

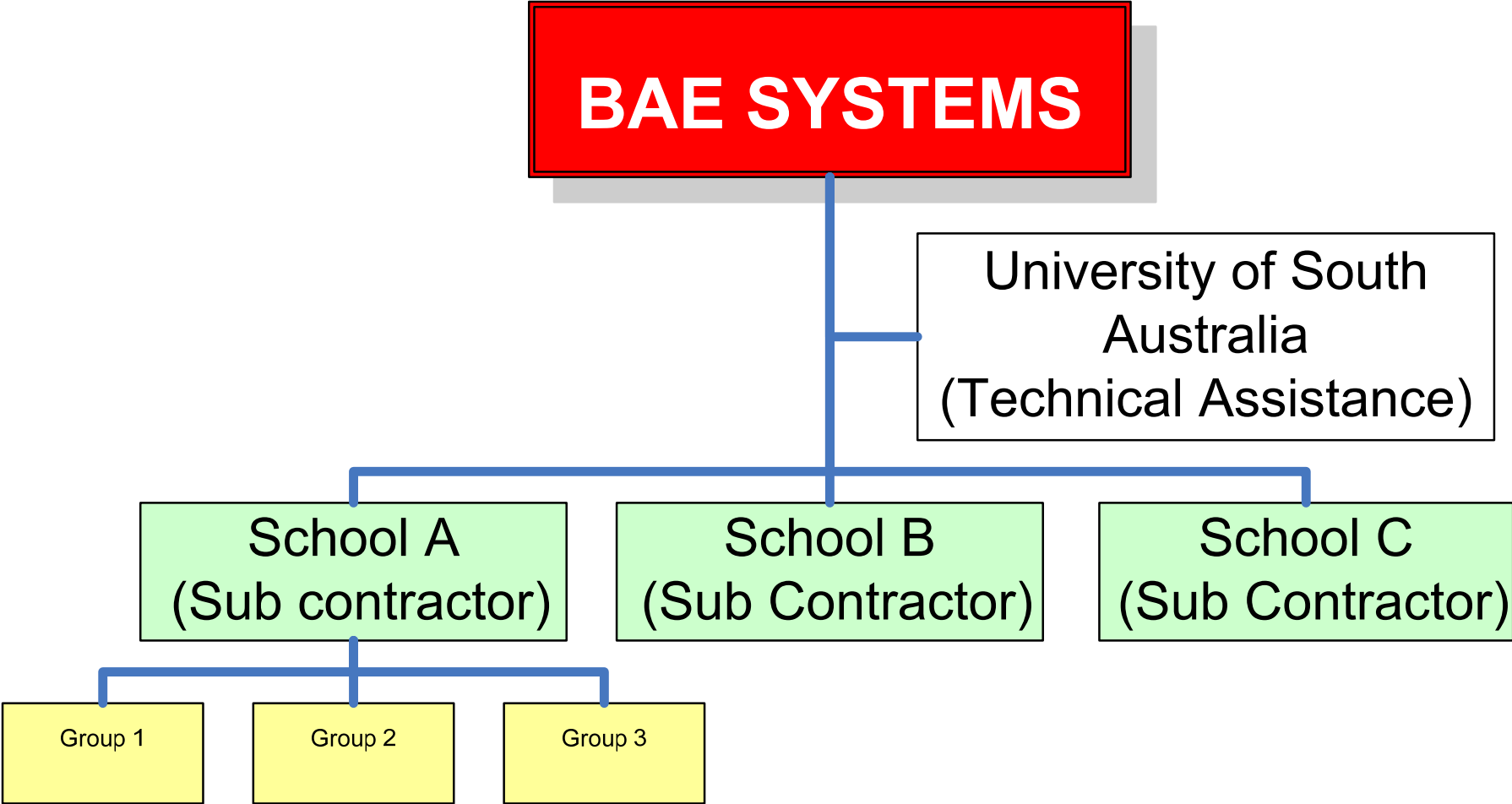
# BAE Systems C2C Project Specifications

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# Suburban **W**etlands **A**cquisition and **T**elemetry System **SWAT System**

