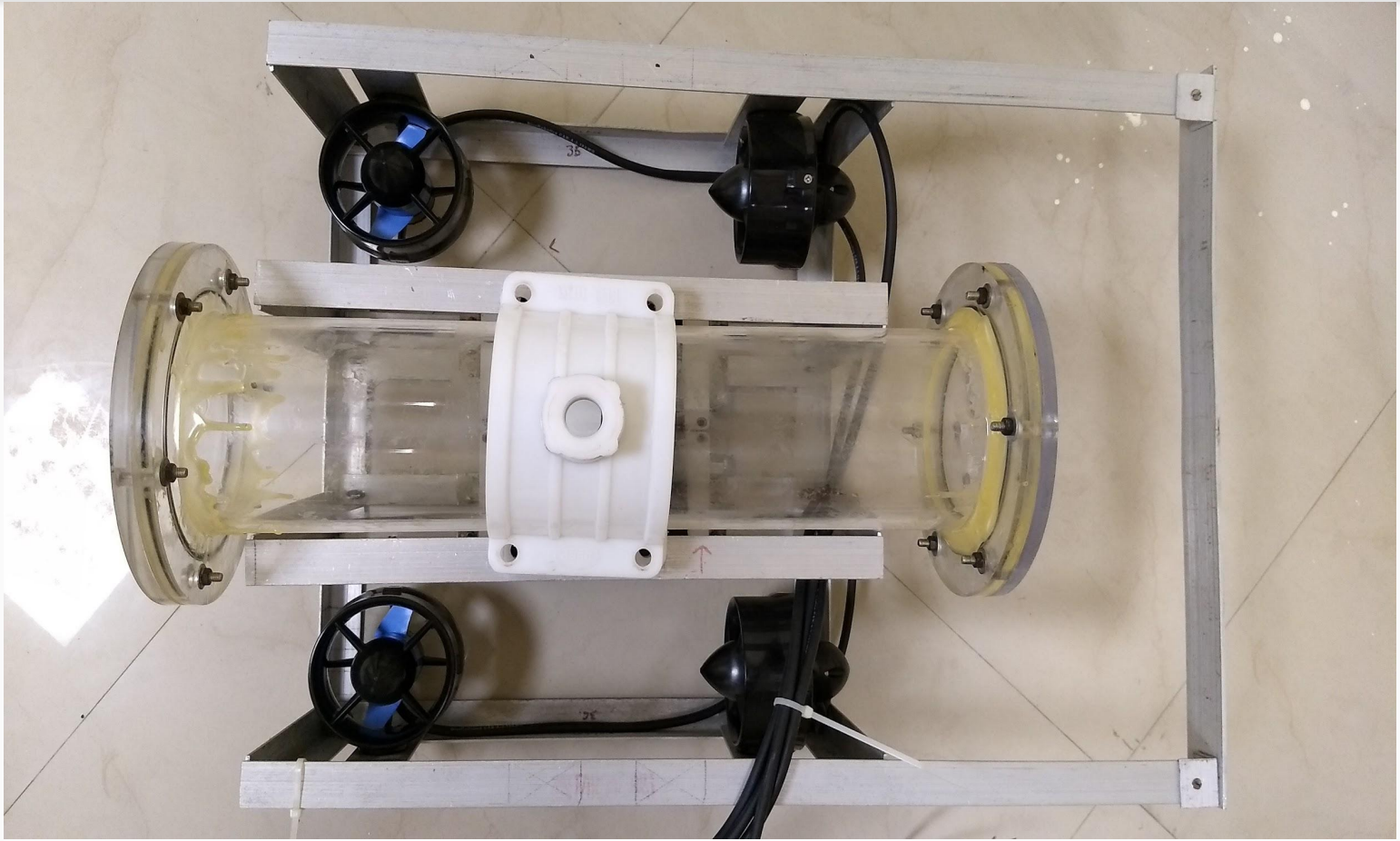


Main Frame & Hull

