



2020

ASSESSMENT 3: OUR IT PROJECT

ColourTech Computerised Accelerator Safety
Device

Abstract

Project by ColourTECH on the development of the Computerised Accelerator Safety Device (CASD) to improve vehicle safety by limiting the speed of the vehicle to the posted speed limit

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LISHMAN: S3829198, TEGAN O'NEILL: S3831038, & LORI
WILLIAMS: S3824209

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Team Profile

Team Name

ColourTECH

Personal Information

Joshua

My name is Joshua Lishman, I am 21 years old and my student number is s3829198. I am half British, on my father's side and half Australian, on my mother's side. My highest level of completed education is Year 12 but I also have completed a Certificate III in Information Technology and one and a half years of a Bachelor of Business before moving into my current study of IT. I can speak some Indonesian from multiple years of study through primary and into high school. I played rugby league for many years, from under 7s all the way to under 15s where I had my leg broken in a tackle and couldn't play again, but I still follow it closely when I can and still to this day wish I could get back out on that field for another game.

My Personal Profile

<https://joshualishman.github.io/My-Profile/>

Kevin

My name is Kevin Brown, I am 49 years old and my student ID s3831353. I am a qualified baker by trade however I developed an allergy to flour later in life. I started managing small retail chains and developing my career in management. I have three beautiful kids, and when my son was born, I had to take a break from my career and look after him as he used to wake 30 times a night. Finally, when he was one and a half years old, I was able to land a job as a casual orderly, and I have worked my way up to a senior orderly. As a senior orderly I meet a lot of people at the worst time of their lives and some of the best times of their lives, and it makes you look at your life in a whole new light. From a young age I have been interested in computers and have built a few of my own and helped out family and friends, I am a pc gamer and my first computer was an IBM and ever since have been interested in learning to program but never had the courage to pursue a career in IT till now.

My Personal Profile

<https://chillie1970.github.io/Assessment1/>

Lori

Hi there, my name is Lori and I'm 22, Student ID s3824209. I worked at a telco in the small but closely-knit team of the billing department. I would get called upon sometimes by others for any IT issues as our main IT department was moved off-site. Hoping to complete this bridging course and degree so I can move into a career centred around cyber security. My hobbies include videogames, reading, Diamond Paint art, music, Formula 1 and working on my make-up skills.

My Personal Profile

<https://gopnikqueen.github.io/ITT-Assignment-1/>

Lynette

S3728067

I have a background in accounting, finance and retail management, but have always been the one to fix any IT problems at work and for friends. I did a small amount of IT studies 20 years ago and have since studied in the accounting/finance area but after doing half a Bachelor of Accounting have decided that my interest in IT is where my future lies so I am in the process of changing degrees. Some of my hobbies include Netball, Basketball, Hiking and gaming on the Xbox, having hobbies my children are also involved in makes it easier to spend time together.

My Personal Profile

<https://lynetteSofs8.github.io/IntroIT/>

Tegan

Name: Tegan, student number: S3831038. I was born in Australia to Australian parents and have completed certificates II to IV in Information Technology. Due to my health, I enjoy low impact activities with my hobbies including sewing and PC gaming. My health is also the reason I changed career paths from hospitality to IT. I have worked as in-house IT at a local not-for-profit with my key roles including network admin, end-user support and IT maintenance.

My Personal Profile

https://tegano-au.github.io/IIT_A1/

William

William has not made any contact with the team since before the submission of our previous assessment, so we have worked without his input this time.

Group Processes

While our group is largely introverted with vastly different personalities, the team worked very well together. We separated the assignment into individual tasks as equally as possible. While each of the tasks were done excellently and on time, there was an issue with the natural disaster occurring during the assignment which caused a small delay with a task being submitted that ultimately lost marks as we only had time to ask the questions that was in the assignment instead of being able to add our own to the mix. Overall, the team was very happy with the results as we were able to walk away with a High Distinction, even with the issues that occurred partway through. We will take this confidence in stride through to the next assignments to come.

We also lost contact with William a few weeks into the previous assignment and have not heard from him at all since. We therefore have had to do this assignment without him. It is disappointing to be without one of our team, and the rest of the group have banded together to pick up the tasks that were initially selected for William to complete.

Career Plans

Since assignment 1 and 2, there hasn't been a massive change in ideal jobs and career paths. There are still a lot of similarities in our ideal jobs especially Data Engineer, Software Engineer and Full Stack Web Developer; These positions require the principles of computer software to design and develop computer software, with a full stack developer also needing to know more front-end technology. A Cyber Security (Malware) Analyst also needs to know C & C++ like the above position to provide access to IT infrastructure such as system processes. The big difference in Cyber Security to other positions is that it is more about monitoring and analysing existing systems and protection of sensitive information.