# Roles of BAE Systems, University and Schools

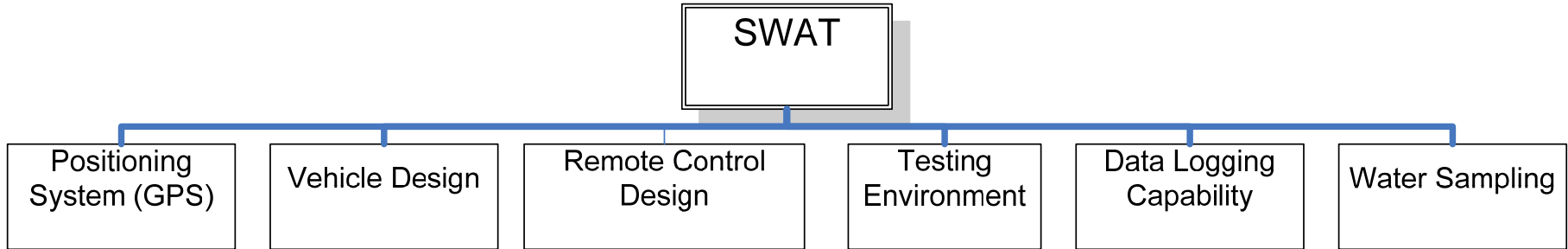


## Background

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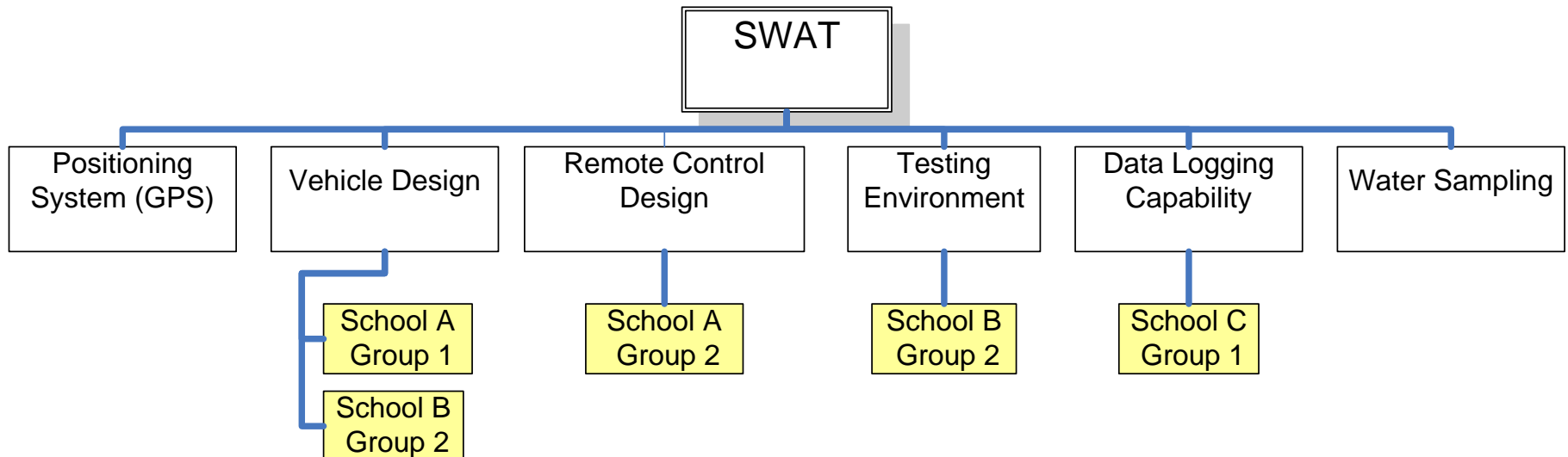
- Based around urban wetlands and monitoring water quality
- Consist of
  - A vehicle which can move to a location and sample water quality
  - A system to control the vehicle (remote control etc.)
  - A system to log the data collected (computer program, data logger etc.)
  - A system to present the data (PC using excel or other program)
  - A system to test the vehicle and data collected (a test environment with known samples of water to test the sensors, a track to test the movement of the vehicle etc.)
  - A system to sample the water quality (salinity, pH etc.)
  - A positioning system so you know where the vehicle is (GPS)

# Breakdown of the project



## What do the schools do?

- Each school and group can choose to focus on any particular part of the SWAT
- Within this initial breakdown there are still many smaller sub projects
- Each school will have to do some Systems Engineering on the problem to work out what the smaller projects are and what their requirements are



## How do the schools do it?

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- This challenge is non prescriptive
- Each school can address the problem by what ever means they determine are the best
- Each school will have to perform some Systems Engineering to help breakdown the problem into smaller components
- The University of South Australia (Uni SA) has a number of people who can help schools with the Systems Engineering and with technical advise of how best to tackle problems
- If you have any questions about the project ask either Uni SA people for technical support or if it is around requirements then contact BAE Systems representatives
- You are not alone - ask for assistance

## So what if I don't know how to do this?

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- Don't be scared that you don't know the answer to a problem - this is very common in engineering
- All it means is you will need to research to find the answer or answers
- BAE Systems and Uni SA will not provide you with the answer
- We will just guide you down the path and show you options
- Each school must find it themselves