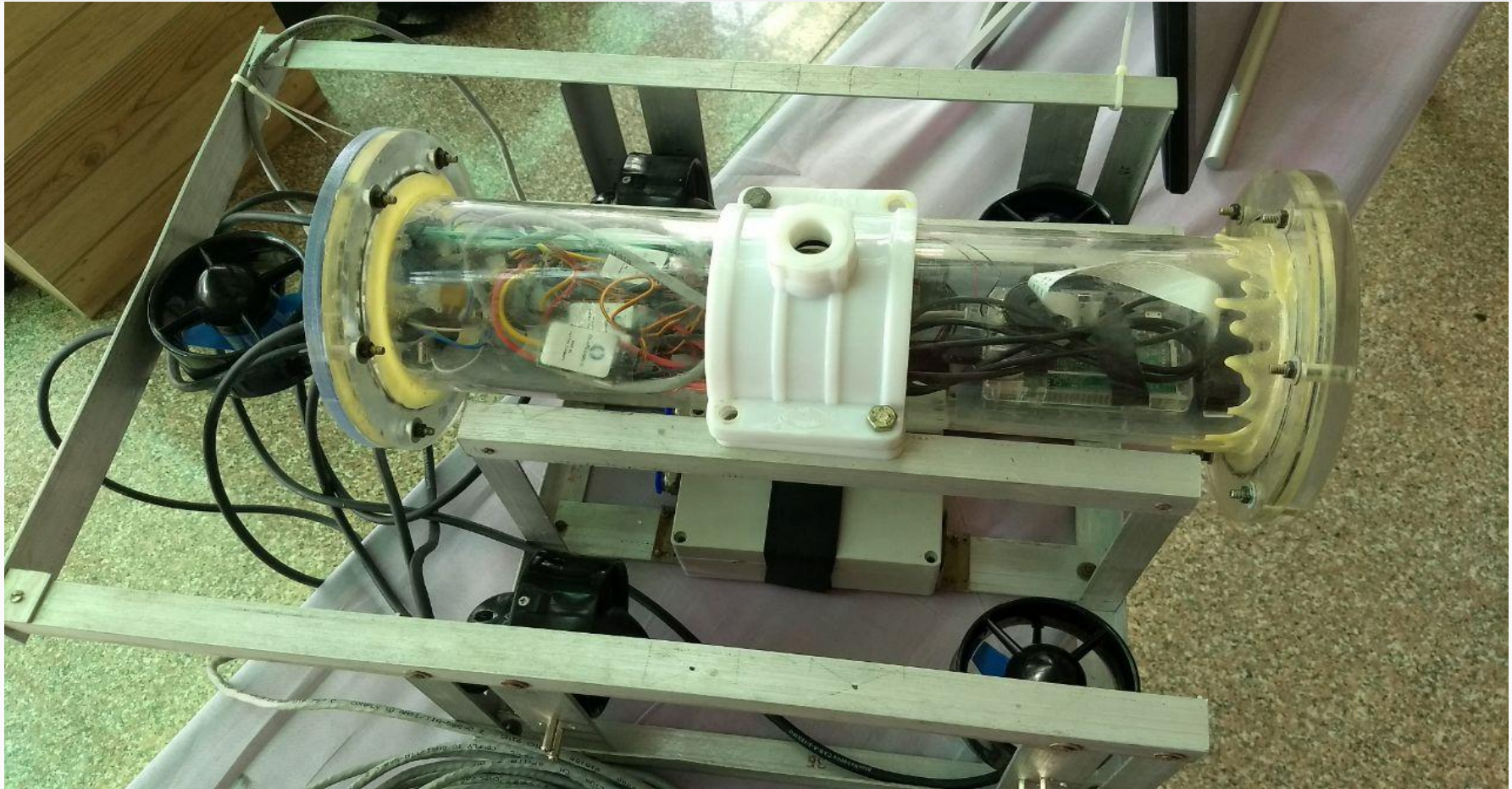




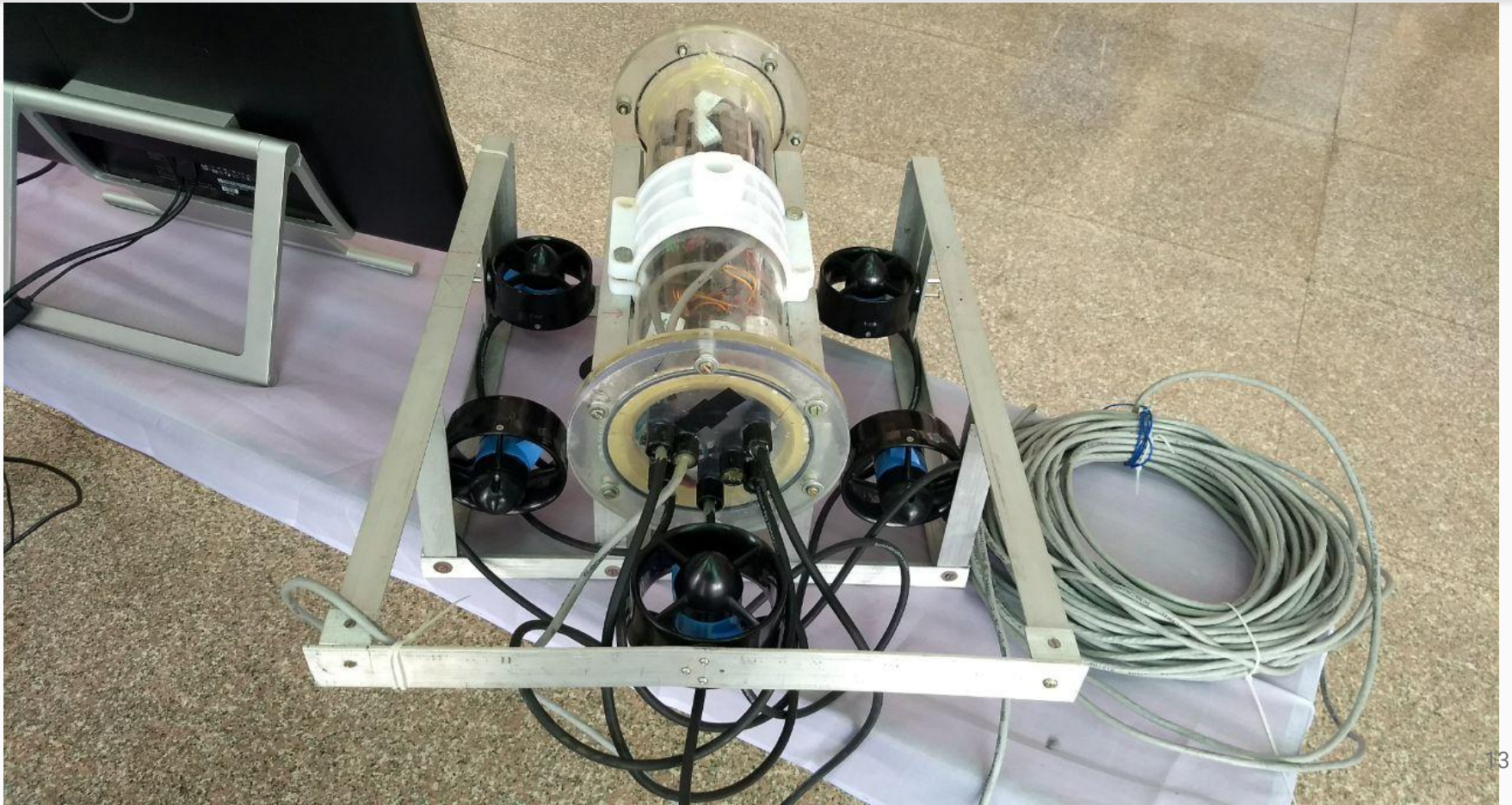
Top-View without the Electronics



Final Bot (Side View)

