



Turtlebot 3

MINI CURSO SAPCT

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PELO FUTURO DA INOVAÇÃO

Introduction

The main objective of this research is to propose an AUV model with small dimensions, capable of carrying missions on sea coastal and shallow waters with 50 meters deep. For this project, is expected:

1. A navigation system able to navigate in indoor and outdoor environments
2. Identify and avoid objects
3. Perform all activities with minimal intervention



Specific goals

The specific goals is divided into:



1. Conduct SOTA on topics related to the AUV concept;
2. Design the vehicle's external structure and perform CFD simulation;
3. Real time simulation using Gazebo and UUV Simulator [Manhães et al. 2016];
4. Write papers related to the project.

Main requirements

Customer

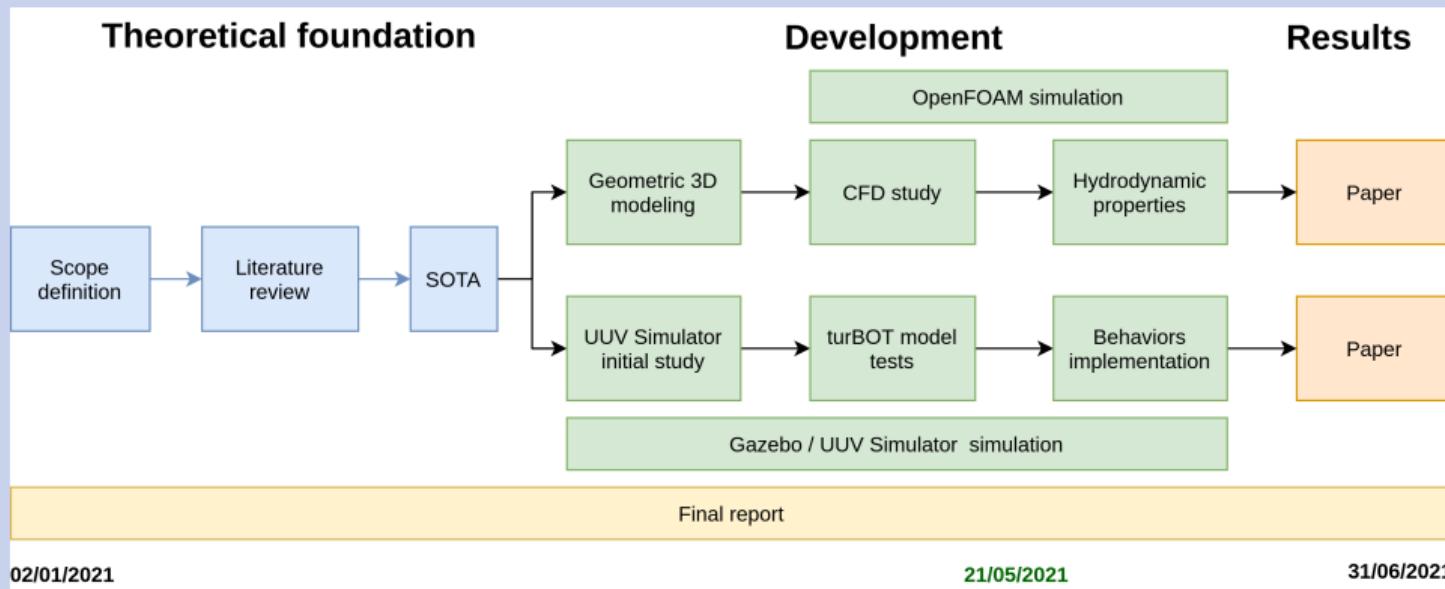
- Indoor/outdoor navigation
- Obstacle avoidance
- Autonomous navigation
- Small dimensions
- Energetic efficiency
- Emergency system
- Lighting system

System

- 5 DOF and 6 thrusters composition
- Perceive dynamic environments
- 50 depth operation
- 1.5 m/s max velocity
- Max 20 kg weight
- 2 h of battery autonomy
- Positive buoyancy

Methodology

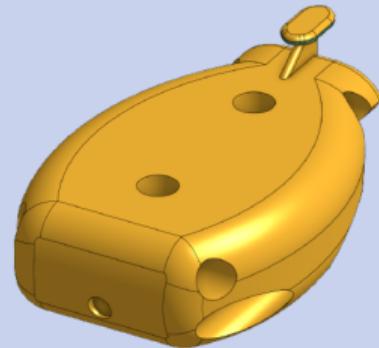
The methods adopted for the development of this project were divided into three parts: theoretical foundation, development, and results.



