itu auv team.

Master Catalog
2025

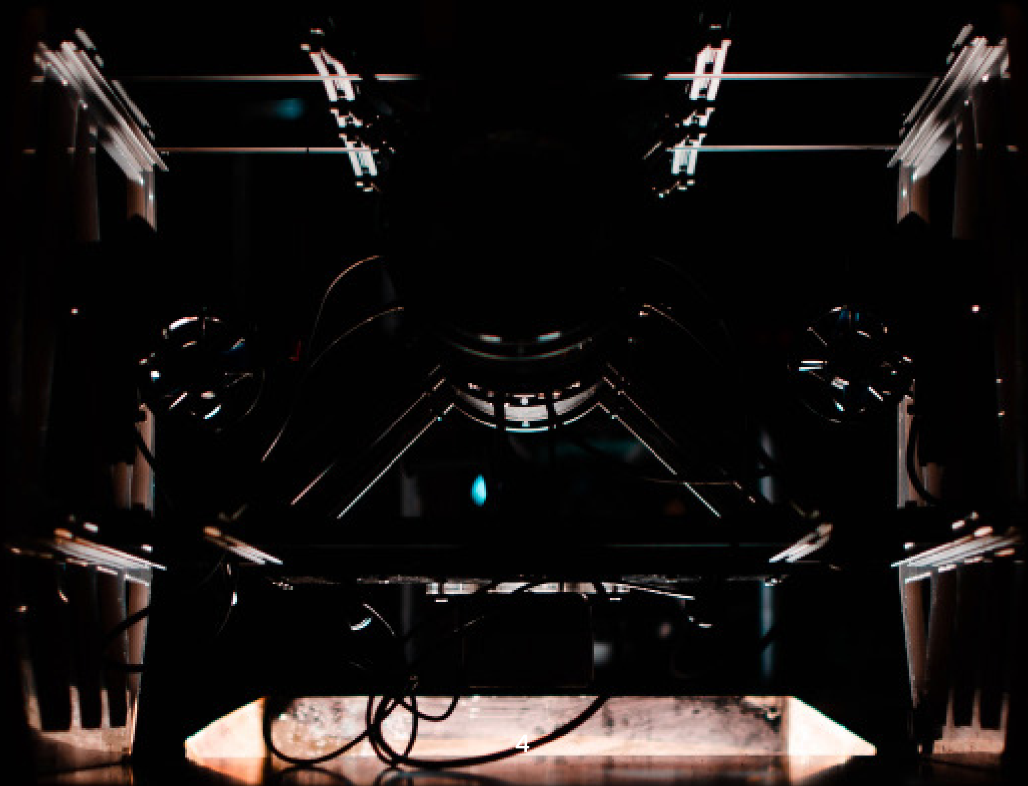
İTÜ

presents.

index.

autonomous underwater vehicle.

An AUV is an autonomous underwater robot that uses various onboard sensors to perceive environmental conditions, makes appropriate decisions based on a predefined mission flow, moves accordingly, captures images, processes them, performs object recognition, and interacts with surrounding objects using its manipulators.



we.

The ITU AUV Team was founded in 2018 within Istanbul Technical University by our founding members who wanted to combine their two years of underwater robotics experience with autonomous technologies. As one of the few teams representing our country in international AUV competitions such as RoboSub, SAUVC, and RAMI, as well as domestic events like Teknofest, the team continues its work in this field.

team diagram.

Mechanic

Responsible for the complete physical design of the vehicle, the simulation of the designed parts, and their manufacturing.

Kreatif

Prepares and designs the necessary digital presentations, catalogs, and brochures, both visual and physical elements, for promoting the team.

Organization

Manages the overall administration of sponsorships, media, finance, and the team's strategies.

Software

Responsible for developing the relevant software modules for the execution flow of the tasks on the vehicle.

Electronics

Designs and develops the electronic components that handle communication between all sensors on the vehicle and meet the power requirements of the propulsion system.

Team Captain

İsmail Furkan Mutlu

Technical Mentors

Sencer Yazıcı

Batuhan Özer

Emre Orkun Kayran

Selen Cansun Kırgöz

Academic Mentor

Assoc. Prof. Bilge Tutak

turkuaz.

Developed between 2018 and 2022, won a world championship.

#SAUVC2022

CHAMPION

#RoboSub2021

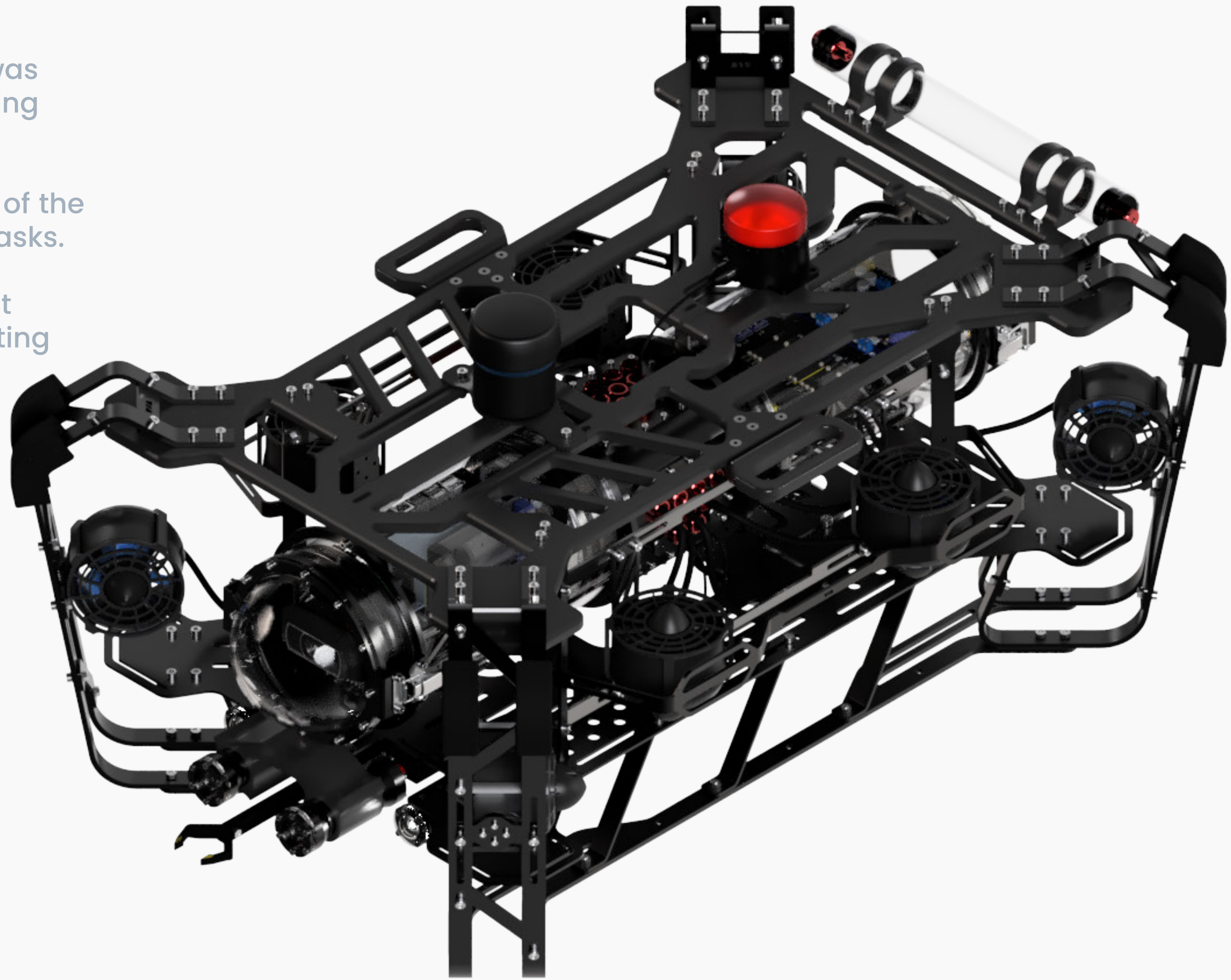
FINALIST

taluy.

Taluy, whose design began in 2022 and production was completed in 2023, was designed for use in challenging environments.

In 2023, it was awarded 2nd place at the 10th edition of the RAMI Competition in Italy, known for its demanding tasks.

In 2024, at the 27th RoboSub competition in the U.S., it received the “Best Task Execution” award for completing two tasks simultaneously.

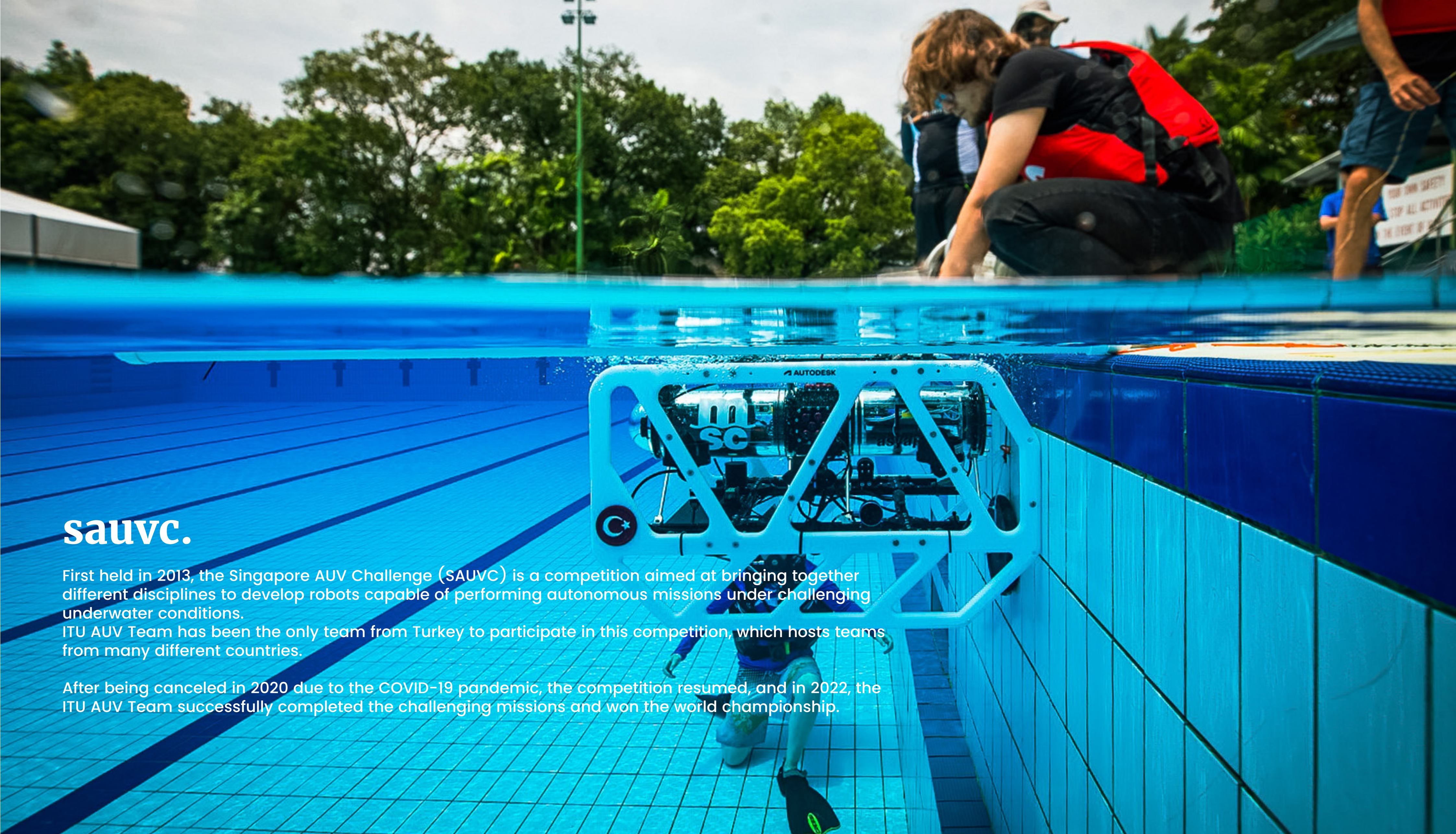


#RoboSub**2024**

BEST MISSION AWARD

#RAMI**2023**

2nd



sauvc.

First held in 2013, the Singapore AUV Challenge (SAUVC) is a competition aimed at bringing together different disciplines to develop robots capable of performing autonomous missions under challenging underwater conditions.
ITU AUV Team has been the only team from Turkey to participate in this competition, which hosts teams from many different countries.

After being canceled in 2020 due to the COVID-19 pandemic, the competition resumed, and in 2022, the ITU AUV Team successfully completed the challenging missions and won the world championship.