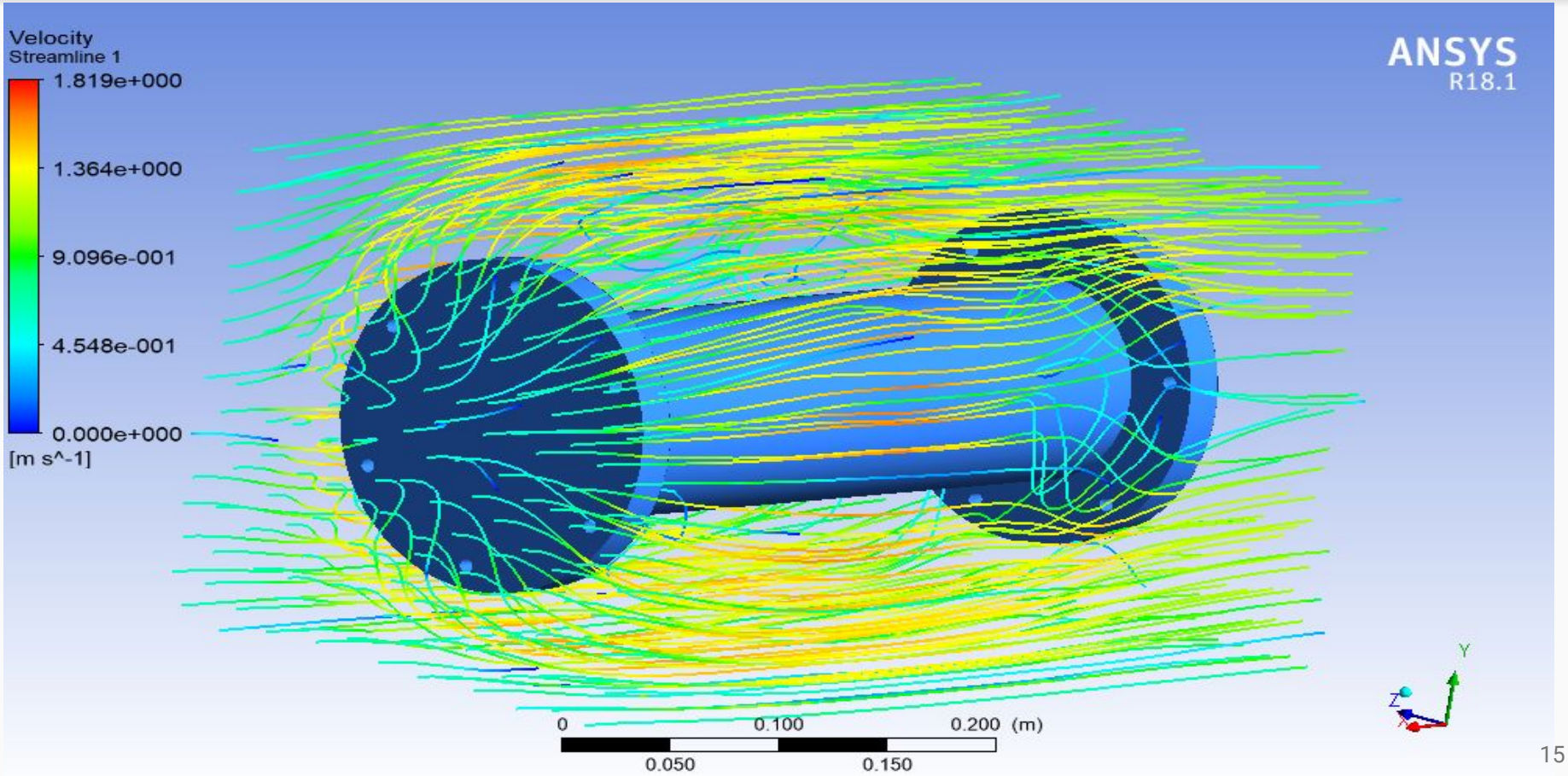


Final Bot (Back View)

