

# Mariokart

## An autonomous go-kart

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# Overview

## The Original Goal

- Make department go-kart drive autonomously
- Select actuators, motion and distance sensors
- Development of a navigation system
- Interface to the existing control system
- Have go-kart drive itself around university

## Our Goal

- Sub-goal of drive-by-wire go-kart
- Make a robust platform for future projects

# The Go-Kart



# Hardware Layout

## PCBs

Block diagram of PCB

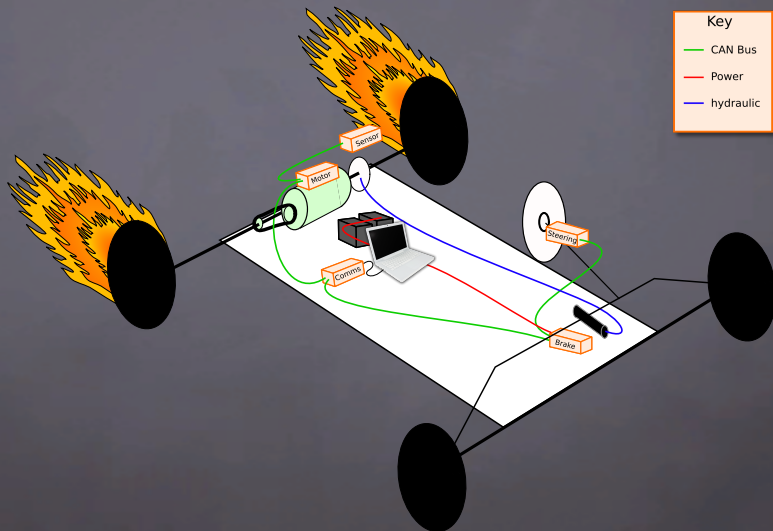
# Hardware Layout

PCB Block Diagram

Block diagram of PCB

# Hardware Layout

Whole kart



# How it all communicates

## Comms

### CAN Bus

- Inter-Board Communications
- Expandable if someone wants to add more nodes

### USART

- Two on each Board
- One used for debugging

### SPI

- Two on each Board
- One 5v level logic

### USB

- Fast communication with computer

# Conclusion

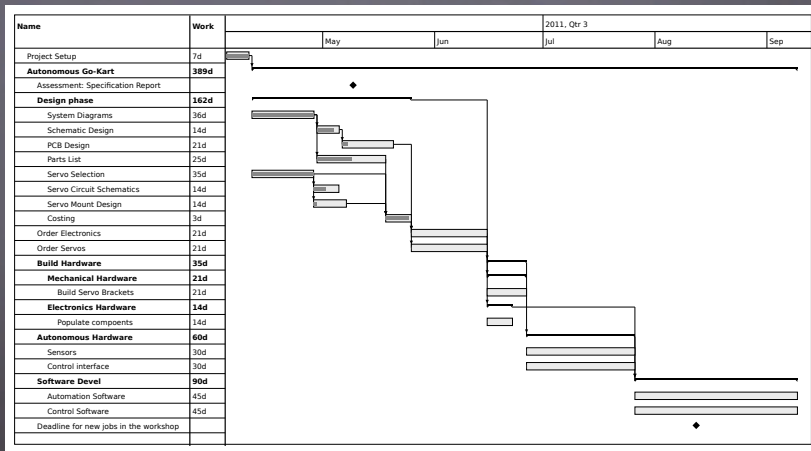
The end...

- All Hardware working
  - ▶ Only 3 minor mistakes on Boards
  - ▶ Nice hardware platform for future years
- Project almost stuck to time plan
  - ▶ Although we cut the goal down, we came close to achieving our stepping stone goal.
- Project well documented
  - ▶ Wiki for documentation
  - ▶ Group coding standard adhered to
- Most of all
  - ▶ I learnt a lot
  - ▶ Had a heap of fun





# Project time line



# Why use Atmel SAM7s

- Required Peripherals
  - CAN Controller
  - USB
- Familiarity
  - Have used SAM7s before
  - Large Library for Atmel
- Expansibile
  - Spare GPIO
  - Can do some signal processing

# Board Design

Dreaming about Altium

1. Select major components
  - ▶ MCU
  - ▶ Voltage regulators
  - ▶ etc..
2. Select headers and connectors
3. layout schematics
  - ▶ Use sheets to modularise!
4. Connect sheets
5. Layout schematics