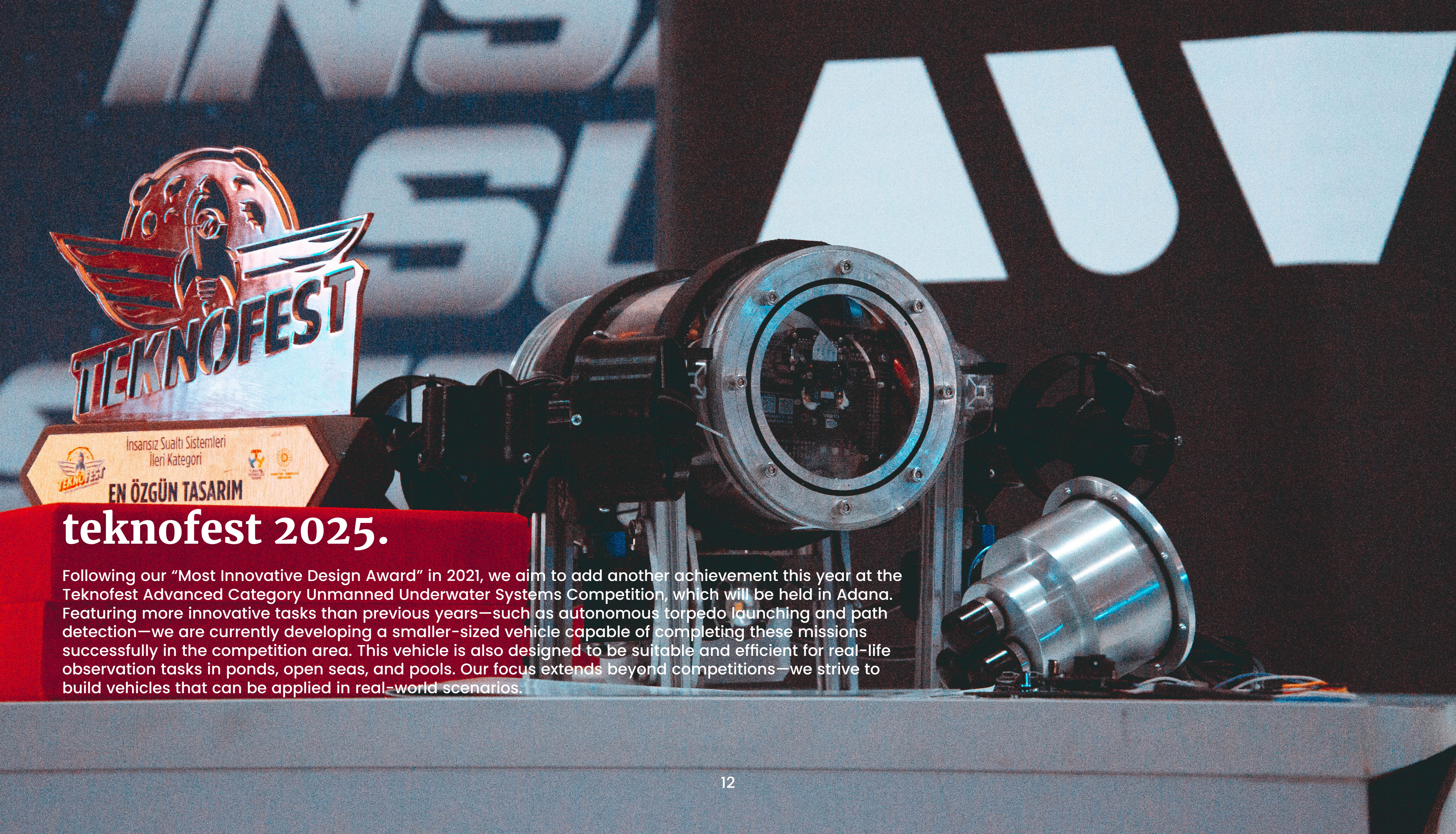
robosub.

At RoboSub 2024, where 42 teams from 7 different countries competed, the ITU AUV Team was the only team representing Turkey. With their autonomous underwater vehicle Taluy, they won first place in the Technical Presentation category, third place in Technical Documentation, and were the only team to complete two tasks simultaneously—earning the **Best Mission Performance** award.

rami competition.

Held for the first time in 2022 in La Spezia, Italy, the RAMI Competition is a fully autonomous underwater robotics contest featuring tasks that are difficult to perform even by human operators. The event takes place in an open-sea environment, where vehicles are expected to handle challenging missions such as variable depths, currents, murky water, and autonomously detecting and repairing a leaking pipe.

Competing mostly against postgraduate-level teams from European countries, the ITU AUV Team participated in 2023, finished in 2nd place, and was awarded the **Best Technical Presentation** prize.



teknofest 2025.

Following our “Most Innovative Design Award” in 2021, we aim to add another achievement this year at the Teknofest Advanced Category Unmanned Underwater Systems Competition, which will be held in Adana. Featuring more innovative tasks than previous years—such as autonomous torpedo launching and path detection—we are currently developing a smaller-sized vehicle capable of completing these missions successfully in the competition area. This vehicle is also designed to be suitable and efficient for real-life observation tasks in ponds, open seas, and pools. Our focus extends beyond competitions—we strive to build vehicles that can be applied in real-world scenarios.

mechanic.

Taner Özpınar

Bartu Bekci

Hivşa Delal Şahin

İlbey Fatih Şahin

Mehmet Salih Akbulut

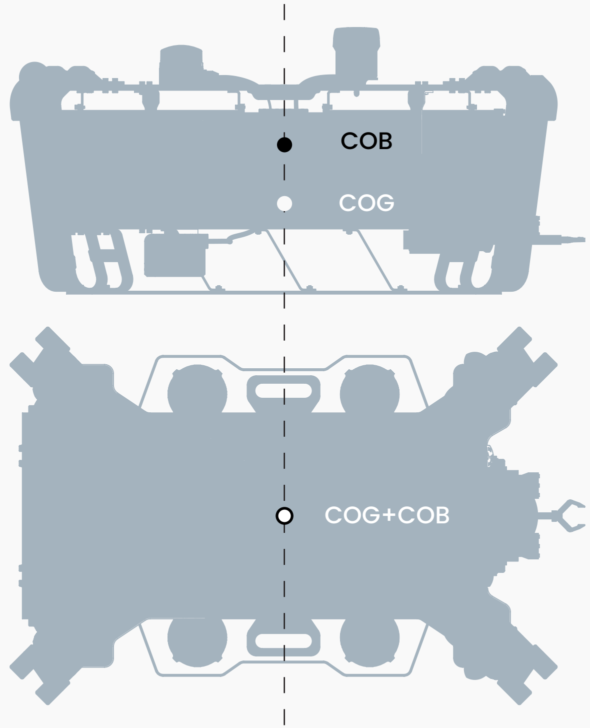
Weight
26 Kg

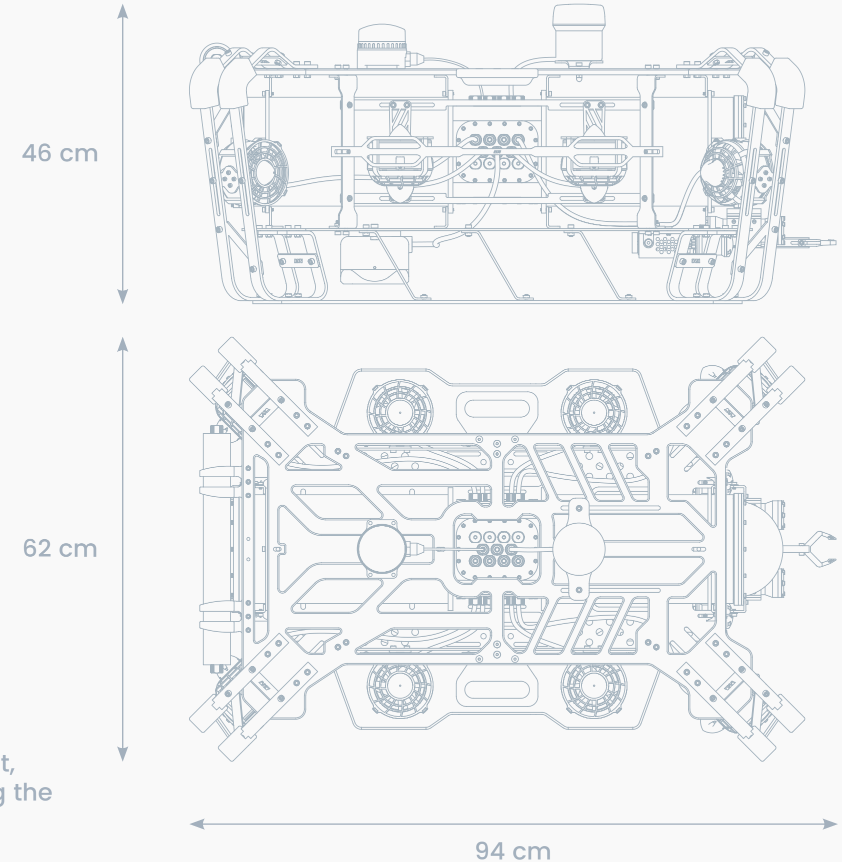
Maximum Speed
4 Kn

Allowable Depth
300 m

Payload
100 N

Mission Duration
4 Saat

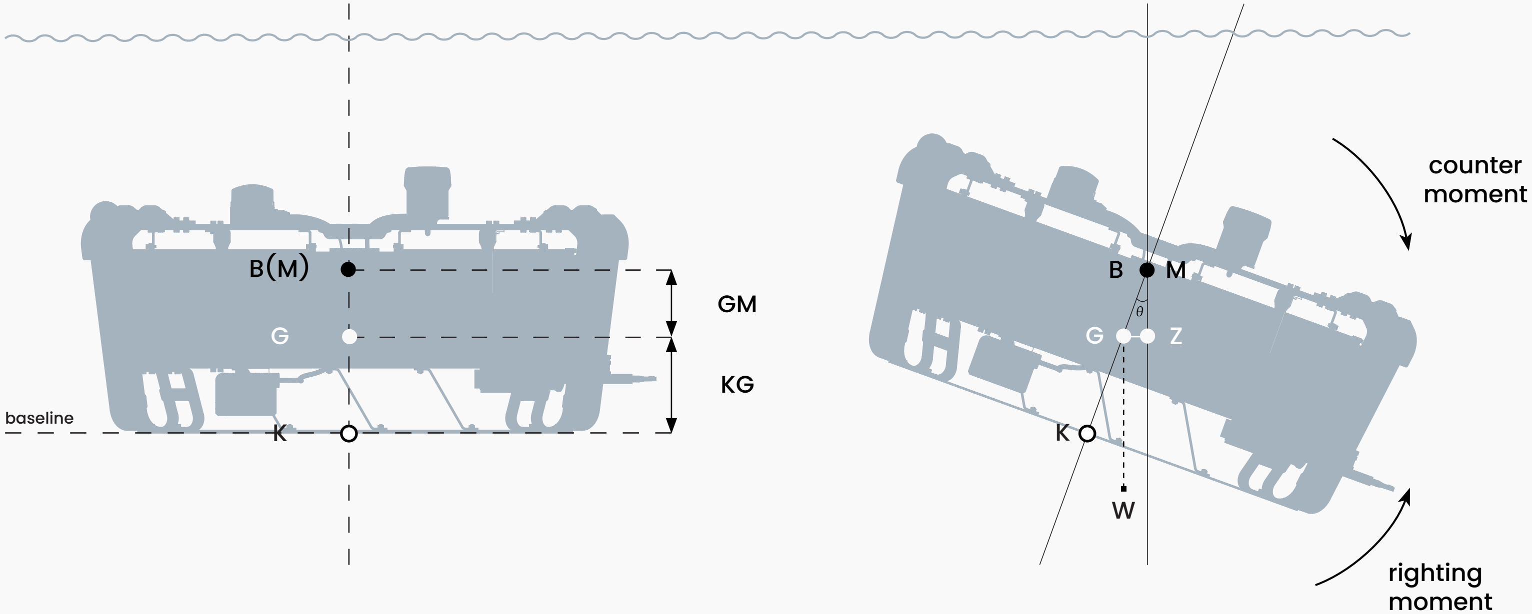




design.

Structurally, our vehicle consists of three main components: the chassis, the electronics housing unit, and mission-specific equipment. The positions of these components are determined by considering the distribution of buoyancy and center of gravity.

To ensure the vehicle remains level while stationary, the Vertical Center of Gravity (VCG) and Vertical Center of Buoyancy (VCB) are aligned to prevent pitch, and the Longitudinal Center of Gravity (LCG) and Longitudinal Center of Buoyancy (LCB) are aligned to avoid trim. This configuration allows the vehicle to remain stable when at rest. During the design and modification phases, the positions of the VCG, VCB, LCG, and LCB are continuously calculated using a MATLAB script, enabling the vehicle's stability to be monitored mathematically.