## What will the schools deliver?

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- Mid way through the project we expect the schools to conduct a Preliminary Design Review (PDR)
- A PDR is a presentation of what work and progress you have made towards your selected components
- The PDR will allow us to see the schools progress and advise and guide them on how we want the final product to perform
- At the end of the year the schools will deliver a Critical Design Review (CDR) which will be the C2C Expo where you will present what you have designed and built as a prototype

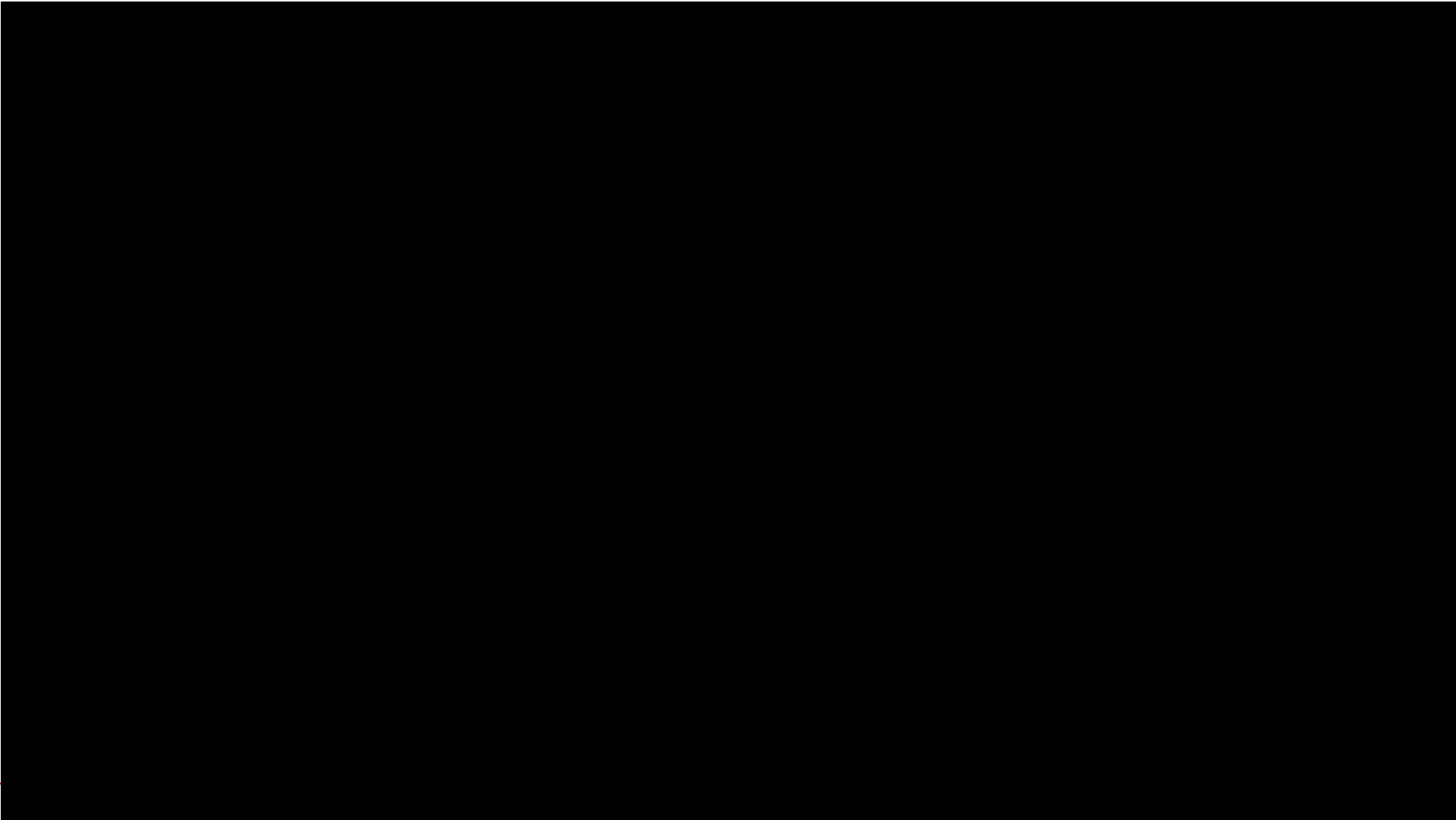
## Beyond 2011

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- The intention is that each school will not build a perfect solution in the first year
- In future years we would hope that schools will continue the challenge and pick up from where last years group left off and take it further
- Ideally we would like to be able to take the best designs from all of the schools and build a working SWAT

