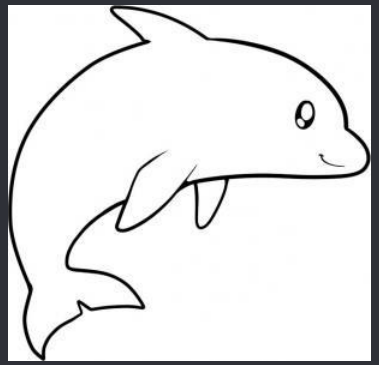
The Dolphin

Requirements & Test Plans



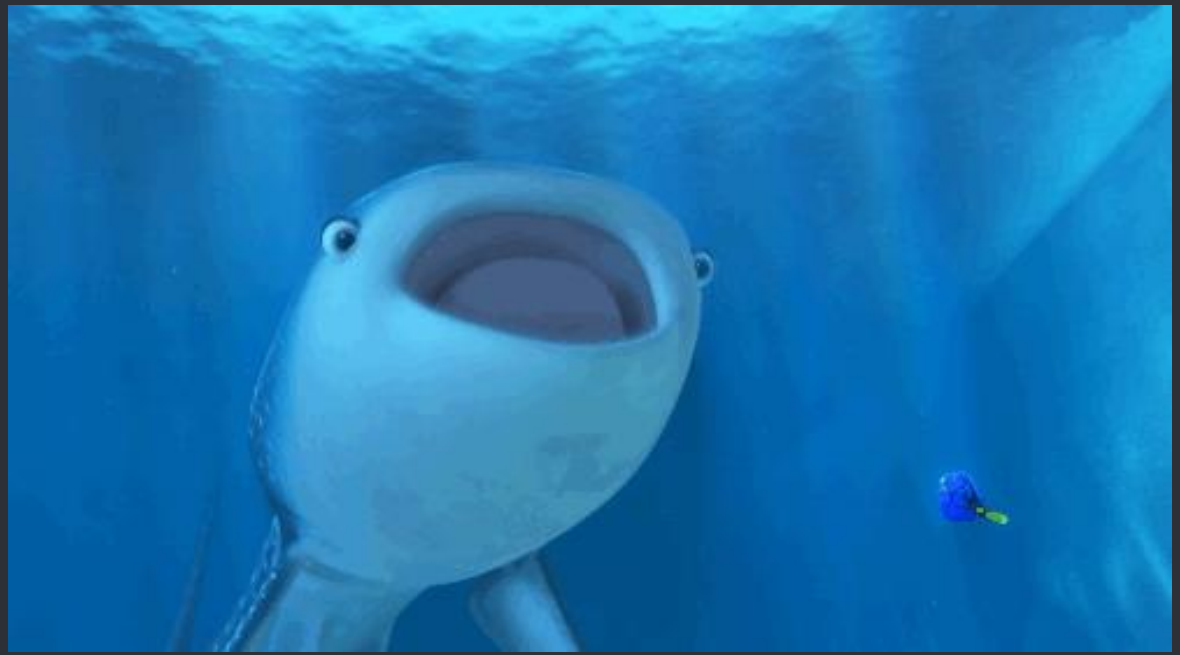
Group 18:
Kandayce Burks
Dieu Do
Luis Hernandez
Brent Yurek

What is The Dolphin?

