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1 Abstract

***Abstract*—Hi, this is the abstract O__Ø!**

2 Design Evolution

3 Design & Manufacturing Process

3.1 Mechanical

3.1.1 Probably something mechanical

YOU WOULD NOT BELIEVE IT. but, it's probably something mechanical.

3.1.1.1 flexing the depth of the sectioning

3.2 Electrical

3.2.1 Probably something electrical

yeah, probably something electrical.

3.3 Software

3.3.1 Kinematics

The Kamikaze's movement underwater may be one of the most important aspects of the design. We had to ensure stability, maneuverability, and speed. We achieved this by focusing on three main aspects:

- **Thrusters:** We employed a seventh thruster this year to improve the robot's maneuverability. With the current vectored thrusters configuration and this new thruster, we can achieve motion in 6 degrees of freedom. This novel configuration maybe the first of its kind to allow for such a wide range of motion while only using 7 thrusters.
- **PID Control:** We have implemented PID controllers for all critical movement axes, allowing for precise control over the robot's movement and ensures that it remains stable in the water. We implemented an FFT (Fast Fourier Transform) based auto-tuning algorithm to tune the PID parameters, as this is our first year using the new Vehicle. We also supplemented the algorithm with a live plotting feature to allow for manual adjustments to the PID parameters.
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3.4 Open Sourcing the Kamikaze

We have all of our working code available on our GitHub repository. A lot of effort was made this year to maintain, document, and clean up the code, making it easier for future teams to understand and build upon. We believe that this is a crucial step in the development of the Kamikaze, as it allows for a more collaborative environment and ensures that the knowledge gained from each year is not lost.

4 MISSION-SPECIFIC AUXILIARY TOOLS

5 TESTING & VALIDATION

6 Logistics

7 Budget & Accounting