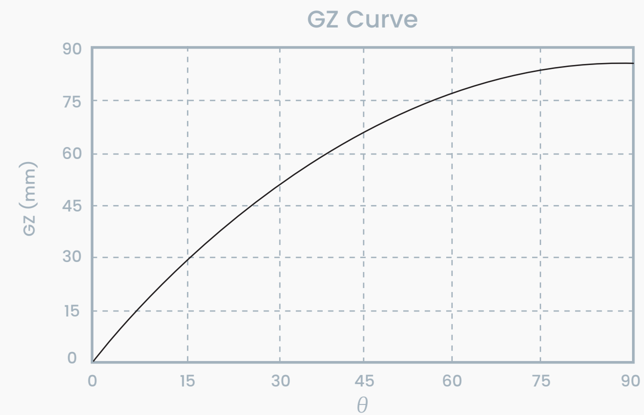
KM	288.5 mm
GM	84.6 mm
KB	288.5 mm
KG	203.9 mm

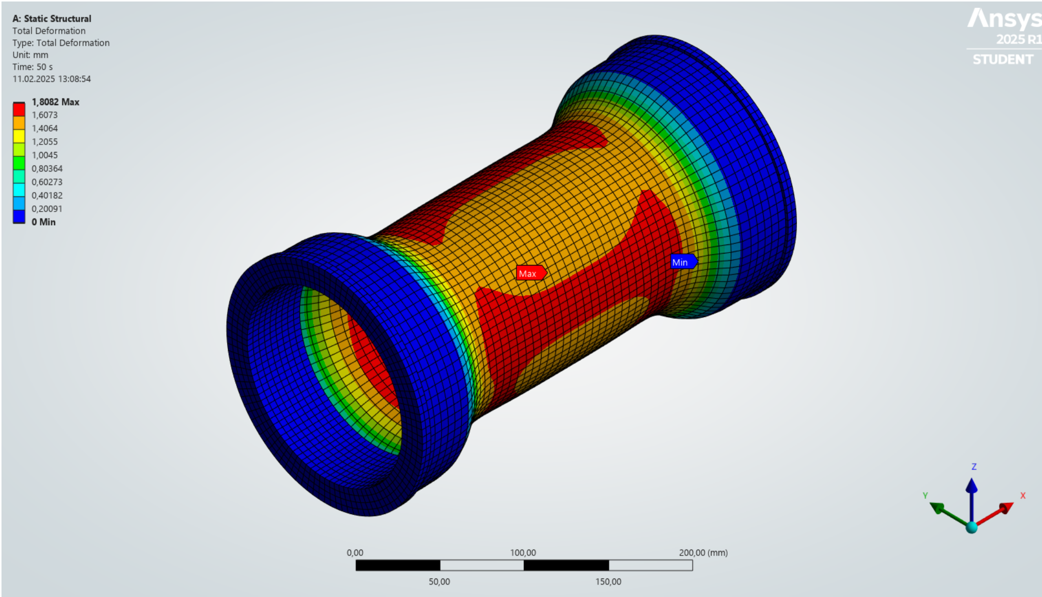
dynamic stability.

Dynamic stability is a key design factor for autonomous underwater vehicles. The stability analysis of Taluy was conducted by examining the GZ curve. The area under this curve represents the vehicle's ability to return to a stable position. Since the volume remains constant, the metacentric point (M) coincides with point B. Undesired forces encountered underwater are counteracted by the vehicle's own righting moment. Dynamic stability is calculated by multiplying the area under the GZ curve within a specific angle range by the vehicle's weight.

$$\mathbf{DS} = W \int_0^{\theta} GZ \, d\theta$$

These evaluations are crucial for assessing stability, with analyses showing a high righting moment at critical angles.





$P = \rho g h$ P = (1000) × (9.81) × (300) = 2.943 MPa, hydrostatic pressure.

To prevent structural failures, the tube must be thick enough to withstand external pressure. For thick-walled cylinders under external pressure, we use the **Bresse Equation**:

$$t = \frac{PD}{2\sigma_{allowable}} \qquad t_{min} = \frac{(2.943) \times (160)}{2 \times 50}$$

The minimum required thickness to prevent yielding is 4.71 mm. The current design uses t = 8 mm, which initially appears sufficient.

However, the Finite Element Analysis (FEA) results showed a Von Mises equivalent stress of 115 MPa, which exceeds the yield strength of PMMA (50 MPa).

To address this issue, we determined the required thickness using a reverse engineering

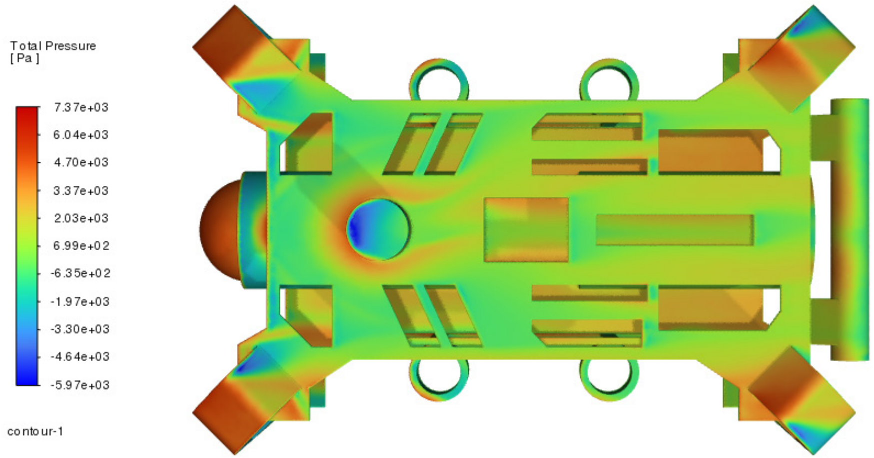
$$t_{req} = \frac{\sigma_{vonMises}}{\sigma_{yield}} \times t_{current} \qquad t_{req} = \frac{115.246}{50} \times 8 = 18.4\text{mm}$$

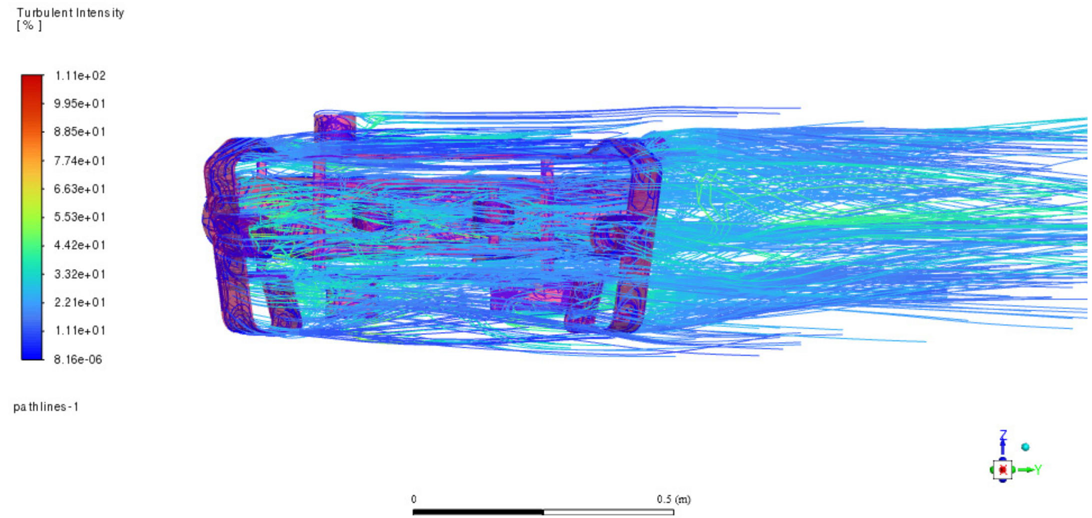
The current tube is insufficient for 300 meters. To ensure structural integrity, a minimum thickness of 18.4 mm is required. Therefore, using an aluminum tube is recommended for depths exceeding 100 meters.

structural strength.

In Taluy, the underwater tube made of PMMA—chosen for its transparency and lightness—was designed to withstand 2.943 MPa hydrostatic pressure at 30 meters depth. Initial calculations suggested a minimum wall thickness of 4.71 mm, and the existing 8 mm seemed sufficient. However, FEA showed a Von Mises stress of 115.26 MPa, exceeding PMMA's yield strength (30–50 MPa). Thus, a safer thickness of 18–20 mm was recommended. The analysis was performed using ANSYS Mechanical with MultiZone meshing, realistic boundary conditions, and support flanges.

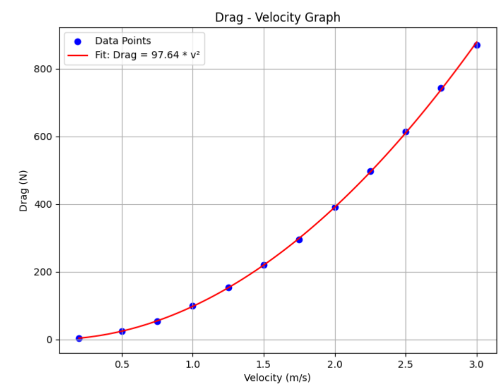
Considering the safety factor, a 4 mm Aluminum 5083 tube is suggested for depths beyond 100 meters. Alternatively, stronger materials like polycarbonate or PEEK may also be used.

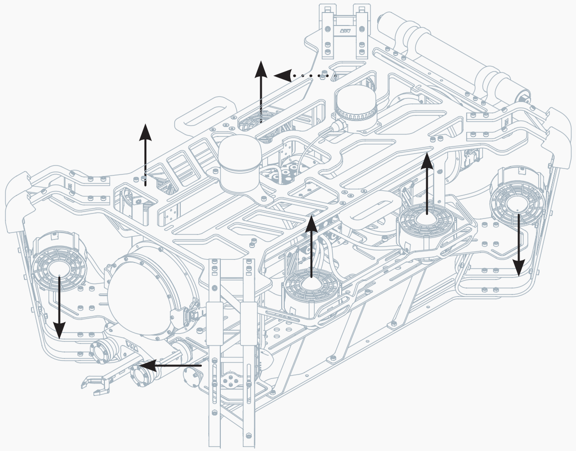




hydrodynamics.

This study covers a CFD analysis conducted in ANSYS Fluent using the k-ω SST turbulence model to evaluate the hydrodynamic performance of the underwater vehicle. Water was modeled under steady flow conditions with constant density and viscosity, while boundary layer effects near the vehicle surface and wake region flow structures were accurately captured using the polyhex mesh method, a combination of polyhedral and hexahedral cells. A mesh independence study ensured simulation accuracy. Simulations were performed across a velocity range of 0.25 m/s to 3.0 m/s, and the drag forces were found to follow a quadratic trend through curve fitting. Additionally, pressure distribution, turbulence intensity, and Q-criterion visualizations were analyzed to detail the vehicle's flow characteristics and their impact on drag, providing valuable data for power requirements and propulsion system optimization.





mass
added mass
damping
external forces

General Movement Eqn: $\mathbf{M}\dot{\nu} + \mathbf{C}(\nu)\nu + \mathbf{D}(\nu)\nu + \mathbf{g}(\eta) = \boldsymbol{\tau}$

$$\boldsymbol{\nu} = \begin{bmatrix} u \\ v \\ w \\ p \\ q \\ r \end{bmatrix} \qquad \boldsymbol{\eta} = \begin{bmatrix} x \\ y \\ z \\ \phi \\ \theta \\ \psi \end{bmatrix} \qquad \boldsymbol{\tau} = \begin{bmatrix} F_x \\ F_y \\ F_z \\ M_x \\ M_y \\ M_z \end{bmatrix} = \mathbf{B} \cdot \boldsymbol{T} \qquad \mathbf{B} = \begin{bmatrix} b_{11} & b_{12} & b_{13} & b_{14} & b_{15} & b_{16} & b_{17} & b_{18} \\ b_{21} & b_{22} & b_{23} & b_{24} & b_{25} & b_{26} & b_{27} & b_{28} \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ b_{61} & b_{62} & b_{63} & b_{64} & b_{65} & b_{66} & b_{67} & b_{68} \end{bmatrix}$$

body-axis velocity matrix

position and orientation matrix

thruster matris

allocation matrix

Damping and hydrodynamic viscous effects: $\mathbf{D}(\nu) = -\mathbf{D}_1\boldsymbol{\nu} - \mathbf{D}_2$

Thruster Force: $T_i = K_t V_i$

b_{ij}: represents the force/moment contribution of each thruster along the respective axes.

maneuverability.

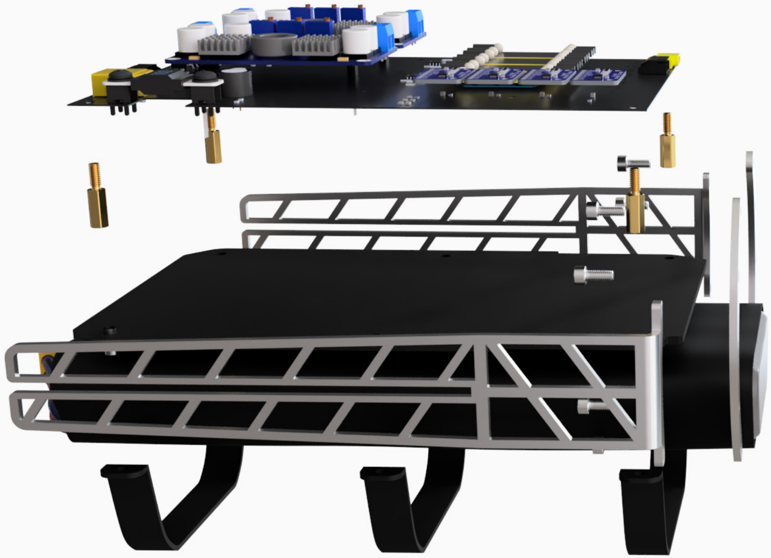
The motion of an autonomous underwater vehicle with six degrees of freedom is defined by the Newton-Euler equations. These equations account for the vehicle's mass, added mass effects, hydrodynamic forces, damping, and environmental influences. The motion is modeled using an allocation matrix that represents the distribution of forces from the thrusters on the vehicle's body.