The position of Systems Assembler is the only position within the group that revolves around the hardware of a computer rather than the software, with a thorough understanding of how the different hardware components will meet a customer's needs. This position does require good problem-solving skills which is also required for the other positions.

We all seem to have the analytical, logical parts of the industry at the forefront of our aspirations, though this appears to come with the territory, as people with our personality types (introverted, thinking, neurotic types) seem to be drawn to an industry where it is possible to spend a lot of your time in a room making things work without speaking face-to-face with actual human beings.

Tools

Group Website

<https://tegano-au.github.io/IIT-A3/>

Group Git Repository

<https://github.com/TeganO-au/IIT-A3>

With this assessment, we made some changes in the way we used our tools. This time around we did use GitHub to do most of the written work, but mostly used text and syntactically abhorrent html files as they were simplest to work with using a docx file for the final product where just one person added to and edited it to maintain formatting and continuity. the audit trail in this case shows a lot of commits from Tegan and fewer from everyone else, but as Tegan was the editor, there were a lot of smaller changes in different areas whereas everyone else was mostly adding complete sections. Overall, the audit trail was a much better reflection of the group's work than for the previous assessment.

Project Plan

Overview

Topic

We are developing a device called the computer acceleration safety device (CASD), which is designed to aid the driver of a vehicle in remaining under the posted speed limit by limiting the vehicle's speed based on geolocation and/or localised transmitters. It will also be able to adjust the limit according to road conditions such as accidents or road works notifying the driver of the change.

Potential outcomes for the population are a decrease in the number of deaths on our roads which will mean decreased costs in areas such as emergency services, insurance, road maintenance and vehicle maintenance. Further, costs to society itself will be reduced as services such as ambulance, police, hospital staff, clean-up crews and maintenance crews will be less stretched and therefore better able to direct their attentions.

Motivation

In 1901 speed limits were introduced to Australia in an effort to increase safety on our roads and reduce crashes, then the speed camera was introduced in 1961 with a radar device used to catch people speeding (Davis, 2014), as you can see from table below in the last 24 months 2,431 people have been in crashes relating to speeding, and in 2019 there were 4.7% more deaths on Australia roads than the same period as 2018 (NSW Government Transport for NSW Centre for Road Safety, 2020). The CASD is going to save lives, reduce the number of crashes on our roads and make a difference in people's lives.

Serious injuries crash data - June 2019 quarter

Behaviour Factors	12 months ending June 2019	12 Months ending June 2018
Alcohol involved in crash	335	362
Speeding involved in crash	1179	1252
Fatigue involved in crash	629	644

Data sample from (NSW Government Transport for NSW Centre for Road Safety, 2020)

Overall the CASD s will be controversial because it could potentially change laws for car owners and their rights and responsibilities regarding driving their cars. This system will also reduce the resources needed by the government to regulate drivers' adherence to speed limits. I know firsthand from working in a hospital as an orderly than the devastation that high-speed crashes not only from the victims but the family themselves not only physically, but mentally.

The application of technologies for vehicle safety are increasing exponentially with devices such as lane keeping assist systems which can detect unintentional lane departure and guide the vehicle back into the correct lane (Drive, 2019), Forward Collision Avoidance Systems which detect and react to potential head-on collisions (Queensland Government Department of Transport and Main Roads, 2017) and car breathalysers which prevent driving under the influence of alcohol. The CASD is an opportunity to introduce another aspect of vehicle safety to our roads and could be developed as an IoT device connecting you with the surrounding road conditions to optimise speed and safety.

Over the course of the next couple of years, our team would like to have gained the knowledge and experience to have least created and designed a working prototype of our device, along with the skills and team behind us to make it become a reality. This will demonstrate that our team has a vision and a passion for what we do. The group will demonstrate initiative, teamwork, vision, safety consciousness and of course a wealth of IT skills.

Landscape

There are speed limiters out there that reduce the car overall speed of the motor vehicle example of this are Australia trucks are limited to 100kms an hour, these are call governors. There are different types out there such as mechanical, pneumatic and hydraulic governors (Anon., n.d.). Also, the Electronic Speed Governor which is micro-control base (Anon., n.d.)but these governors don't take into consideration the variety of speed limits changes. Self-driving cars use radar, sensors, GPS, sonar and lidar to take in their surroundings to ensure they keep in the guidelines of the road rules (Tung, n.d.).

Competition in this field are companies and organisations such as Tesla, Wymo, GM Cruise, Argo Ai, Mercedes-Benz, General Motors, Continental Automotive Systems, Autoliv Inc., Bosch, Nissan, Toyota, Audi, Volvo, Vislab from University of Parma, Oxford University and Google. But what these companies all have in common is their focus on driverless cars; the CASD is designed for vehicles with drivers, assisting them to maintain safety by adhering to the posted speed limit.