# Vehicle Control Challenge

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## The Vehicle Controller

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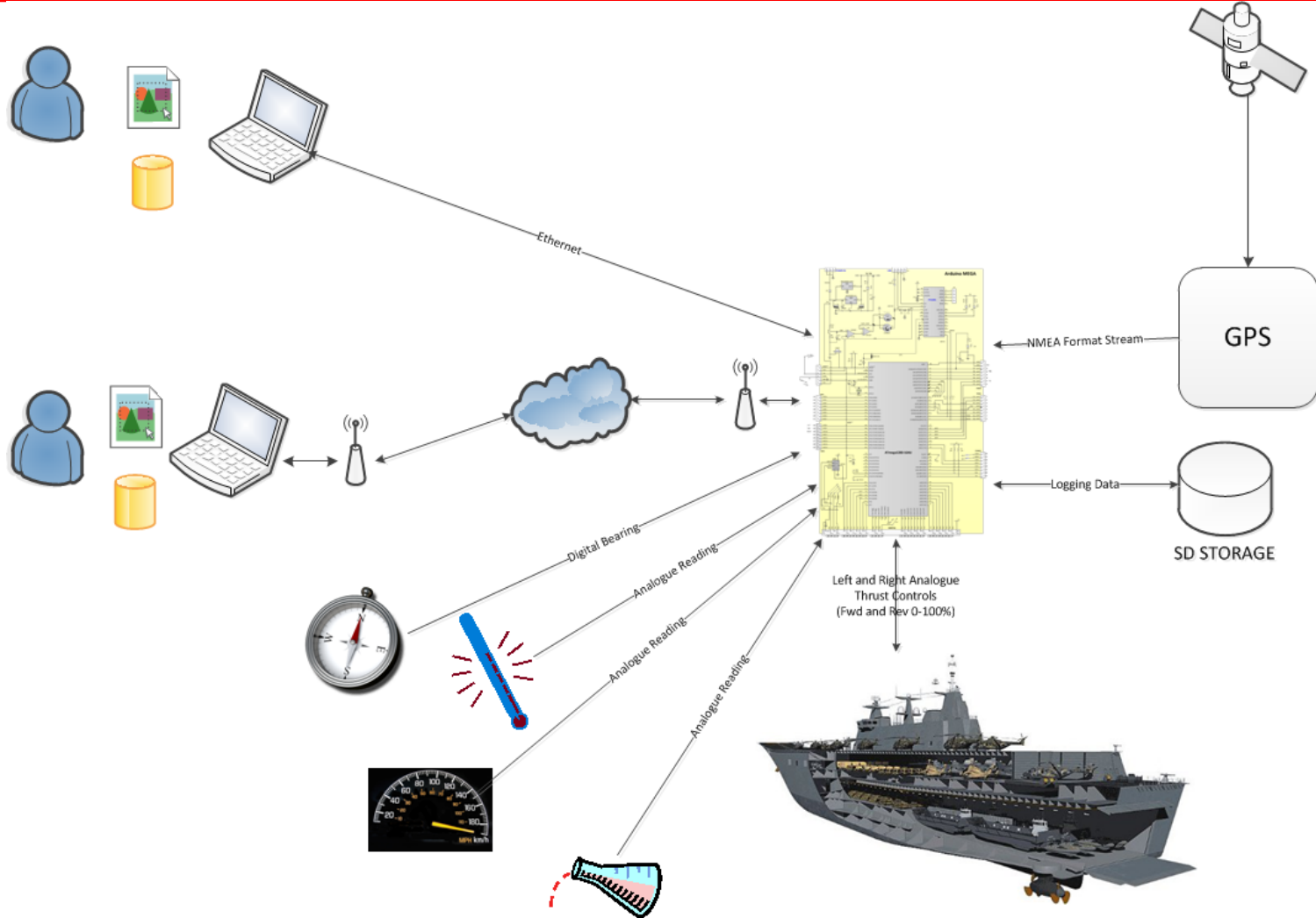
- BAE Systems in partnership with UNISA is developing a COTS board which can be connected to any vehicle.
  - GPS Builtin
  - Digital Compass
  - Wireless wifi
  - Digital and Analogue inputs and outputs
  - Motor Controller
- By connecting to a port on a PC a user can control the outputs and receive data on the inputs via the wifi connection

## The Vehicle Controller

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- Can be used on any vehicle
  - Boat
  - Hovercraft
  - Car
- Can plug in your own sensors

# Concept



# Feedback Controller Challenge

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Custom Software developed by BAE System

- Vehicle Mapper and Simulator
- Takes the input from the Vehicle Controller
- OR
- Simulates the vehicle
  
- Designed to allow student to develop software to move a vehicle around an obstacle course using the vehicles position and direction as inputs
- Challenge is to design the software feedback algorithm using the simulator and then test it against the real hardware.
- We will develop an obstacle course and the teams with the fastest times will win the challenge.