Vehicle's design

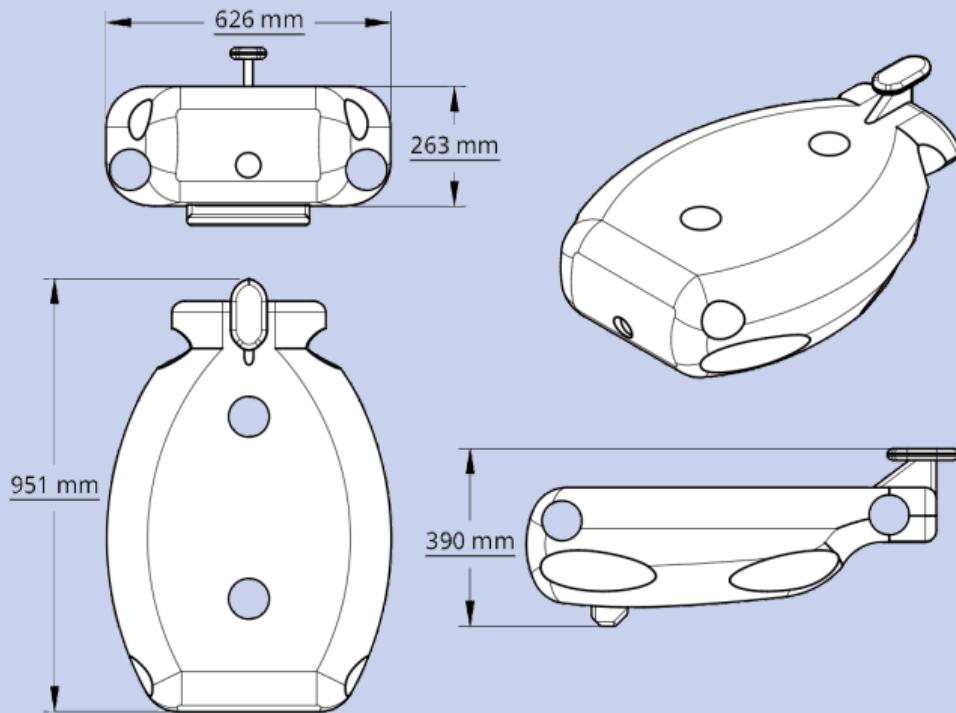


The first vehicle's design was made using OnShape software, based on real-life Turbot Fish.



After CFD analysis, an optimized design will be developed by the team.

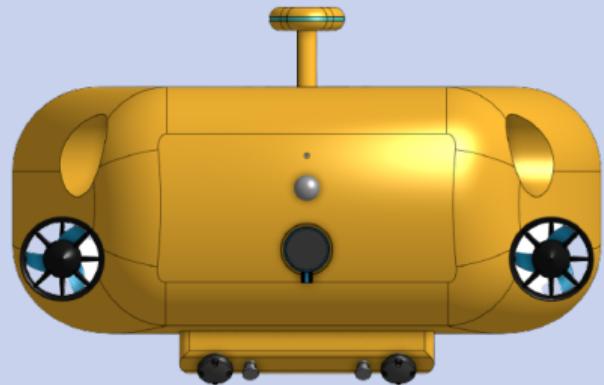
Vehicle's dimensions



Sensors and peripherals

Currently the turBOT project relies on these sensors, actuators and peripherals to perform the simulation:

1. Low-light HD USB camera
2. Minteye standard stereo camera
3. Ping sonar altimeter and echosounder
4. Red laser diode module
5. MPU6050 IMU
6. Venus638Flpx GPS
7. Lumen Subsea Light
8. Thruster Bluerobotics T200



Gazebo simulation



References (1)

[Manhães et al. 2016] Manhães, M. M. M. et al. Uuv simulator: A gazebo-based package for underwater intervention and multi-robot simulation. In: **OCEANS 2016 MTS/IEEE Monterey**. [S.l.: s.n.], 2016. p. 1–8.



Questions?

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