Bio-Inspired Self-Burying Autonomous Underwater Vehicle

In between missions, autonomous underwater vehicles (AUVs) typically need to dock or be retrieved out of the water. However, such operation can be difficult to complete. If the vehicle missions are short, it may be beneficial for the vehicle to stay on the sea floor until an event or a timer triggers the next mission to start. Unfortunately, ocean currents may cause the vehicle to be picked off the seafloor and caught in the current. To overcome this challenge, the team shall design, fabricate, and test a bio-inspired underwater vehicle with self-burying capability.

System Level Requirements:

1. The group shall design an underwater vehicle that can travel over a distance of approximately 10 [m] using programmed waypoints, land on a sandy bed, and stay on the ground when a vertical pull of 40 [N] is applied to the vehicle. Following a triggered event (which could be a timer), the vehicle shall return to the surface and travel back to its launch point.

2. Requirement 1 + when on the ground, the vehicle shall move to the sides half its volume in sand from underneath its body.

3. Requirement 2 + instead of moving the sand to the side, the vehicle shall cover itself with the displaced sand.

Operating Requirements

- The vehicle should be carried by two persons.
- The vehicle must have the capability to operate for at least 30 [min].
- The vehicle must be small enough to operate in the outside pool of the Engineering West Building in the Boca Campus.

Figure 4. Bio-Inspired Self-Burying Autonomous Underwater Vehicle.