

## COMPANY SPECS

**School name:** Xi'an Jiaotong University

**Organization name:** Deep Dive Dragon

**Home state:** Xi'an, ShanXi

**Country:** China

**History of MATE competition participation:** It is our first time to participate in the Mate competition.

**Company Photo:**



### Team members:

The CEO — Chuan Jiang, 4<sup>th</sup> Year Measurement and control technology and instruments

### Electric control team

Overall scheme design (responsible person)/Code bottom -- Zhiheng Huang, 3<sup>rd</sup> Year Electric engineering

Chassis propulsion -- Shuheng Zhao, 2<sup>nd</sup> Year Mechanical engineering.

Posture adjustment -- Xiaoke Wang, 2<sup>nd</sup> Electric engineering

Robot arm control -- Zhibo Cui, 2<sup>nd</sup> Mechanical engineering

Depth Detection -- Meng Sun, 2<sup>nd</sup> Mechanical engineering

### Visual control team

Overall program design (responsible person) -- Weishi Mi, 4<sup>th</sup> Year Automatic control engineering

Red Rope Trail -- Xuanhao Huang, 3<sup>rd</sup> Year Automatic control engineering

Automatic inbound and point recognition -- Ye Tian, 2<sup>nd</sup> Mechanical engineering

Measuring fish length -- Chengxiang Sun, 2<sup>nd</sup> Mechanical engineering

Raspberry PI control and network management Danfeng Yue, 2<sup>nd</sup> Mechanical engineering

Identify dead fish-- Yuheng Zhang , 1<sup>st</sup> Artificial intelligence

### Mechanics team

Overall program design (responsible person) --Siyu Zu, 4<sup>th</sup> Year Mechanical engineering

Mechanical claw design and manufacturing robot assembly, buoyancy optimization --Peijun Chen, 2<sup>nd</sup> Mechanical engineering.

Robot design and fabrication, assembly, wiring

--Yunfeng Zhou, 2<sup>nd</sup> Year Electric engineering

Shore control box design--Yimeng Zhao, 2<sup>nd</sup> Mechanical engineering.

set construction--Boyu Han, 1<sup>st</sup> Energy and Power engineering

Translation—Bingya Han, 3<sup>rd</sup> Mechanical engineering

Paper Writer— Yi Rong, 4<sup>th</sup> Year Mechanical engineering

### **ROV SPECS**

**ROV name:** Deep Dive Dragon

**Total cost:** ¥21024.64

**Size:**

608 mm long

626 mm wide

291 mm high

**Weight:** 9.2kg

**Total student-hours to design and build:** About 12 weeks

**Safety features:**

Our robot is designed and made to meet MATE and company safety features. The robot's frame is made of glass fiber and was modeled based on the absence of all sorts of sharp edges and corners to avoid cut injury. Guards are made of print material and placed on every thruster, front and back side. The mesh on the guard is designed to meet the parameter requirement of no bigger than 12.5mm to avoid anybody checking thruster being injured (figure).

All electronic components are fastened with epoxy and hot glue, and wires are also hot shrunk and treated with silica gel at the holes going through from inner to outer. As for the wires outside, they are also properly waterproofed with hot glue. Additionally, a function is set to cut the power source in case of possible water leaking to secure safety. And after our ROV being completed, we did a final check to make sure it fulfill all the safety requirements.



## Special features:

### Robotic Arm

Because the tasks require the robot to grasp objects of various shapes, the team designed a single robotic arm with a mechanical claw. The robotic arm and claw are controlled by the steering gear and they can achieve  $180^\circ$  and  $360^\circ$  rotation, respectively. After testing, the grip of the mechanical claw can be stably controlled, and a variety of shapes of rigid and soft bodies can be grasped.

### Binocular Camera

Due to the need to measure the length of the fish, the team choose to use a binocular camera. Controlled by the Raspberry Pi, it can transmit underwater video in real time, so the computer is able is take pictures, take screenshots, and perform a series of tasks such as object recognition and length measurement.

## Photo of the vehicle:

