

# Underwater Vehicle with Front-rear Distributed Drive

 Energy & Environment

 Manufacturing

Robotics

Smart Mobility and Electric Vehicle

## Opportunity

The technical problem addressed involves the limitations of existing Unmanned Underwater Vehicles (UUVs). While these UUVs allow for remote or autonomous operations in aquatic environments, their stability and agility are often compromised. Traditional methods involve propulsion by tail and fin, which can result in unstable movements in varied water flow conditions. Other designs, like torpedoes, can only move in a specific direction, limiting their manoeuvrability and turning capabilities in complex underwater environments. Therefore, there is an avenue for an invention that increases the UUV's stability, agility, and overall movement control, significantly improving underwater exploration and detection capabilities.

## Technology

The innovative underwater vehicle equipped with a main body, front-drive mechanism, rear-drive mechanism and a steering assembly. The main body has a longitudinal axis stretching from its front to rear. The front-drive mechanism provides propulsion along this axis, while the rear-drive mechanism coupled with the steering assembly offers greater control and manoeuvrability. The steering assembly is unique as it is designed to rotate the rear-drive mechanism relative to the longitudinal axis, offering lateral force as needed. This configuration ensures better stability, agility, and easily controlled turning motion, outclassing traditional UUV designs.

## Advantages

- The invention offers improved stability with its unique design and operational set-up.
- The vehicle boasts greater agility than conventional UUVs due to its enhanced steering capabilities.
- Offering easily controlled turning motion, this invention provides superior maneuverability.
- Incorporating separate front and rear drive mechanisms allows for a broader range of movements.
- The vehicle can adapt seamlessly to varying water flow conditions.

### IP Status

Patent granted



Technology Readiness Level (TRL) ?

6

Inventor(s)

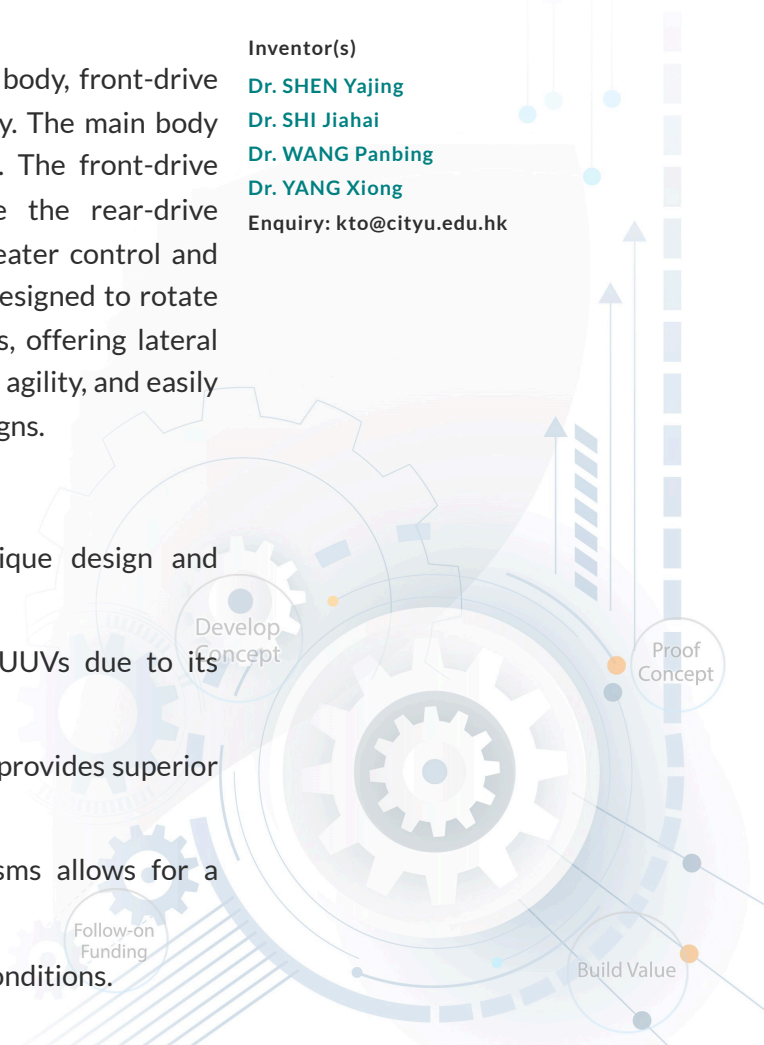
Dr. SHEN Yajing

Dr. SHI Jiahai

Dr. WANG Panbing

Dr. YANG Xiong

Enquiry: [kto@cityu.edu.hk](mailto:kto@cityu.edu.hk)



## Applications

- Efficient exploration of complex and deep-sea environments.
- Underwater research, especially involving detection tasks.
- Studying marine life in their natural habitat.
- Allow for remote underwater operations.
- Risky or dangerous underwater conditions, protecting human lives.