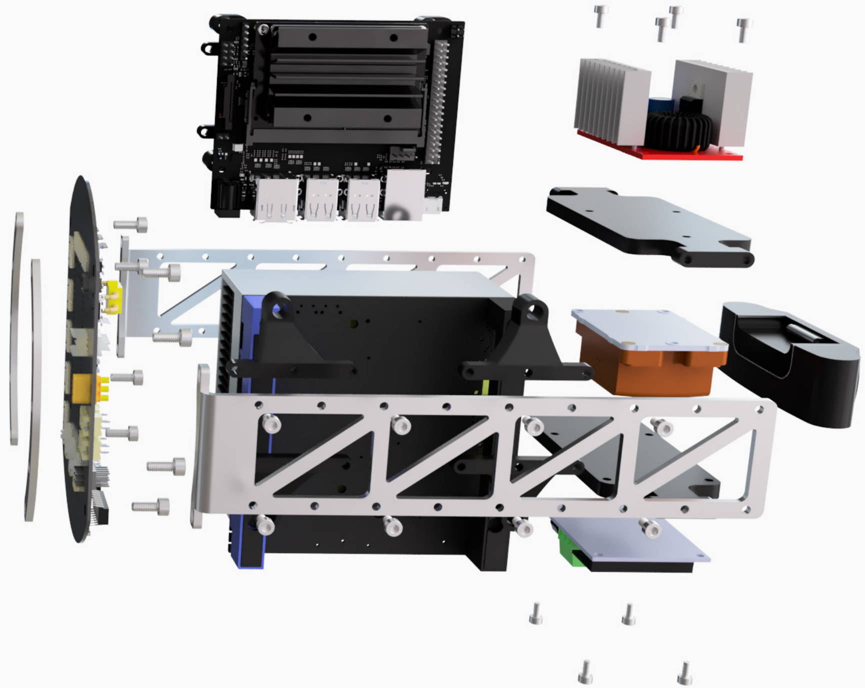
Using 8 thrusters (4 for Z-axis, 4 for X-Y axes), both linear and angular velocities are controlled. This formulation enables precise control of the vehicle's linear (surge, sway, heave) and angular (roll, yaw, pitch) motions.

penetrator.

To ensure waterproofing of electronic components underwater, BlueRobotics WetLink penetrators were used. These penetrators provide watertight sealing without the need for epoxy.

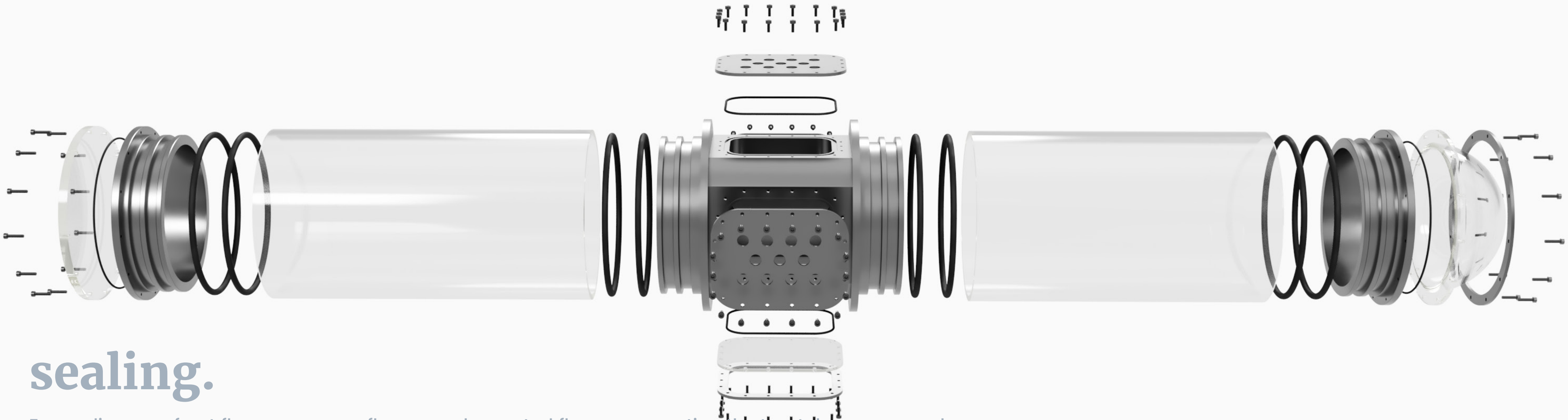
Consisting of five separate parts, the penetrator prevents water from reaching the electronics at depths up to 950 meters, thanks to its built-in silicone gasket and O-ring when a cable is passed through it.





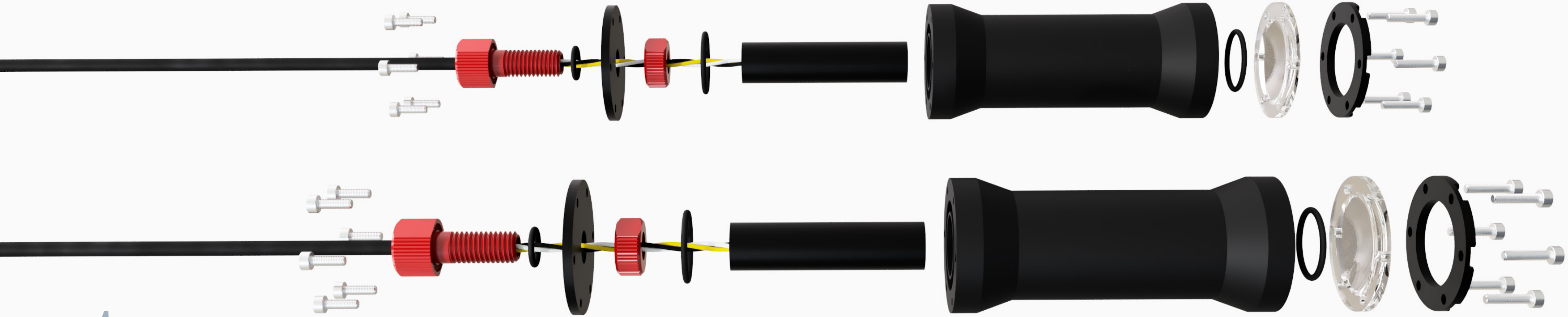
enclosure.

This section houses the vehicle's motor controllers, cameras for image processing, battery, electronic components, and all parts that must remain isolated from water. It consists of two cylindrical PMMA tubes, an Aluminum 6061 central flange between them, PMMA front and rear caps, and Aluminum 6061 front and rear flanges. Cylindrical tubes were chosen because circular cross-sections distribute underwater pressure most effectively. PMMA (acrylic) was selected as the tube material due to its pressure resistance at operational depths, its transparency allowing visual inspection of electronics during development, and its cost-effectiveness.



sealing.

For sealing, one front flange, one rear flange, and a central flange connecting the two tubes were used. These flanges ensure both mechanical connection and watertight sealing between the cylinders and the front/rear caps. Each flange contains O-ring grooves designed to hold circular cross-section seals (O-rings). To ensure standard-compliant manufacturing, the groove dimensions were determined using Trelleborg's seal design tool. Design parameters considered included groove fill, compression ratio, and stretch allowance of the seals. The front cap was manufactured as a hemispherical dome to take advantage of light refraction underwater, providing a wider field of view. The central flange features four rectangular cutouts, and the caps on these openings include 11 penetrator holes. Cables from external components that must be in contact with water are routed through these penetrators and connected to internal electronic boards inside the sealed tube.

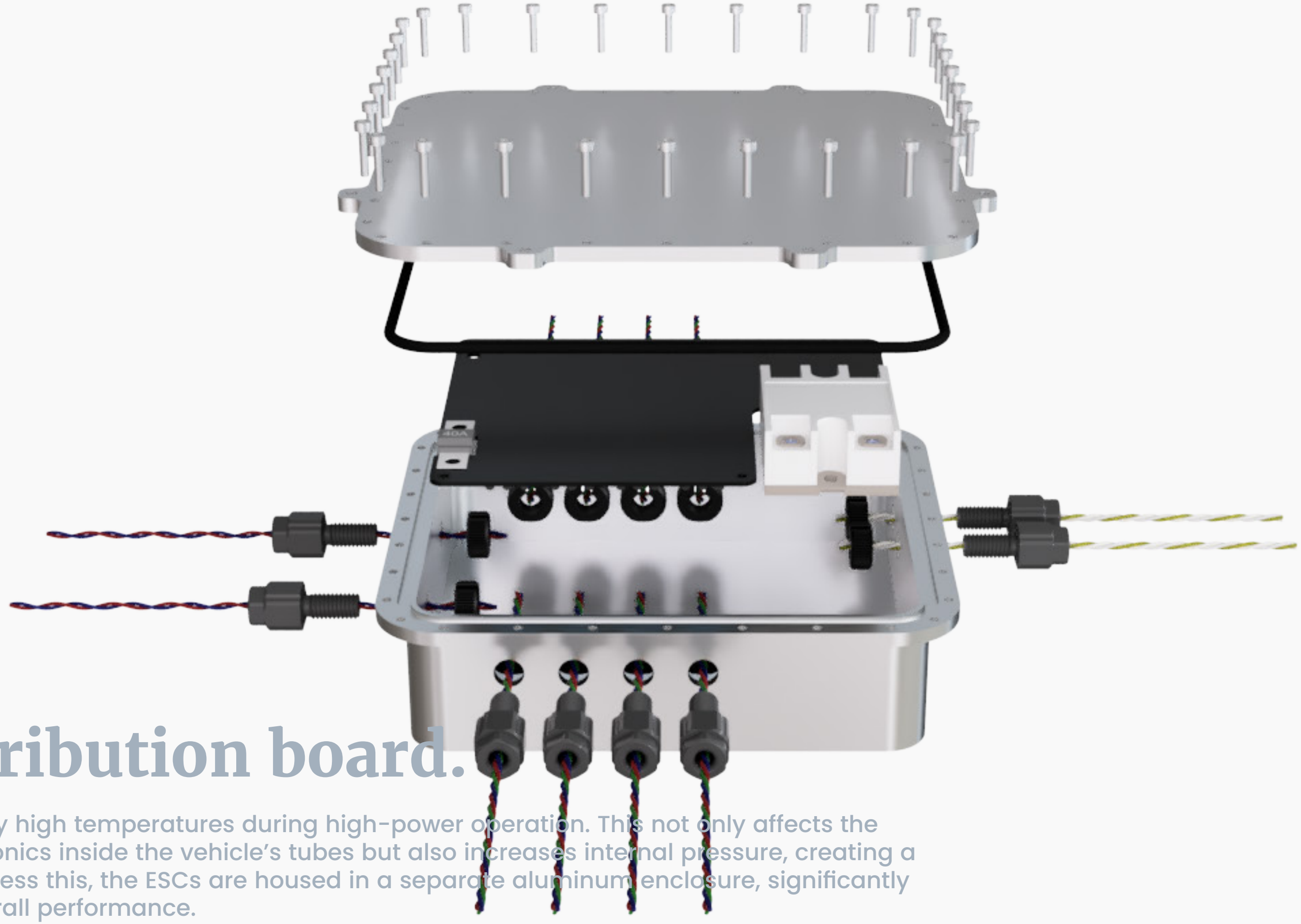


stereo camera.

A single camera is insufficient for estimating object depth underwater. Therefore, our software and mechanical teams developed a camera unit that mimics human vision. This unit can perceive how far objects are from the vehicle using perspective.

The “bullet” cameras housed within the enclosures feature a 2.8 mm focal length and a 155-degree field of view, making object detection easier.