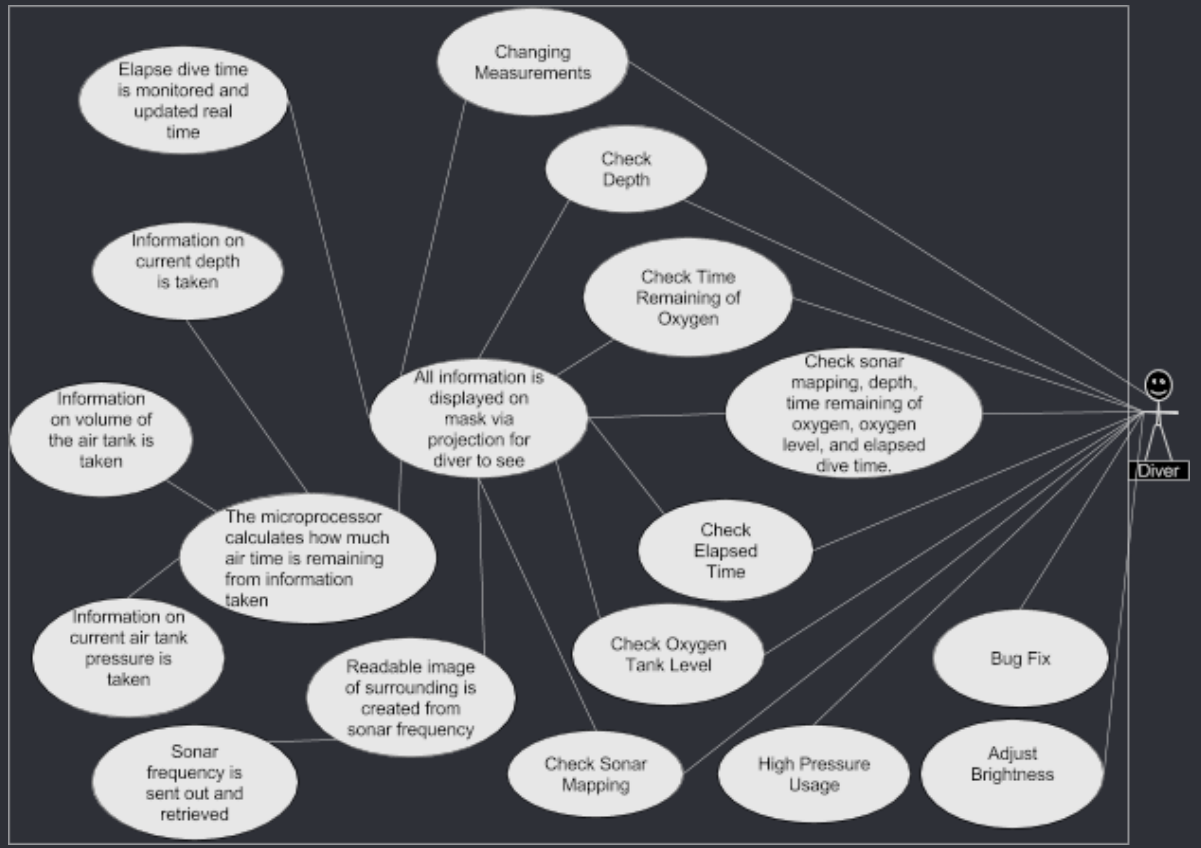
- Scuba mask
  - Full Face mask
  - HUD display

- Provides users with Vital information for diving
  - Air time remaining
  - Current depth
  - Dive time elapsed
  - Air tank pressure
- User will not have to manually calculate
  - Less human error
  - More precise

- Sonar Mapping
  - Provides sonar map of diver's surrounding
  - Real time
  - Up to 100 meter radius



Use Cases


Elapse dive time is monitored and updated real time
Changing Measurements
Check Depth
Information on current depth is taken
Check Time Remaining of Oxygen
Information on volume of the air tank is taken
All information is displayed on mask via projection for diver to see
Check sonar mapping, depth, time remaining of oxygen, oxygen level, and elapsed dive time.
Diver
The microprocessor calculates how much air time is remaining from information taken
Check Elapsed Time
Information on current air tank pressure is taken
Check Oxygen Tank Level
Bug Fix
Readable image of surrounding is created from sonar frequency
Sonar frequency is sent out and retrieved
Check Sonar Mapping
High Pressure Usage
Adjust Brightness

Requirements

Functional Requirements

- Measurements conversion
- Brightness adjustments
- Display Vitals
- Switch between sonars

Speed & Latency Requirements

- System cannot have considerable lag!
  - Calculations must be done in <.5 seconds
  - System response time after user's button press is 1.5 seconds
  - System retrieves sonar data every .5 seconds
    - Accurate sonar map in real time

Precision Requirements

- Remaining time before oxygen runs out calculation ± 1 minute
- Current time has to be ± .1 seconds from actual time

Safety-Critical Requirements

- HUD limitations
  - Must not take up more than 25% of screen
  - Information must be relevant and not distracting
  - Offer size adjustment for user preference
- Materials used must not be hazardous to users
- Must be able to function under high pressure
  - Withstand pressure levels of ~100+ meters of depth
  - IP69k certified

Usability Requirements

- Easy to understand
  - Users can pick up the product and learn how to use it within 15 minutes to 1 hour
  - Intuitive
  - Does not need extensive knowledge to use
- Users can set preferences
  - Metrics
  - Language

Test Plans

Features tested

- HUD projection
  - Is projection working? / is correct data being projected?
- Vital Calculations
  - Are calculations correct or within the 2% error margin?
- Sonar Mapping
  - Is the image correct? / is there an image created?
- Water Pressure
  - Can it withstand 100 meters? / does it meet IP69k standards?

Approach

- Stress test
  - Repeated test each function
- Test functionality at 100 meters depth
  - Perform tests at simulated environment that has same water pressure levels as 100 meters of depth
- Suspension
  - <30% functionality
- Resumption
  - >60% & <90% functionality

Test Cases

- Testing will be conducted once per week
- It will be done in water pressure levels of ~100 meters of depth
  - HUD responses
  - Displays correct calculations
  - Sonar imagery
  - Durability