**Unit Testing**

***UNIT TESTING****is a level of****software testing****where individual units/ components of a****software****are tested. ... A****unit****is the smallest testable part of any****software****. It usually has one or a few inputs and usually a single output. In procedural programming, a****unit****may be an individual program, function, procedure, etc. (google)*

**\*As agreed, in our whole software testing, the units are individual sensors.**

**Phase – I**

* **Accelerometer –** *Detects drop and triggers SDR.*
  + **Input –** Undefined
  + **Code –** Code it for USB plugin, with a return function.
  + **Output –** Boolean “True”
* **SDR** – *Determine unit vector and passes output to Motor control system.*
  + **Input** – Angel Beacon ping.
  + **Code** – Pass the unit vector and potential turning angle to the Motor control system. Turn on the TensorFlow
  + **Output –** Boolean “True” and “check if Tensor flow turned on”
* **Motor Control –** *Turn the boat and accelerate towards the given direction from SDR.*
  + **Input –** Unit Vector.
  + **Code –** Mathematical equation for the most efficient turn.
  + **Output –** Boolean “True” (Alignment achieved)

**Phase - II**

* **Ultrasonic Sensors –** *Detects collision with unidentified objects in the path.*
  + **Input –** Detects an object.
  + **Code –** Do not need to synchronize with other ultrasonic sensor, pass the output to motor control system. If there is collision happening both side = Stop
  + **Output –** Boolean “Left – True” or “right – True’ or “STOP”
* **Motor Control –** *Turn the boat and accelerate towards the given direction from ULTRASONIC SENSOR.*
  + **Input –** Direction.
  + **Code –** Mathematical equation for the most efficient turn.
  + **Output –** Boolean “True” (Alignment achieved)

**Phase - III**

* **TensorFlow –** *Detects/Find the astronaut and lock onto it for shortest aligned path.*
  + **Input –** SDR Code
  + **Code –** Turn off display and pass the direction to motor controls till the astronaut is in center front.*(Ultrasonic sensor is on)*
  + **Output –** Boolean “True – turned on” and “found target”.
* **Motor Control –** *Turn the boat and accelerate towards the given direction from TensorFlow.*
  + **Input –** Direction.
  + **Code –** Mathematical equation for the most efficient turn. Here maybe AMSAR will be in the radius of astronaut therefore not completing the turn properly hence ***Output 2.***
  + **Output1 –** Boolean “True” (Alignment achieved)
  + **Output2 –** “Interrupted”
* **Ultrasonic Sensor –** *To stop at a safe distance from astronaut.*
  + **Code –** Both sensor triggering for astronaut in center or (can have third sensor straight for better and safe stopping result). Switch off TensorFlow, Motor and SDR.
  + **Output –** Boolean “True”.
* **Health Monitor / Watch Dog**
  + All the outputs from individual unit/sensors can be checked in a loop to make sure the stability of the system.
  + Failure to return the expected output from the phase will trigger manual initiation to avoid system failure.