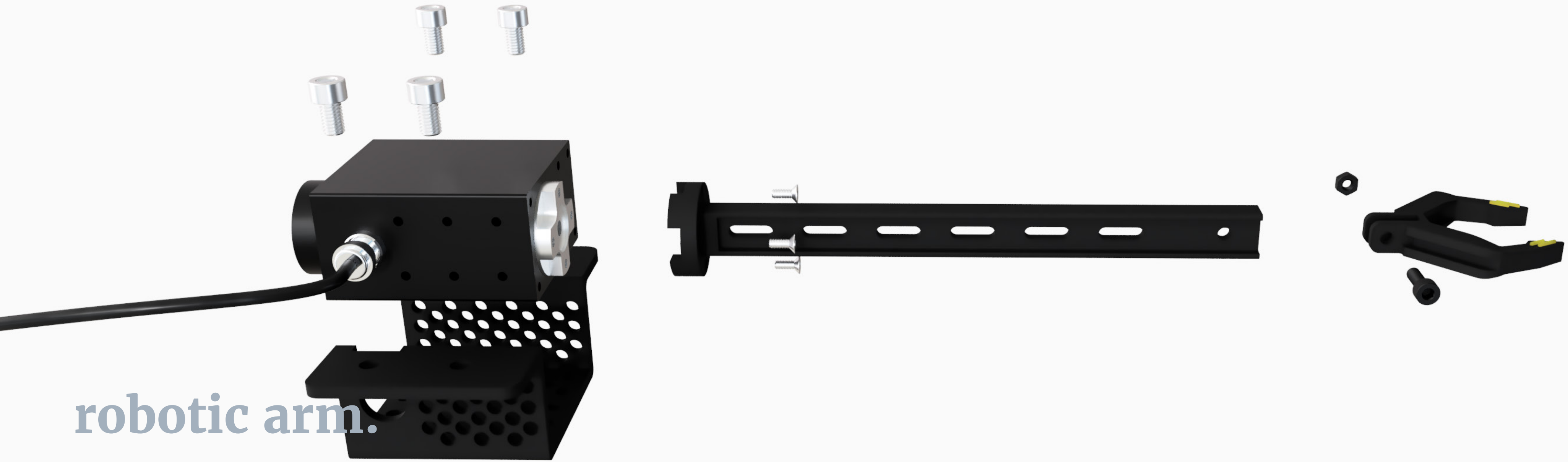
To withstand hydrostatic pressure at deeper depths and enhance heat dissipation underwater, the mechanical team selected Aluminum 6061 for the camera housings.



power distribution board.

Thruster ESCs can reach very high temperatures during high-power operation. This not only affects the performance of other electronics inside the vehicle's tubes but also increases internal pressure, creating a potential safety risk. To address this, the ESCs are housed in a separate aluminum enclosure, significantly enhancing the vehicle's overall performance.

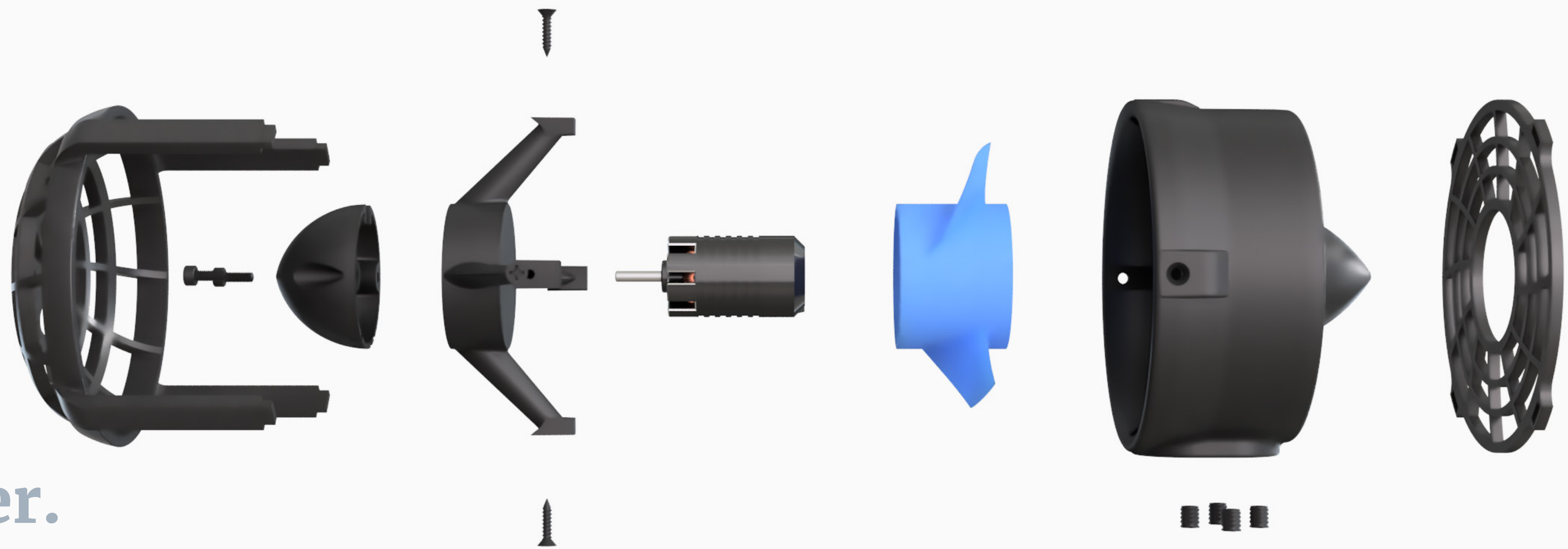
This enclosure was custom-designed to fit the PCB developed by the electronics team and manufactured using 3-axis CNC machining. All thrusters are connected through this single housing, receiving power directly from the vehicle's battery. The heat generated inside is transferred to the surrounding water using thermal pads.



robotic arm.

The gripper design prioritizes simplicity and functionality. The mechanism operates using a single servo motor, which is mounted with four bolts onto an aluminum plate beneath the vehicle using a 3D-printed bracket.

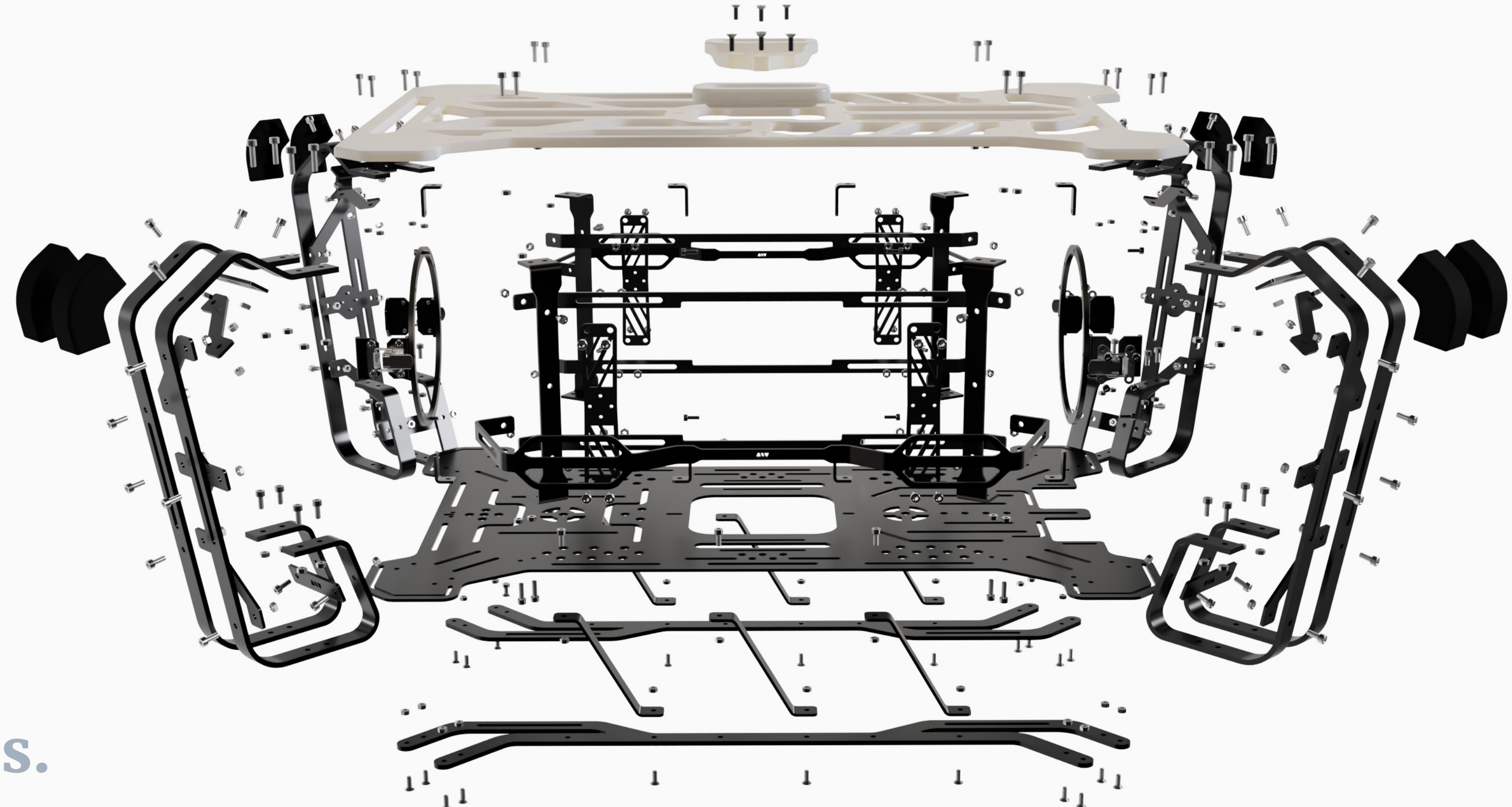
The part connected to the motor's rotor is designed based on the "I-beam" theory, allowing the motor to operate smoothly under torques up to 3.5 N·cm. The gripping arm at the end is designed to perform roll motion and can be replaced depending on the operational environment. Designed and simulated by the mechanical team, the mechanism functions reliably at depths of up to 150 meters.



thruster.

Our vehicle uses eight Blue Robotics T200 brushless DC thrusters. These motors are positioned to provide movement in all six degrees of freedom: 4 on the Z-axis, 2 on the X-axis, and 2 on the Y-axis.

They were chosen for their high thrust output and efficiency underwater. Analyses showed that the selected motor model and configuration provide sufficient speed and maneuverability for the vehicle. The thruster placement was carefully designed to support smooth and effective autonomous movement.



chassis.

Resisting forces both on land and underwater is critical for the robot to perform its tasks effectively. To balance the internal volume of the tubes, the vehicle's total weight is calculated with precision. The vehicle's structure is divided into three main sections: corner frame systems, top and bottom plates, and side frame systems. Each of the four corners is made from 5 mm thick Aluminum 6061 sheets, shaped using press brake bending. The corner frames include slotted channels that hold the thrusters responsible for X-Y axis movement. These slots allow vertical adjustment of the thrusters in case the vehicle's center of buoyancy shifts. The top plate is made from HDPE, while the bottom plate is cut from flat 5 mm Aluminum 6061. The side frames hold the Z-axis thrusters and are made of stainless steel to withstand high torque loads. The bottom frame, which supports mission equipment and land-based weight, is reinforced with Z-shaped aluminum strips also bent using the press brake method. This structural approach increases the vehicle's payload capacity.

electronics.

Nihat Memduh Arslan

Ahmet Baş

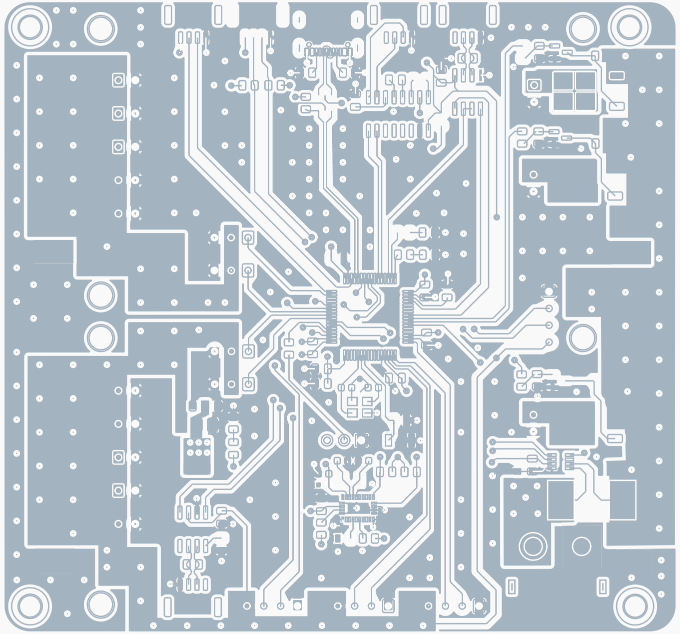
Hüseyin Yılmaz

Mehmet Erkılıç

Ravza Betül Karakaş

Taşkın Ökmen

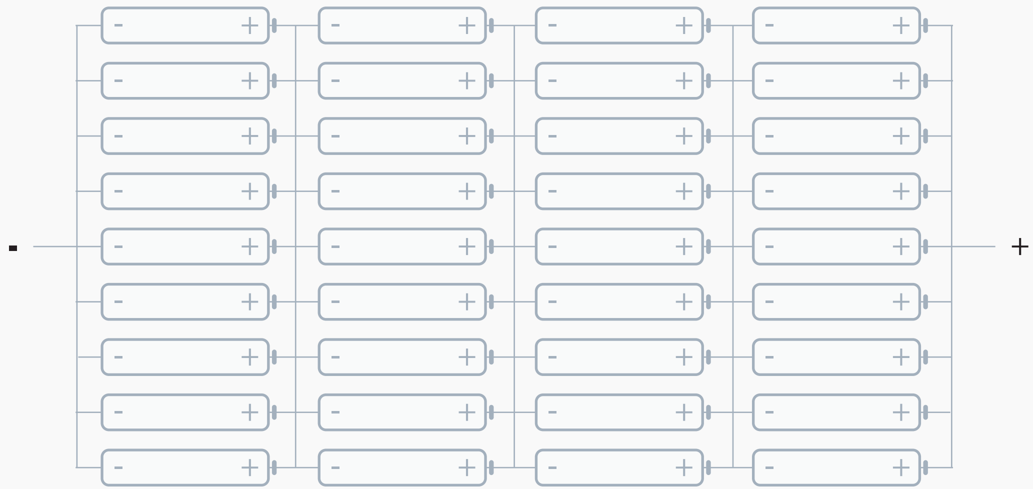
Tolga Öztürk



vehicle electronics.

To succeed in challenging missions under harsh conditions, the vehicle is equipped with a variety of sensors. At its core, the main board operates with a Real-Time Operating System (RTOS), handling safety features, communication with all sensors, control algorithms, and Input/Output (I/O) operations.

The onboard sensors include active sonars, passive sonars, an Inertial Measurement Unit (IMU), a Doppler Velocity Log (DVL), a pressure sensor, a temperature sensor, and a range of monocular and stereo cameras. The main board is also responsible for communicating with other circuit boards. These include the Battery Monitoring System (BMS), which provides data such as temperature, current, voltage, and State of Charge (SoC) of the main battery, and the Propulsion System Board (PSB), which manages all thrusters and provides data on their power consumption.

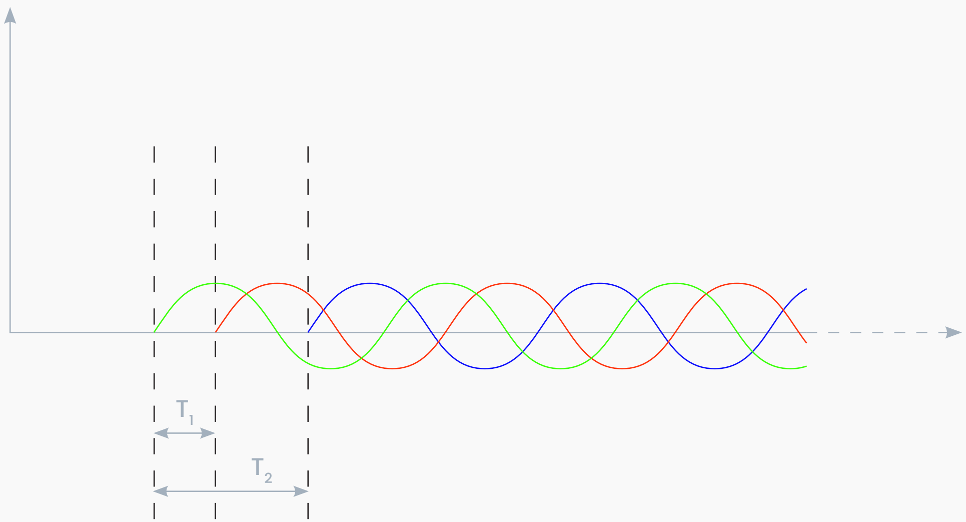


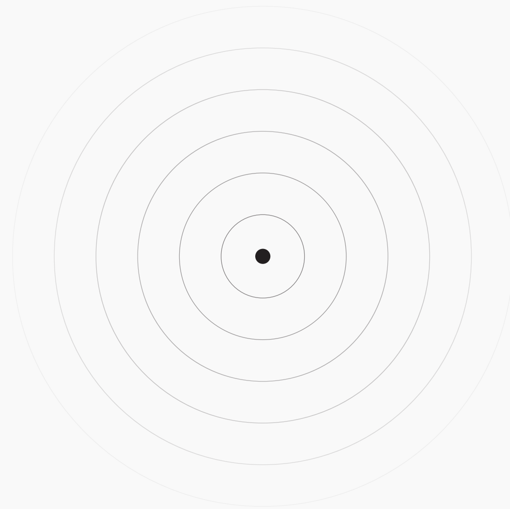
Li-ion

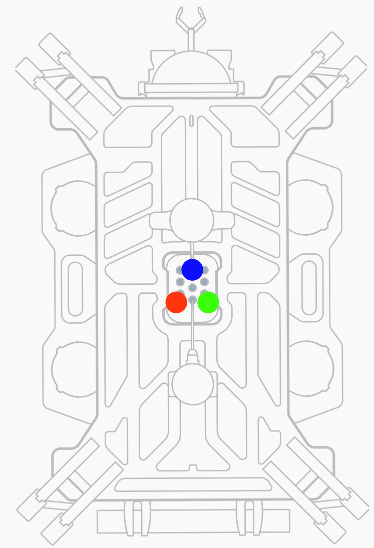
battery.

The vehicle operates using a custom-designed 4-series, 9-parallel (4S9P) Li-ion battery pack. The pack includes a fuse to prevent short circuits and a Battery Management System (BMS) to balance and charge the series-connected cells.

Inside the battery pack, Sony US18650VTC6 Li-ion cells are used. With the 4S9P configuration, the pack has an energy capacity of 400 Wh and can deliver up to 5300 W of peak power and 2000 W of continuous power. Compared to the previously used 3-series configurations, the 4-series setup provides a higher voltage, which helps reduce power losses by lowering the current drawn.

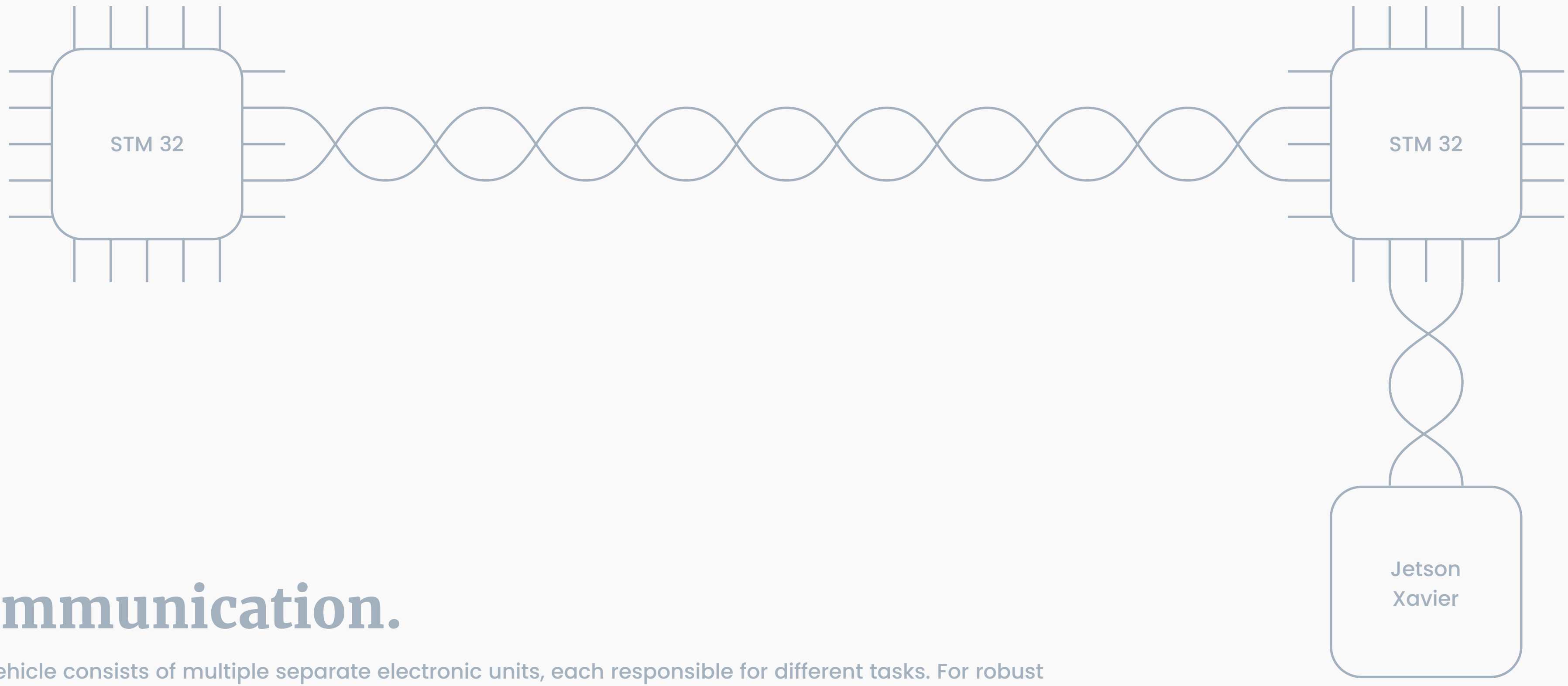






acoustics.

Underwater acoustics is a critical field that addresses challenges in communication, navigation, and ranging. To overcome these challenges, the vehicle is equipped with both passive and active SONAR systems. With the onboard Acoustic Processing Board (APB), the passive SONARs (hydrophones) can detect underwater sounds in the 25 kHz to 50 kHz range with high sensitivity. The board offers advanced signal processing capabilities through a custom-developed Acquisition Protocol (ACQ). It supports sampling frequencies up to 2 MHz and processes 16-bit captured data in real time using Short-Time Fourier Transform (STFT). Using Direction of Arrival (DOA) algorithms such as MUSIC and WAVES, the system can accurately determine the angle of incoming sound with very low error margins.



communication.

The vehicle consists of multiple separate electronic units, each responsible for different tasks. For robust internal communication, RS-485 is used between onboard systems. For higher-speed data transmission, USB High Speed is employed and routed to minimize Electromagnetic Interference (EMI). The vehicle's design supports EMI reduction by placing sensitive digital/analog components in the front enclosure and high-power components in the rear housing. During testing, a main communication cable—driven by Fathom-X modules—runs from both ends of the vehicle to the surface using twisted pair cables carrying Ethernet packets. Since the vehicle operates with ROS, the entire ROS network is accessible over the Ethernet link. This allows the surface computer to monitor sensor data and send commands to the vehicle. The software also includes safety mechanisms that shut down thruster operation in case of communication failure, helping to prevent emergencies.

software.

