10 Results

10.1 Mechanics results

The previous group had developed and constructed the main hull. Since the main hull was complete it was mostly peripherals that needed to be created this year. For example the wings. The wings has been 3D-printed with attachments, such as LEDs to show state in the program as well as mountings hydrophones.

Also the entire tool plate needed to be redesigned. The tool plate was divided in to a front and back tool plate and are designed to be changeable in case other functionality was decried. The front tool plate has been constructed, it contains most of the equipment for the RoboSub competition. For example torpedoes and markers. The side scan sonar is also mounted in the front tool-plate. The back is at the moment an empty support structure where tools can be attached. The simple manipulator has not been finalised since the project run out of time.

10.2 Electronics results

The electronics group has continued the work from the previous year and added more functionality to the pre-existing cards. This added functionality have for the most part been by add-on cards to the exiting cards. A redesign of the MCU CAN card has also been done in order to get more out of the MCU itself. This new card can not at present time completely replace the cards developed last year but it is the belief of the group that this can be done with another redesign.

One of the functionalities that has been added is hydrophones to be able to hear a pinger used in the RoboSub competition. A Speed-logger to help determine position in the water. The previous group worked on a card to support the fibre optical gyroscope to help determine yaw position this work was finalised. RGB-LEDs have been added to the wings to communicate with the surface. A remote control to navigate though menus on the display when Naiad is on the surface has been implemented as well as a card to control the solenoids in the tool plate. Also a side scan sonar has been implemented in to the system.

10.3 Software results

Most of the software and protocols running in Naiad have been tested firmly, ~~by~~ observation over time ~~and~~ trying to break them. If an essential program failed, it has been prioritized until working as ~~supposed.~~ By focusing on robustness, a good base for future work has been built. A lot of work has been ~~done~~ to get a node based system running. With that working much time can be saved for testing new sub-programs since it is easy to add a new node. It also simplifies diagnostic to see what node is alive to take appropriate actions if a node goes down. This also helps for testing the robustness of that program. The PID-controller and path-planner have been tested in simulation and in real life, ~~both working good but need some tuning to work more optimal.~~ The simulator has been tested with orientation and translation with correct results. The graphical user interface is yet to be tested for sending missions to the robot, but the tests done so far shows good results. The communication part of the graphical user interface still need to be finished and implemented both in the GUI and in Naiad. The vision system has been tested with acceptable result for the purpose, a problem have been the lenses narrow visual angle causing it to easy loose sight of objects. The frequency of the program needs to be increased to work efficient enough. Most of the CAN-nodes works without any problems. The most common problems seems to be caused by SPI or UART, the time needed to firmly fix the firmware for these protocols has not been prioritized due to time issues and that the impact would not be essential.

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