

CROATIA



*ASSOCIATION OF APPLIED
TECHNICAL SCIENCE*



SOLAR & ENERGY BOAT CHALLENGE

2-6 JULY 2019

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About the Country :

Croatia is a Central European and Mediterranean country. Croatia is classified as an open and developing economy by the International Monetary Fund and a high income economy by the World Bank. Traditionally, Croatia is a tourism oriented country. Zagreb is the capital and the largest city in the country.

About the University/Industry :

Founded in 1973, the University of Rijeka has matured into a modern European university and center of excellence whose impact extends beyond the region. With a total of 11 faculties and 4 departments, we are a research, science, and education-oriented university that supports social and economic development in our community, the City of Rijeka, and the wider region.



About the team

The UNIRI ADRIA HYDROFOIL SOLAR BOAT is a part student project within the Association of Applied Technical Science and the Association was founded on the 24. of October 2018. in Rijeka.

The association brings together students from the University of Rijeka, engineers, assistants and professors.

The projects of the association are based on modern technology and approach to problem solving, emphasizing the importance of environmental protection and engineering ethics.

List all the team members and their role:

- Ljubomir Pozder – Team manager/mentor
- Filip Karadžić – Communication Manager
- Tomislav Babić – Pilot
- Damir Lukšić – Head of Electronics
- Stefano Beaković – Electronics officer
- Dario Vukas – Welding officer
- Nino Jukić – Visual art
- Petar Topljak – Head of Engineering Department
- Kunigunda Brnabić – Hull production and Visual design
- Mineo Jelovac – Deputy pilot
- Ivan Marinić – Production and logistic officer
- Diego Tumara – Web design
- Damir Edward Katkhuda – Industrial mentor



Photo of the Team

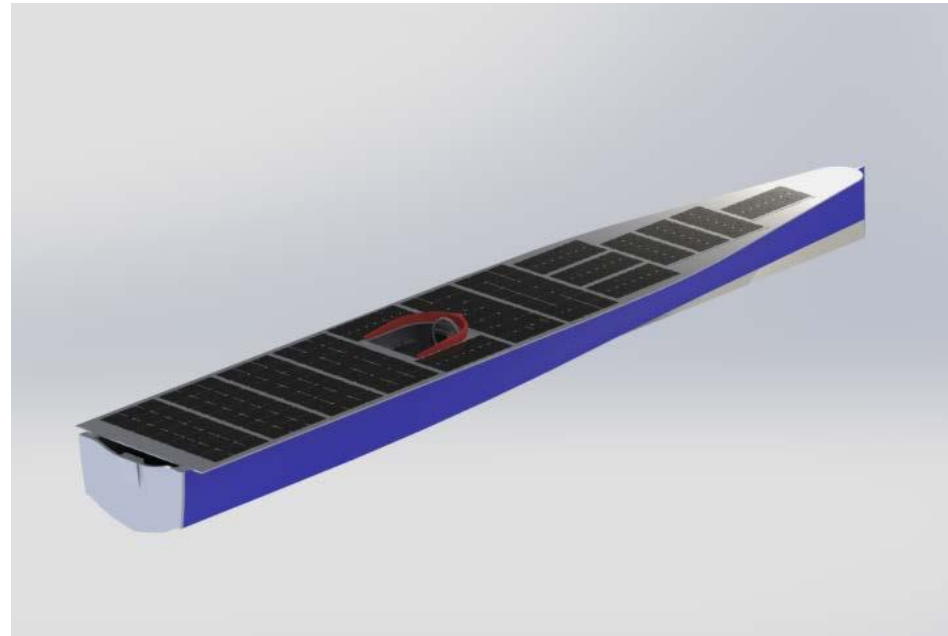
Boat Characteristics:

- **LOA: 7,2 m**
- **Beam: 1 m**
- **Draft: 0,11 m**



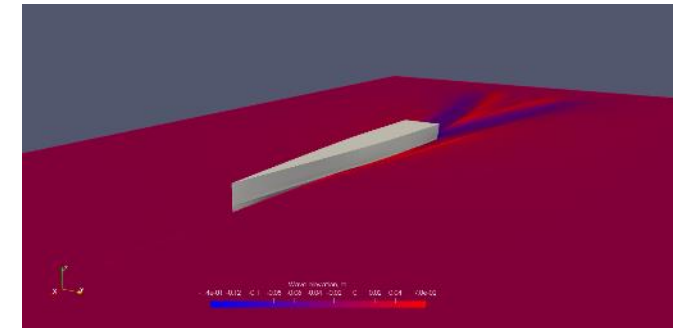
Propulsion Characteristics:

- **NAVY 6.0 E-propulsion**
- **Driver Module**
- **NAVY Remote Control**
- **Different types of propellers**



3D functional model

Inspiration Boat: Super Korean fast boat the vessel will be less influenced by weather, and pitch motion and wave drift will be reduced

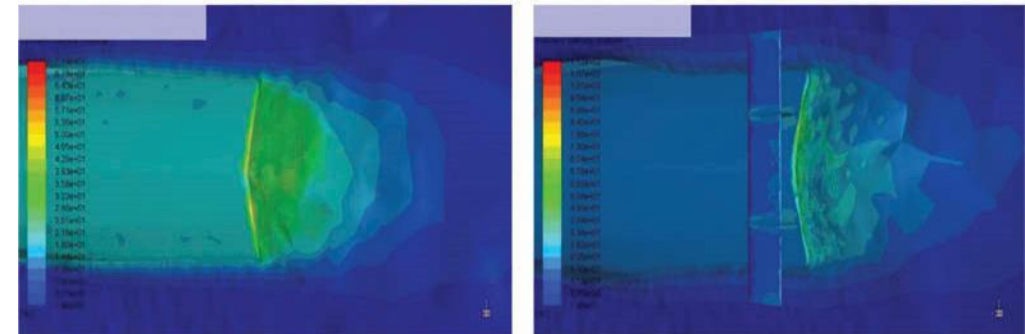
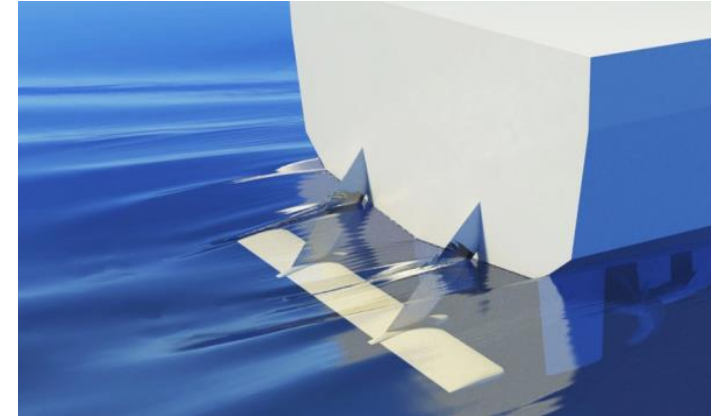


CFD model hull

Conception Methods, Design, Optimisation :

HULL VANE

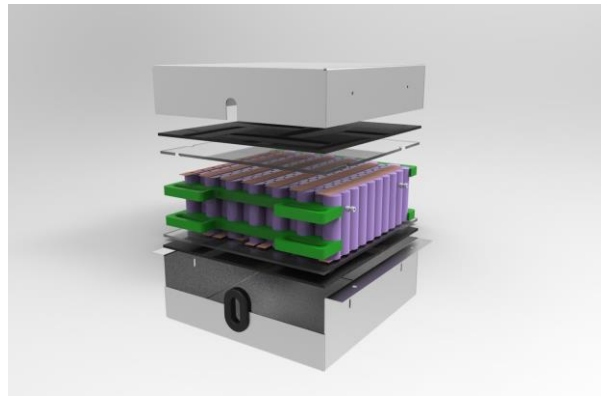
This is a hydrodynamic wing-shaped appendage to improve the performance and seakeeping of ships. CFD analysis gives us reduced resistance of the aft waves



NACA 4412

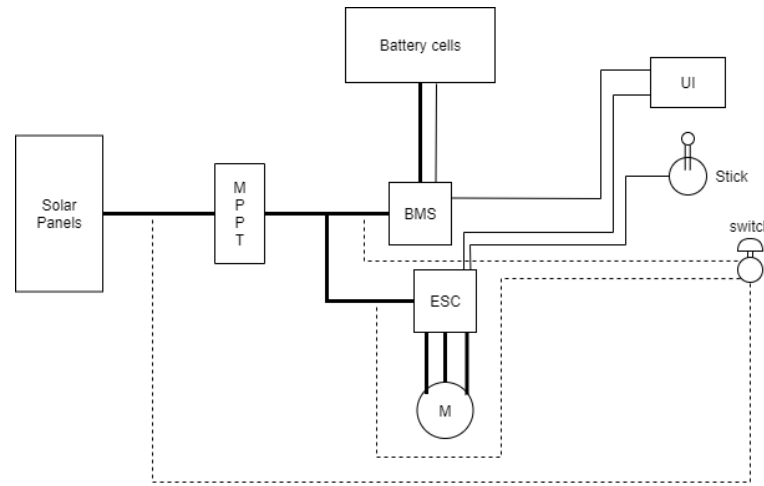
Conception Methods, Design, Optimisation:

Electrical system

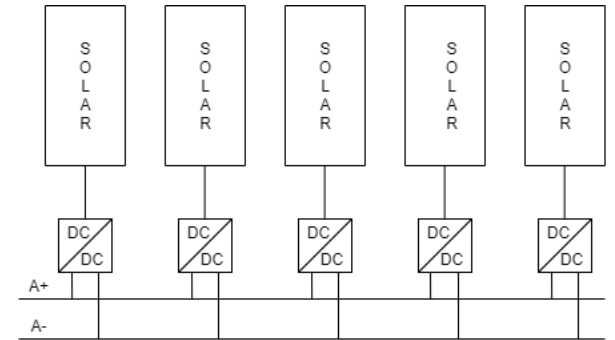


Battery pack

Capacity: 1.5 kWh → 1500Wh → 1500Wh/48V → 31.25Ah
 Cells: 176 pcs LiFePo4
 Paralels: 11
 Series: 16
 Discharge current:
 Voltage (nominal): 44.4 V
 Voltage (Max.): 50.4 V
 Voltage (Min.): 31.2 V

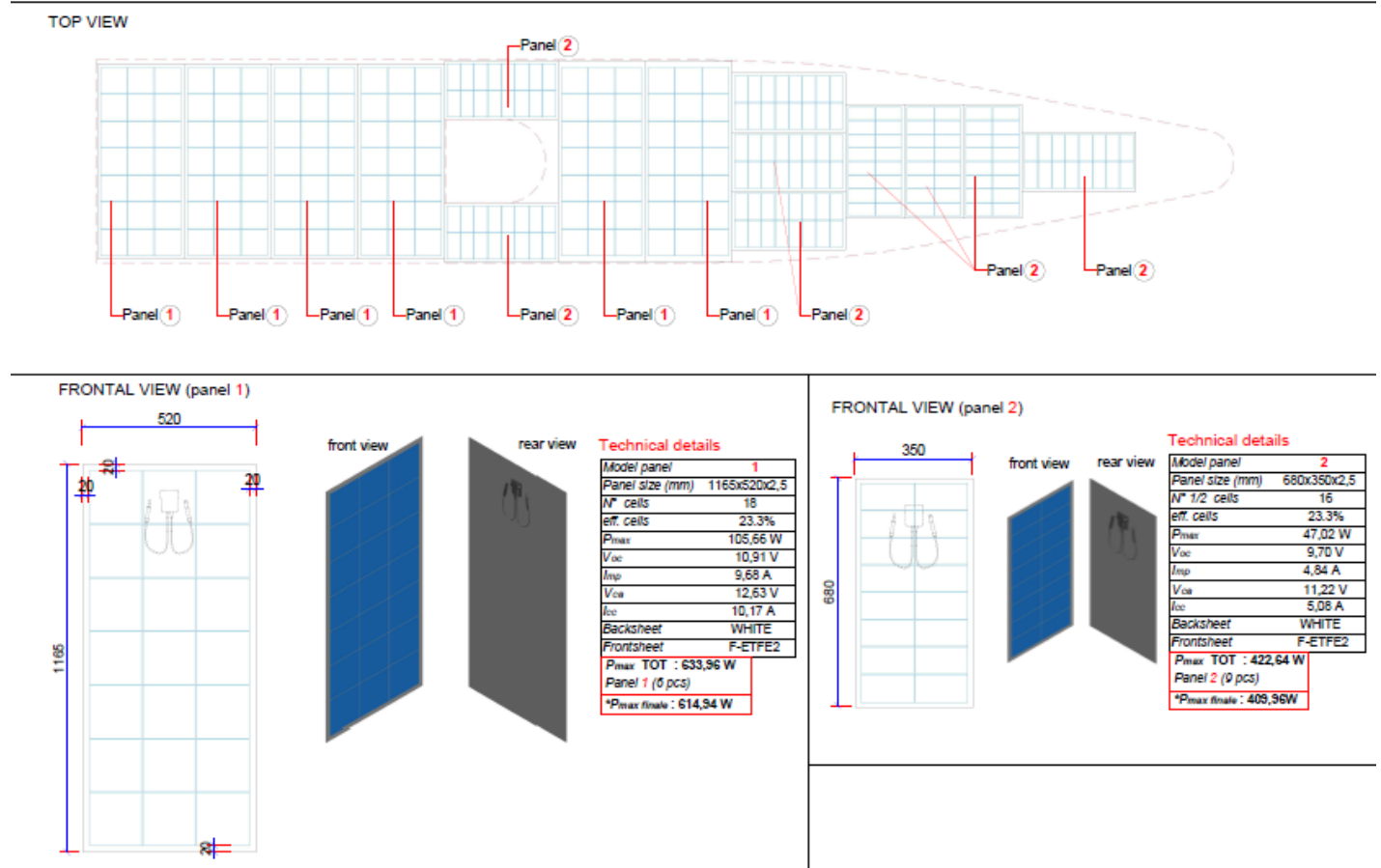


Concept of electrical system



Solar panels

Conception Methods, Design, Optimisation: Solar Panels



Materials:



- Low density styrofoam
- Carbon and glass fiber reinforcement
- Epoxy eco resin and catalyst
- 3D printed eco plastic

Problems faced:



- Inadequate workspace
- Lack of resources: solar panels, BMS, charger for battery, electric motors, high pricing of materials
- Limited budget – independent student association
- Lack of support from Faculty of Engineering - Rijeka

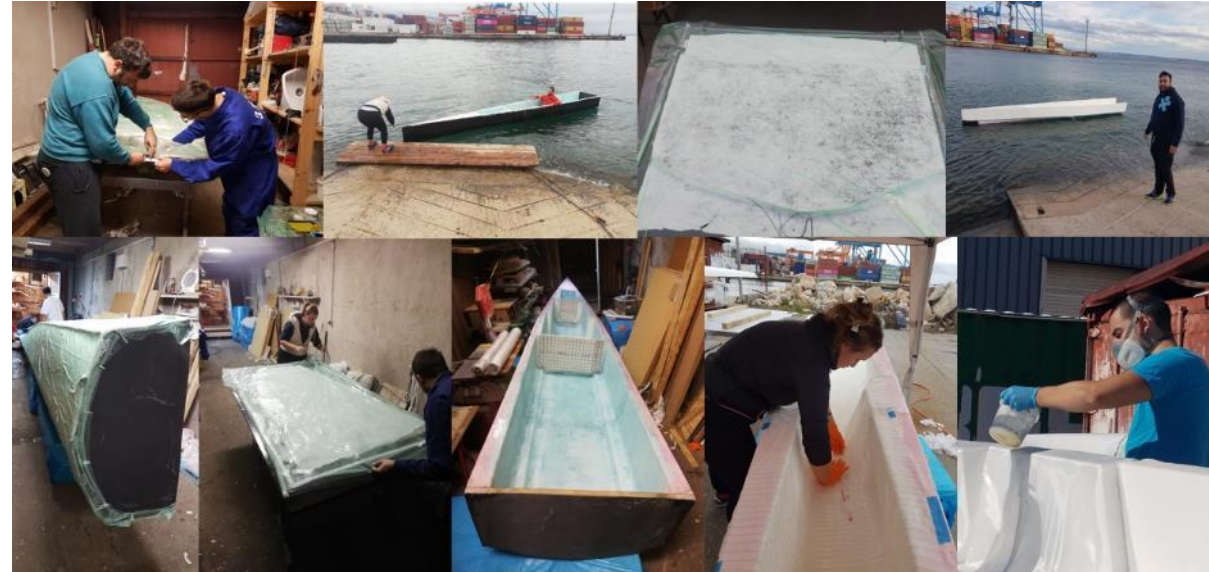


Photo of production

Budget:
15.000 €



Time of production :
3 months



Testing & Results



Results description



- **Maximum speed – 15 knots**
- **Good response of hull in high waves**



Challenge of the Expert

The Special Feature(s)

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-
-

Description

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-
.....
-
.....
-
.....

After examination of the technical documentation of each teams, the Expert will select the special features of your boat(s) on which ones you will have to talk.

Special Feature of the Boat(s)

Special Feature of the Boat(s)



Efficiency Gain

-
-
-
-

Explain how to transfer the special features of your boat/propulsion for industrialisation.

Present a Business plan financed by the gain of the efficiency

Description

-
-
-
-
-
-

Special Feature of the Boat/propulsion

Special Feature of the Boat/propulsion

Any questions?