Ozan Hakan Tunca

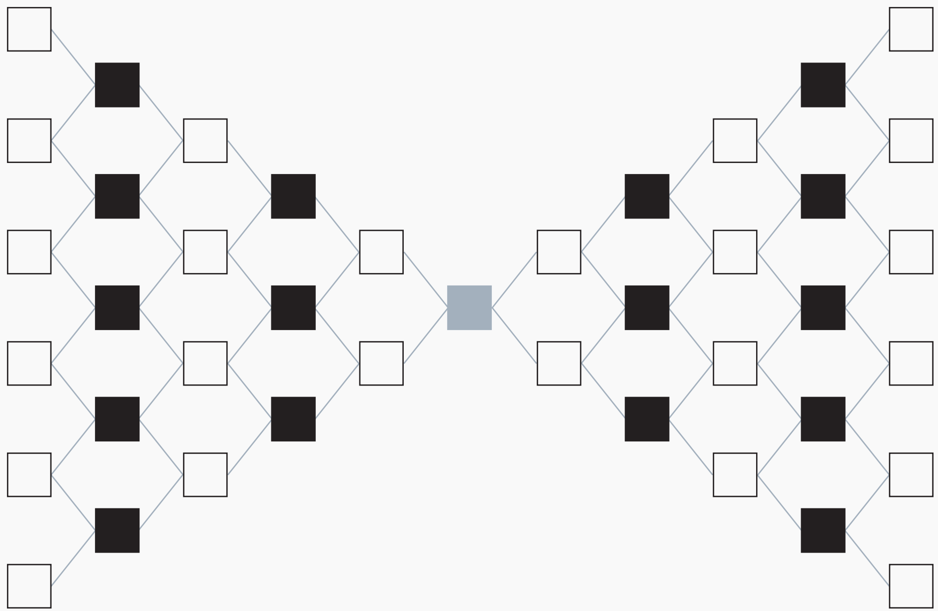
Faruk Mimarlar

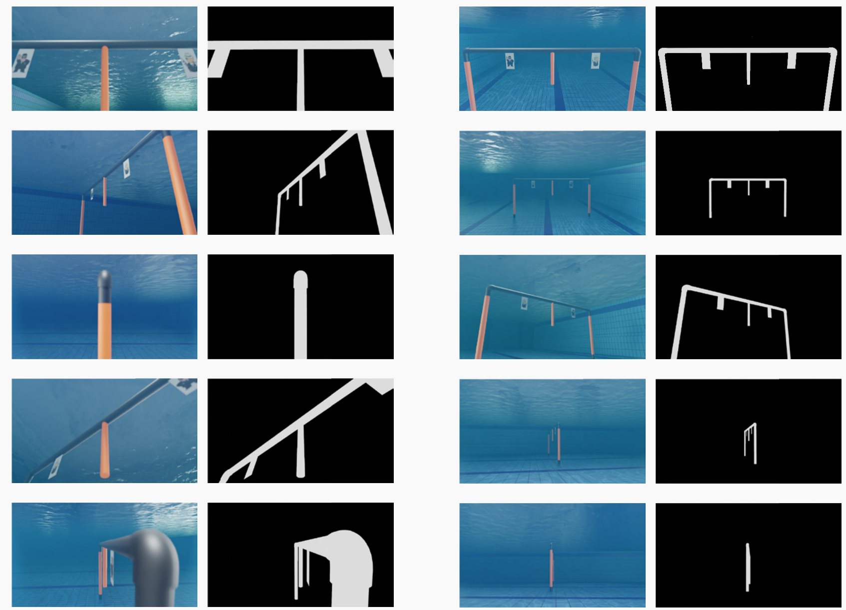
Mehmet Emin Meydanoğlu

Melih Okur

Seren Sıla Uysal

Talha Karasu

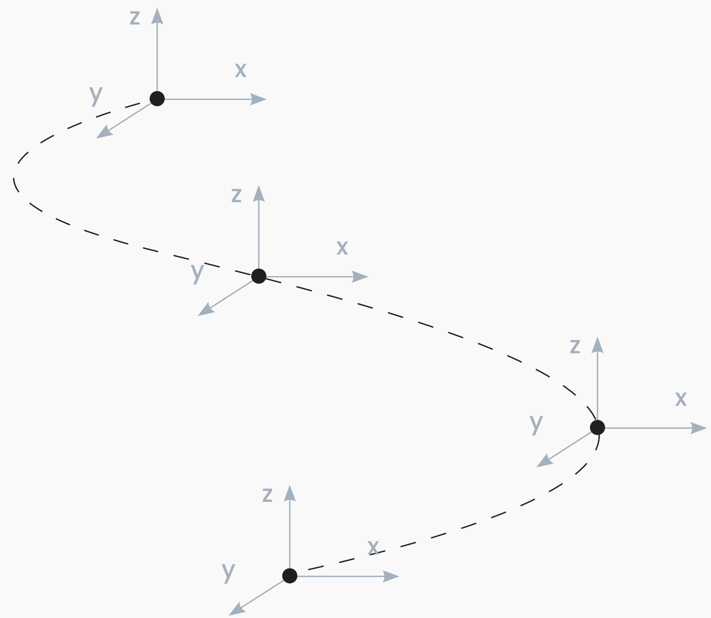


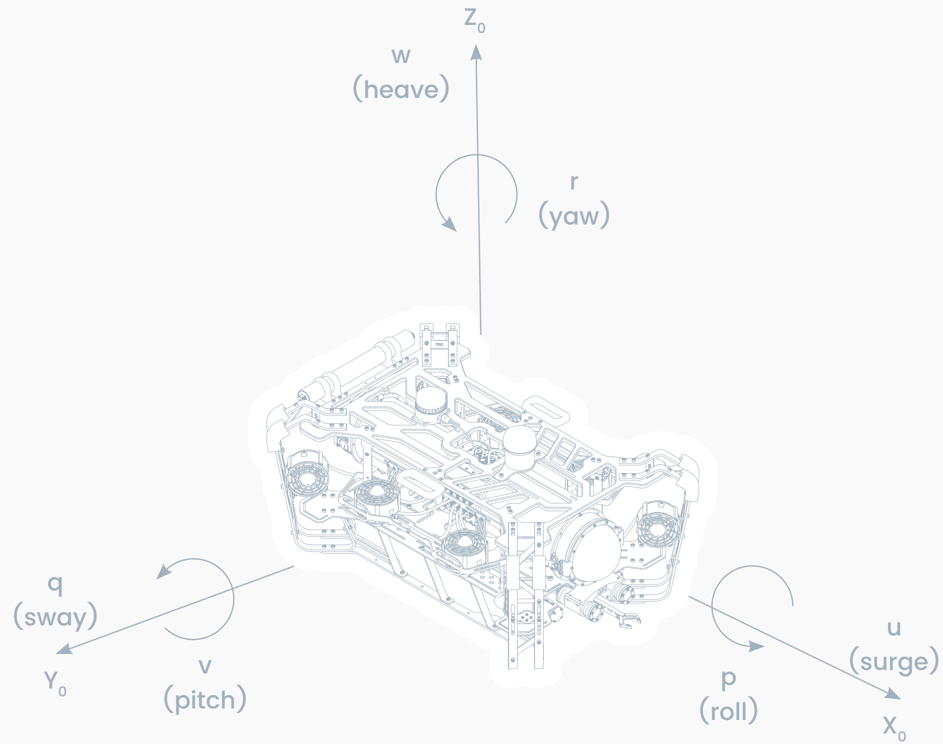


computer vision.

Detecting and identifying mission objects is a crucial capability for any autonomous underwater vehicle. To achieve this, a machine learning–based object recognition algorithm was developed using task-specific datasets.

The large dataset required for training the algorithm was generated and labeled using Blender 3D software, supported by custom automation scripts written specifically for this process.

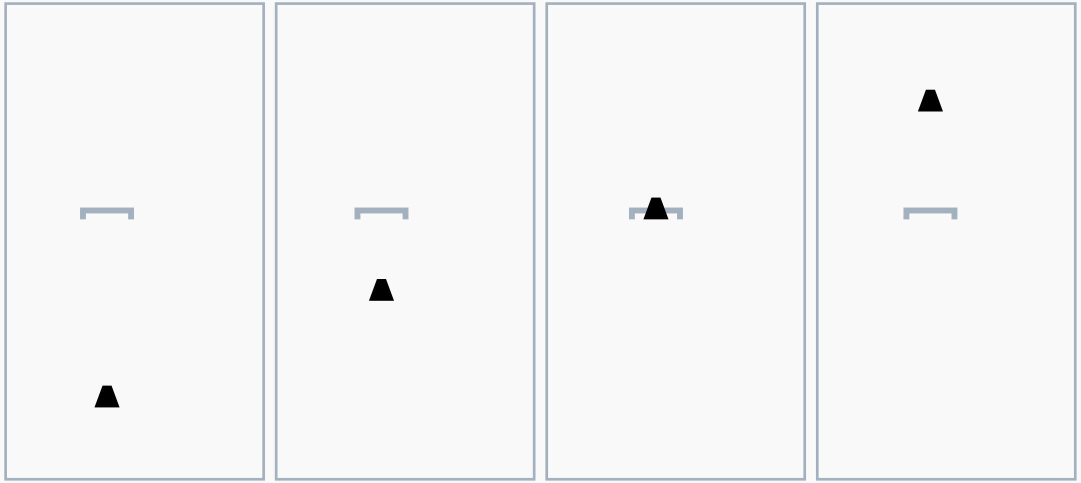


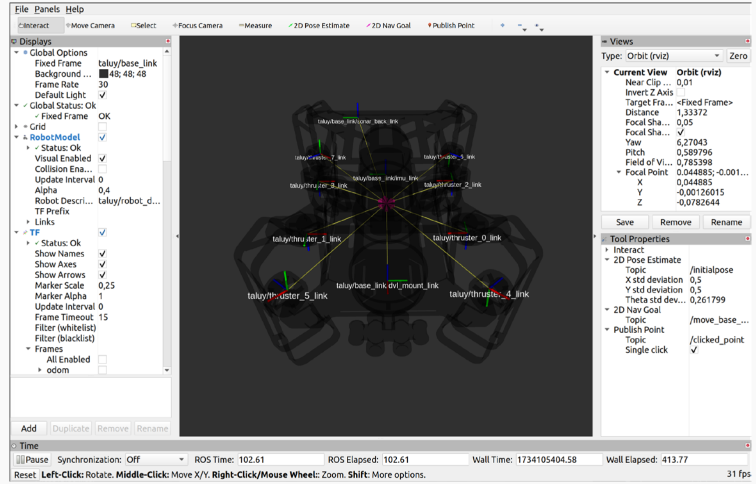


localization & navigation.

Localization enables the vehicle to determine its position and orientation, allowing for safe navigation, mapping, and environmental interaction. The vehicle's localization relies on data from sensors such as the IMU, DVL, and barometer, as well as images captured by onboard cameras.

These cameras track visual markers on the ground and utilize simultaneous localization and mapping (SLAM) algorithms like ORB-SLAM. The visual data is fused with acceleration, velocity, and position information from the IMU, DVL, and barometer using an Extended Kalman Filter (EKF), providing accurate estimates of speed and position in both Cartesian and polar coordinates.

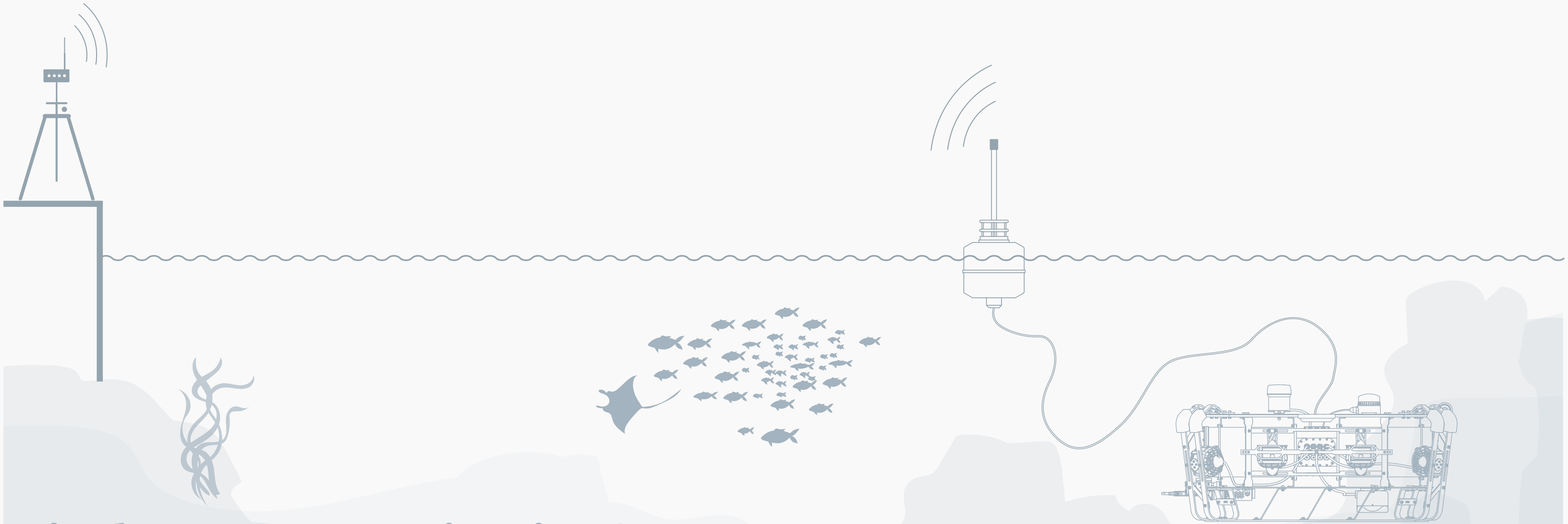




simulation & ros.

Our vehicle’s software architecture is built on the Robot Operating System (ROS). ROS provides an open-source, modular, and extensible platform that simplifies the integration of various robotic components. It offers hardware independence, allowing different sensors, cameras, and components to be easily adapted to the system. Additionally, ROS’s standardized communication structure enables seamless data sharing between modules.

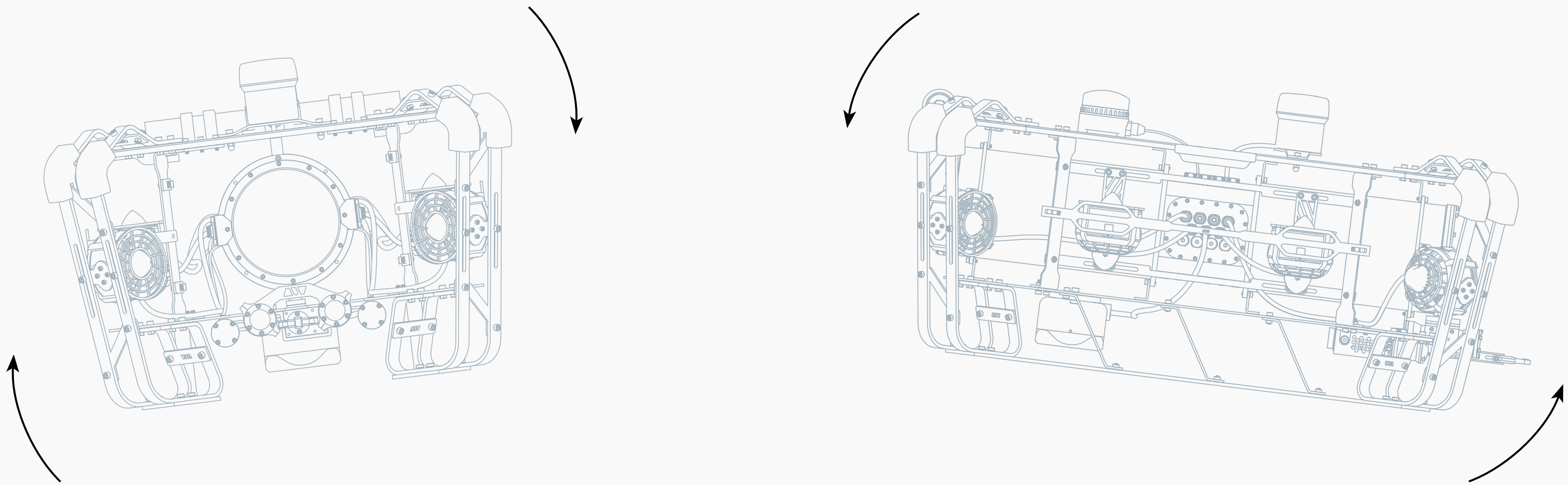
The vehicle’s mathematical model is rigorously tested in an underwater physics simulation based on Gazebo, which runs on ROS. This integrated approach allows us to optimize the entire process—from sensor data processing to motion control—continually improving the vehicle’s overall performance.



wireless communication.