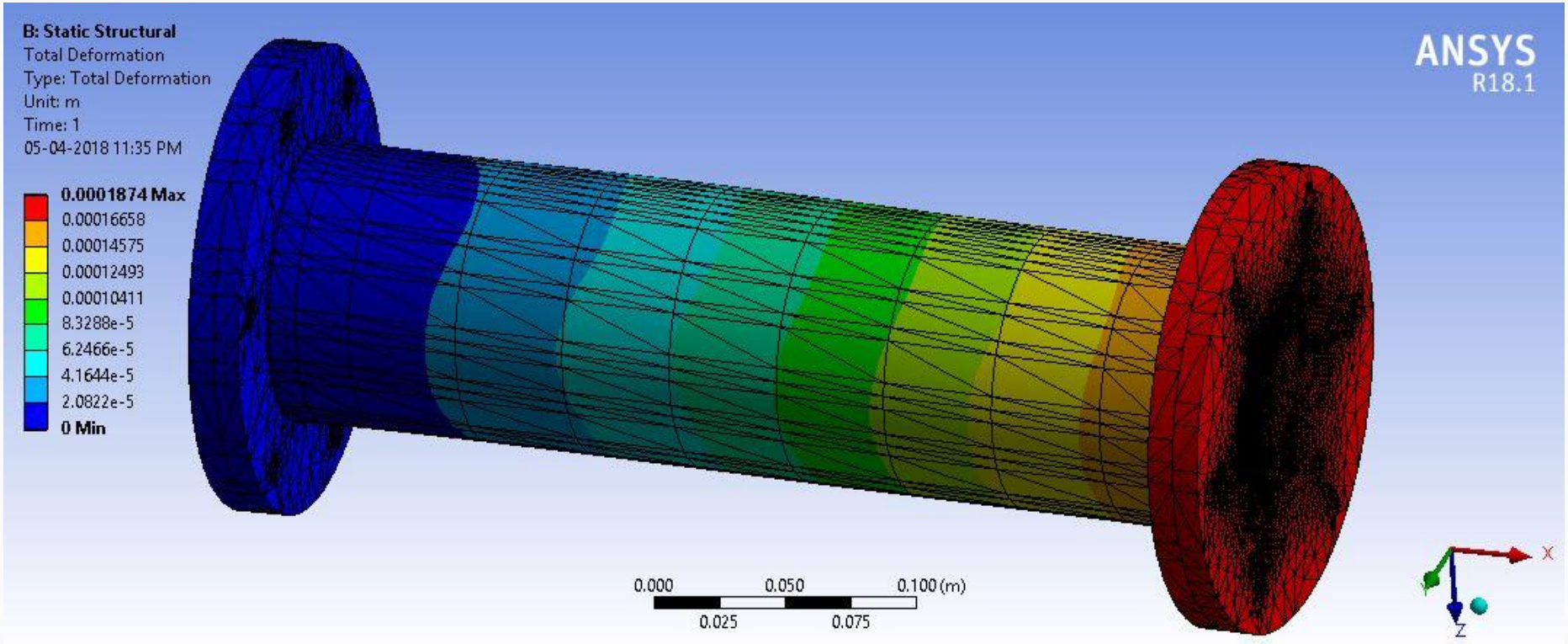


Simulations and Results

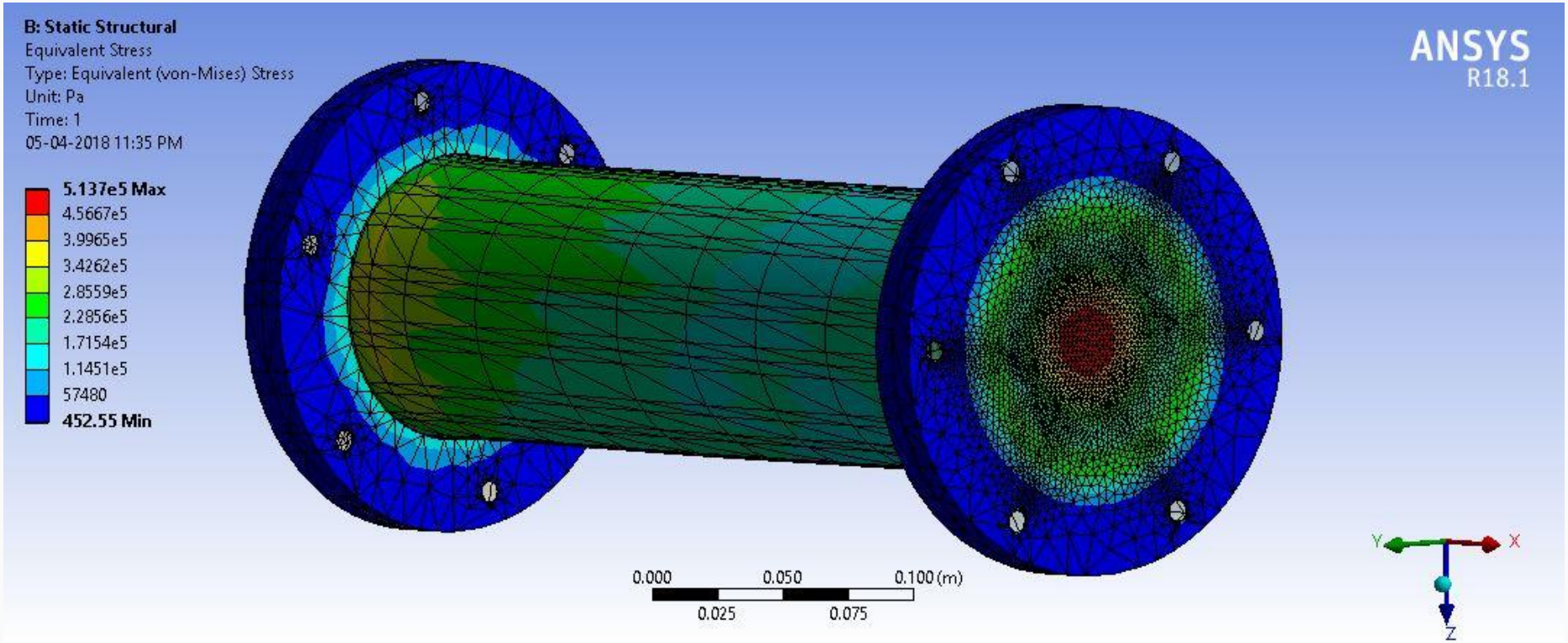
ANSYS (Fluent) Analysis



ANSYS (Structural) Analysis

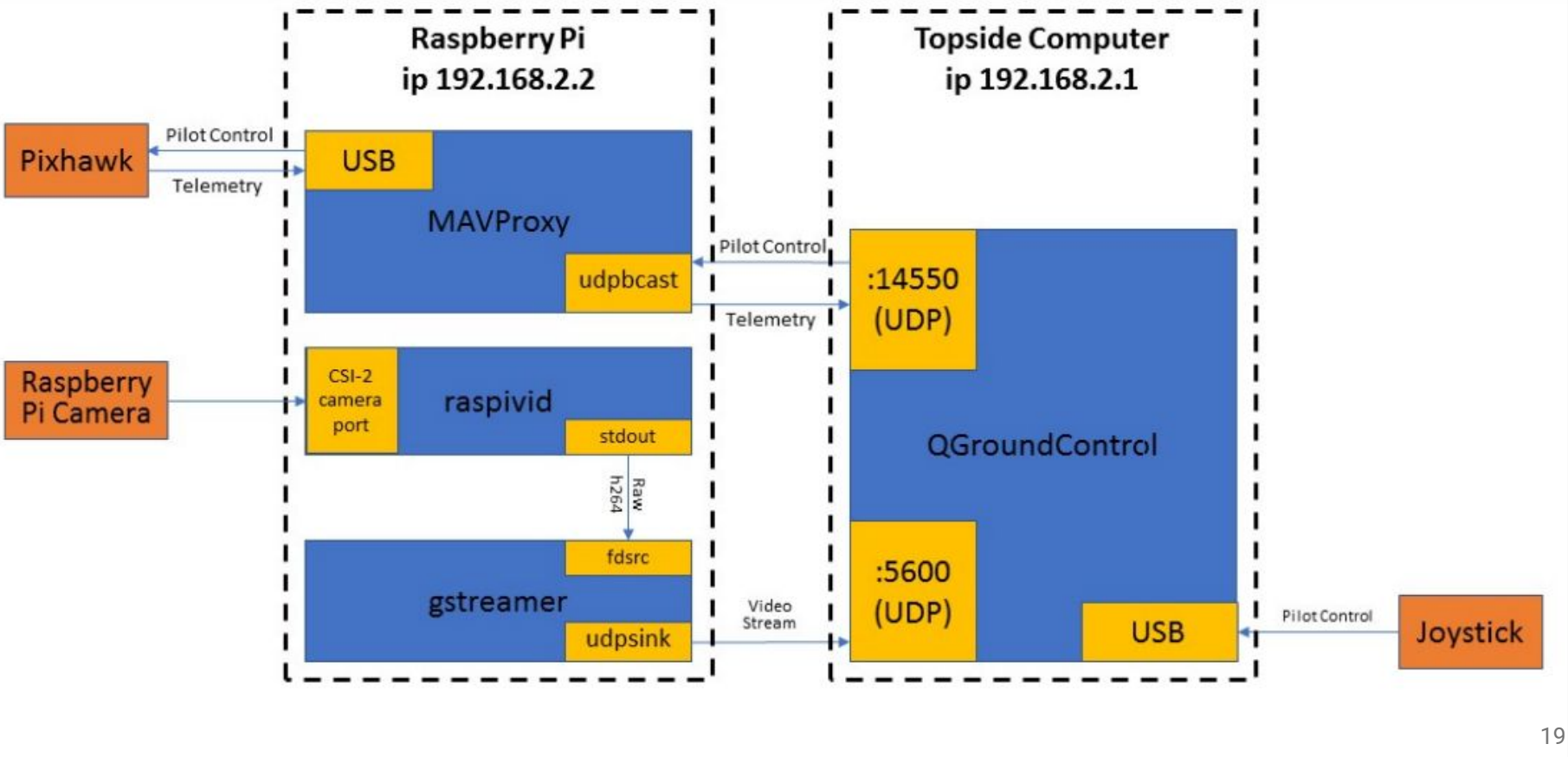


ANSYS (Structural) Analysis

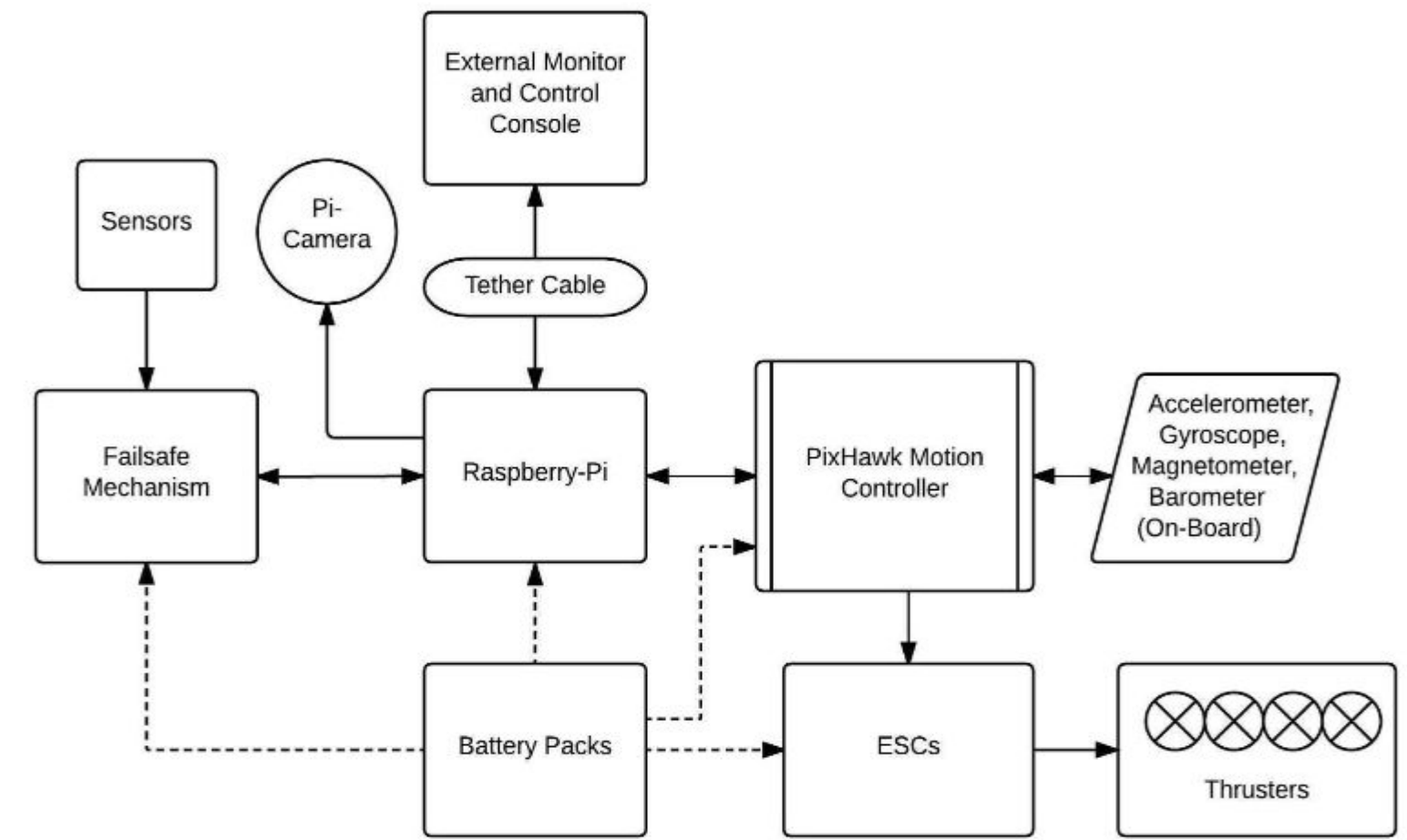


Electronics & Control System

Network Map Diagram



Block Diagram Of Electrical Components



Future Prospects

Future Prospects - Visualization and Mapping

- Recognize designated structures or targets and estimate their relative position.
- Relative pose computed by vision systems can be directly used to control the ROV.
- Recognizing and tracking of natural or specified objects.
- 3D mapping systems using sequences of images from mobile stereo cameras.
- Similar usage of SONAR to generate 3D point clouds.

Thank You...