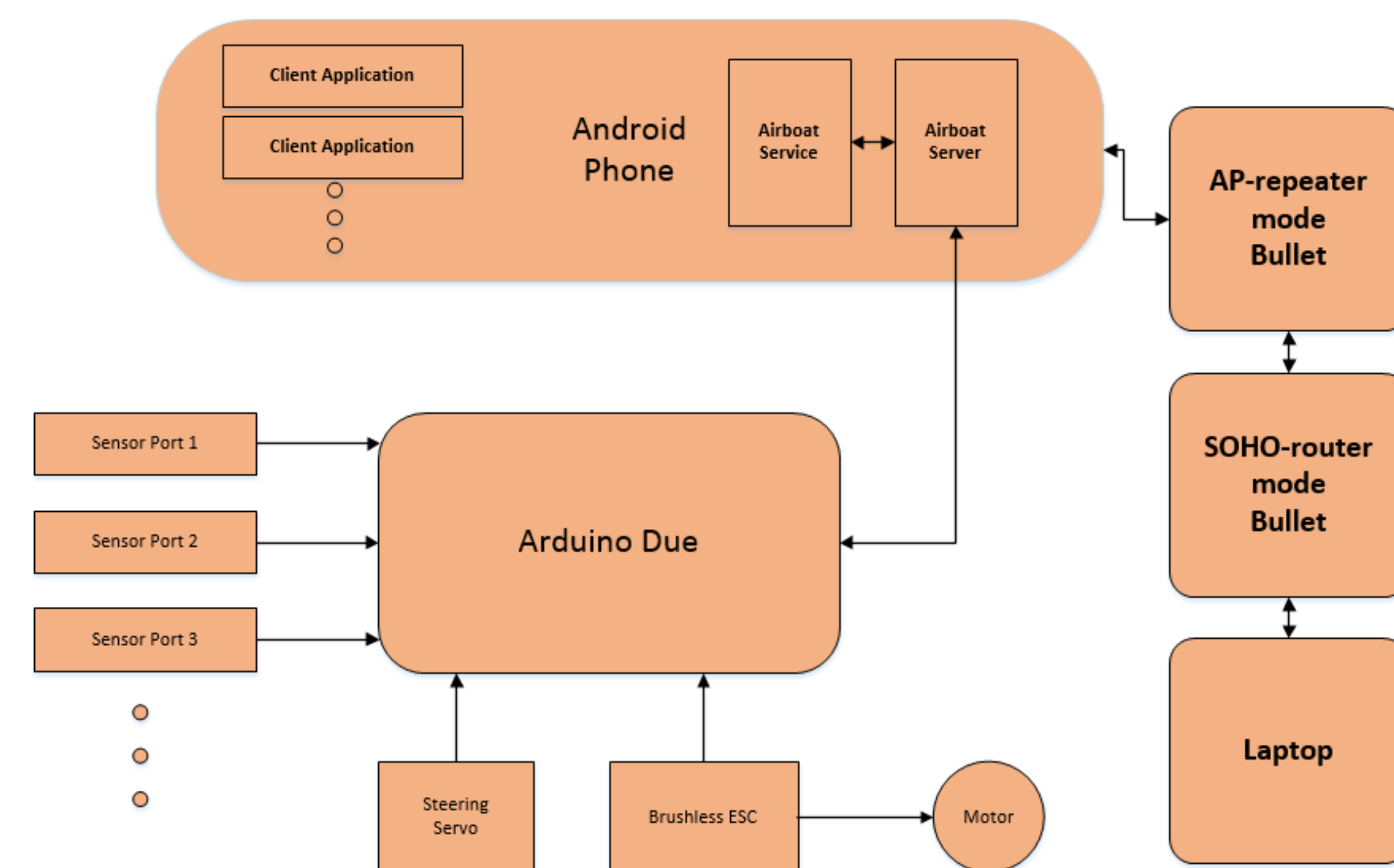


CRW Platform

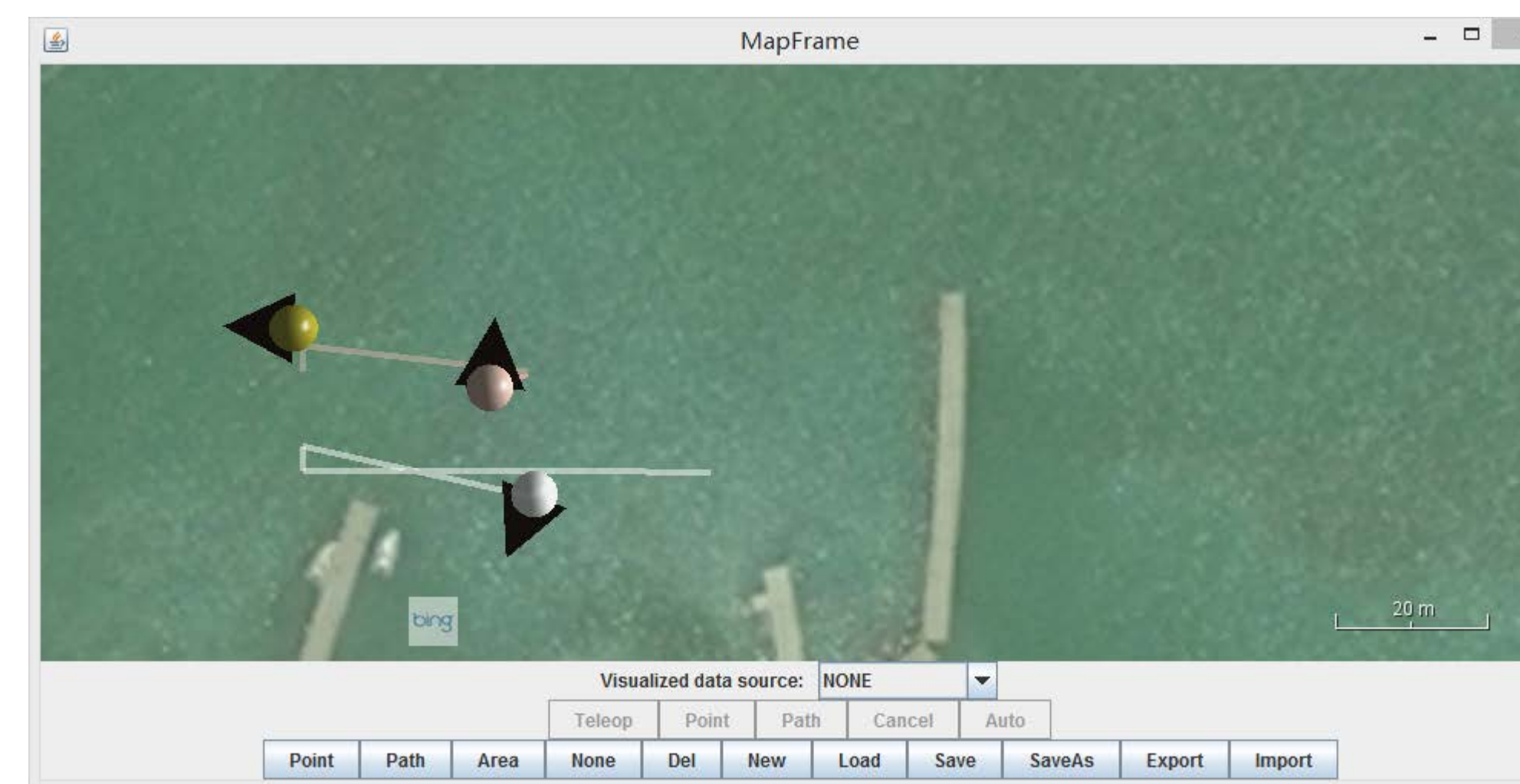


We are working with a team of robotic boats, a human operator gives high level commands to from the shoreline. The setup earlier used a single Bullet router which was put on the shoreline, but had decreased range talking to the boats due to the effects of water on electromagnetic waves. By configuring another Bullet in AP-repeater mode and putting it on a boat, we can extend the range of the network.

Madara

Madara is an open-sourced middleware which enable distributed, decentralized artificial intelligence including machine learning, reinforcement learning, fuzzy logic, and rule-based state machines. It also provide configurable quality-of-service in all middleware features to enable developers to have more control over artificial intelligence and communication between agents.

Operator GUI



The GUI for the boat system is written in Java and manages communication between boats, allowing each boat to explore different speeds and routes. The picture above shows three boats exploring the specific area.

Test Methods

In order to make sure the SOHO router and the AP-repeater are configured correctly, we use WireShark to capture the packets the SOHO router and AP-repeater router send. The result shows that the AP-repeater mode bullet mimics the packets that SOHO router sends, so it proves they are set in the same wireless network.

Result



Now we put the Bullet in the boat, which talks to the boat's phone (Also a sharkfin antenna connect to the Bullet), which is connected to Arduino Due. The laptop GUI will send the navigation

commands to the phone's app, which controls the boat. The bullet will help extend the controlling range of the laptop.

Future



Our goal is to make the boats team work together, and their function will be various such as exploring new

areas, detecting the environment of new situation. With the development of different types of boats, they will communicate with each other tightly and be much more powerful.