To maintain communication with the ground station, the vehicle is connected to a tethered buoy. A wired connection is established between the onboard computer and the buoy's computer, while a wireless connection is set up between the buoy's modem and the ground station's modem. This setup ensures continuous data flow between the vehicle and the ground station.

Additionally, the buoy follows the vehicle using a camera mounted underneath and a guide light placed on top of the vehicle. This light not only helps the buoy track the vehicle but also provides relative position data. Combined with the GPS sensor on the buoy, the vehicle's precise position can be determined, significantly simplifying the localization process.



auto-leveling.

An automatic balancing algorithm has been developed to maintain the vehicle’s stability and motion. This system continuously measures the vehicle’s orientation and makes real-time adjustments using four upward-facing thrusters and a PID (Proportional-Integral-Derivative) controller to effectively minimize roll and pitch movements.

This approach enables the vehicle to maintain stability even in rough sea conditions, allowing it to perform its tasks with high accuracy and precision.

creative.

Dilara Yetiş

Emre Orkun Kayran

vision.

The creative team is the unit responsible for the team’s project presentations and promotional content. It utilizes all available tools to ensure the team stands out and gains support from potential investors. Composed of the unseen heroes behind memorable visual design, curiosity, and all things good, the team plays a key role in making a lasting impression.

action.

The team oversees the creation of graphic content during the production process and shapes the team’s visual communication by including video and photo shoots. It is responsible for the design and printing of posters, catalogs, business cards, logos, and team uniforms. It also captures the team’s performance and ensures the footage is edited and produced to suit social media content.

organization.

Zeynep Demirbaş

Tarık Kaya

Şeyma Özer

Yağmur Yasmin Emri

crew.

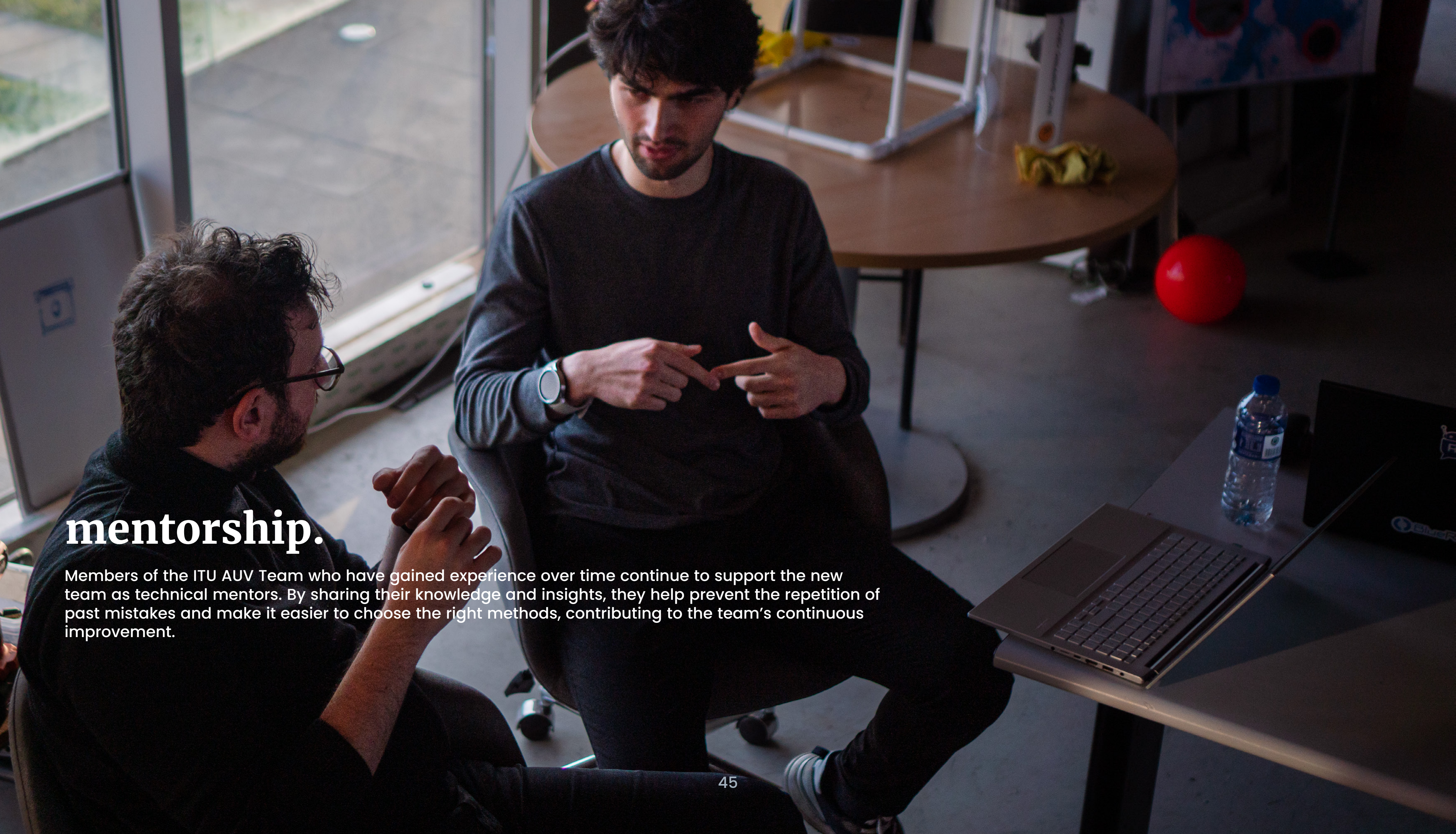
The team takes on key responsibilities to ensure effective and successful operation. Its duties include organizing internal team activities and coordinating testing processes. It also communicates with university and faculty administrations and keeps track of competition-related matters.

guidance.

As the ITU AUV Team, we care about inspiring future generations. We share our knowledge and experience with student teams working in this field, such as those from Cağaloğlu Anatolian High School, Adana Science High School, and Beşiktaş Anatolian High School. For younger students, we introduce our vehicle to spark curiosity and excitement about underwater robotics.

community.

We are working to enhance knowledge sharing among all underwater teams in Türkiye and to expand our community. In this direction, we organize events where we invite underwater teams from across the country, aiming to create a shared synergy by getting to know each other better and exchanging experiences.



mentorship.

Members of the ITU AUV Team who have gained experience over time continue to support the new team as technical mentors. By sharing their knowledge and insights, they help prevent the repetition of past mistakes and make it easier to choose the right methods, contributing to the team's continuous improvement.

sponsorship.

Developing autonomous underwater vehicles is made possible through the valuable support of sponsors. In this context, the team aims to establish sponsorship relationships based on shared goals and to manage the production and competition processes efficiently by utilizing this support in the most effective way.

sponsors.

preivous sponsors.

previous sponsors.

material suppliers.

ÜNAL HARİTA

İZELTAŞ

PROCASE BOX INDUSTRY

SOLDEX

PHOENIX CONTACT

tesa

HUTEK Termoform Kalıpları

EKOM simply electronics

wishlist.

Mechanic

Production cost

Hardware requirements

Maintenance fee

Creative

Printing expenses

Rental services

Software licenses

Organization

Logistics support

Accommodation

Competition fee

Software

Server setup

Hardware components

License payments

Electronics

PCB manufacturing

Sensor taxation

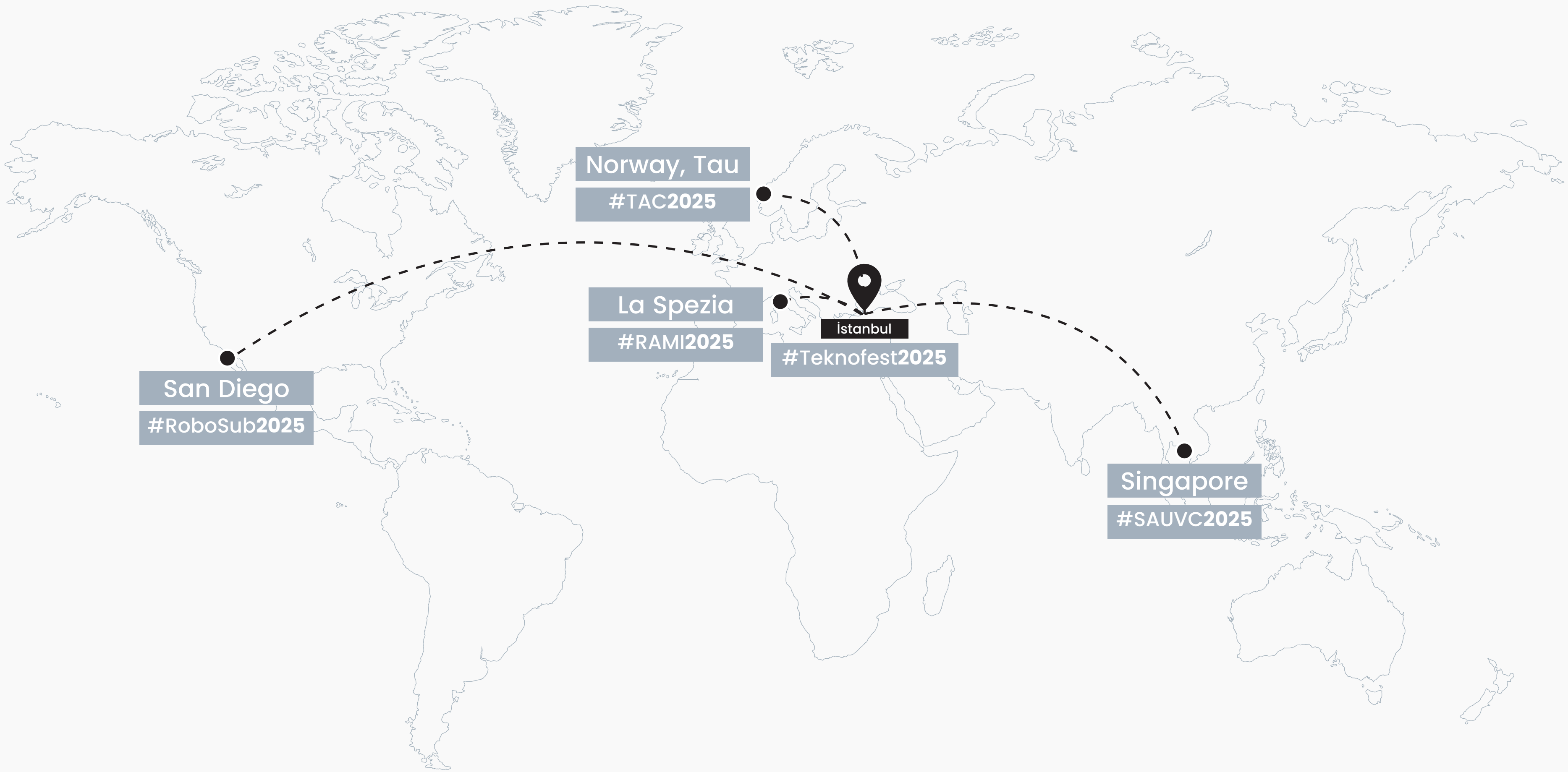
Component support

packages.

	appreciation post on social media	adding the company logo in the team portfolio	adding the company name and logo on our website	tax exemption	e-mail newsletter	back sponsorship on the competition jersey	logo placement on the competition roll-up banner
master sponsor.	●	●	●	●	●	●	●
diamond. **500k**	●	●	●	●	●	●	●
platin. **250k**	●	●	●	●	●	●	●
gold. **150k**	●	●	●	●	●	●	●
silver. **70k**	●	●	●	●	●	●	●
bronze. **30k**	●	●	●	●	●	●	

company logo added to the team portfolio	company logo added to the RoboSub robot	organizing social responsibility projects together with the company	joint media and advertising campaigns	company promotion on our YouTube channel	chest sponsorship on the competition jersey	naming the RoboSub robot by the company	naming the team
●	●	●	●	●	●	●	●
●	●	●	●	●			
●	●	●	●				
●	●	●					
●	●						

flight packages.



	appreciation post on social media	adding the company logo in the team portfolio	adding the company name and logo on our website	tax exemption	e-mail newsletter	back sponsorship on the competition jersey	logo placement on the competition roll-up banner	company logo added to the Robosub robot	organizing social responsibility projects together with the company	joint media and advertising campaigns
1-2	●	●	●	●	●	●	●	●		
3-4	●	●	●	●	●	●	●	●	●	
5+	●	●	●	●	●	●	●	●	●	●

catalog design.

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Namiq Mahmudov

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