Detailed Description

Aims

Aim

Develop a device which limits the speed of a vehicle based on transmissions and/or geolocation

Goals

1. Produce devices that can transmit and receive a speed limit value for a location/area
 - a. Develop transmitter
 - b. Develop receiving device
2. Develop area speed limits (access accurate maps with speed limits??)
 - a. Within city limits
 - b. Outside city limits
 - c. School zones
 - d. Residential areas
3. Develop systems to communicate speed limits to vehicles
4. Interface with vehicles
5. Testing
6. Roll out

Plans and progress

The purpose of this project is to develop a device to improve road safety by limiting the speed of a vehicle according to the speed limit by geolocation or by using localised transmitters. The device called Computerised Accelerator Safety Device (CASD) is intended to be rolled out in phases beginning with some mandatory installations for the vehicles of repeat offenders and optional installations for those who feel they need it. The transmitters and speed zones would be a project on its own, although worked on simultaneously.

Planning

Planning and management will be important for the continuity and effectiveness of the project. While a lot of this will be done at the beginning, various stages of planning will be necessary as the designs evolve and as public and government response come into play. The initial planning is outlined in this document.

Familiarisation with tools and tech

The team need to become familiar with the tools and technology that will be used throughout the project including the simulation software, the electronics (Arduino for prototyping), the Engine Control Units (ECUs) of the vehicle that will be interfaced. While this is a basic thing, it needs to be accounted for in this case as there are several complex systems involved

Familiarisation laws and regulations

Laws and regulation in the states and territories involve will have a very large impact in how this project turns out. There are regulations around adapting vehicles and installing devices and in the future, we intend for this device to be a mandatory component in vehicles that are built in the future, and even retrofitted to vehicles of repeat offenders.

Research vehicles

As there are so many different vehicle models, each with their own specific ECU, the initial phase of this project will involve key vehicles – the most common vehicles in the various states and territories of Australia and those most involved in speed-related accidents. Research into the statistics in this area will need to be carried out thoroughly prior to the development of the interfacing units. Once the key vehicle models have been selected, research and testing will need to be carried out to determine the best way to interface with each ECU.

Develop Receiver Unit

There are several components to the CASD; the receiver unit which will be universal in each of the devices will include a GPS unit, a receiver for override limits, and as an IoT device, a cellular component to communicate emergencies and updates and a computer to process the data and output information as needed. The first step in the development of the unit will be to develop the program wireframe.

<https://github.com/TeganO-au/IIT-A3/blob/master/FILES%20and%20Info/ArtifactMVP.java>

<https://github.com/TeganO-au/IIT-A3/blob/master/FILES%20and%20Info/Constructor.java>

The second step for the receiver unit will be to simulate the device on an electronics simulator such as TinkerCAD before using Arduino and any other necessary components to prototype and test the unit.

Develop Transmitter

Transmitters which will be installed on the roads will be developed to indicate to the CASDs that there is a temporary speed limit in place. This will be to allow for road works, school zones and special events to be accounted for. These units will be designed and developed in conjunction with the receiver units to allow for testing and compatibility.

Develop Map Program

A map program will need to be designed, ideally utilising existing programs to determine the speed limit on each road. This will need to communicate the correct speed limit based on the GPS location of the receiver unit. It will need to be determined if this program will be installed on the device itself or on a central server based on capacities for communication capacity storage and updates.

Develop Interface Unit

The interface units will be specific to each model of vehicle as there are various differences between how each of the ECUs and the parts of the vehicles work and older vehicles don't have computers at all, so may need to utilise mechanical methods to limit speed. The interface unit will process information output by the receiver unit and direct the ECU to limit the speed of the vehicle and indicate the limit to the driver via a dash display. It may also transmit emergency information to the receiver unit if an emergency override is activated.

Test prototype in vehicle in various locations

Testing will occur throughout the entire process, but the key items to be tested will be the output of the current speed based on the GPS location and the map system, the communication from the receiver unit to the ECU via the interface unit, the response of the vehicles to the communications, emergency effectiveness, tamper-proofing and the general safety of all components.

Develop manufacture plan

Once all the components have been developed, prototyped and tested, a manufacturing plan will need to be developed. There will be many stages to this, including developing circuit diagrams, PCB circuit designs, cabling and other assembly designs, researching and comparing manufacturers.

Documentation

Clear documentation will be developed for the safe use, installation and maintenance of the devices, as well as internal documentation for the production and programming of the components.

Campaign for Funding and Incentive

There may be the necessity to have government incentive to get as many people as possible to install this device in their vehicles. In this case there would need to be a campaign to gain such funding by promoting the benefit to personal safety, and reduced costs in emergency response and police governance.

Approval and Accreditation

If the device is to become mandatory for any situations, it will need to become an approved device. And work will need to be completed to have service providers accredited.

Advertising campaign – work with government/Motor Vehicle groups.

Advertising and marketing will need to be conducted to gain adopters of the device as well as accredited service providers. In our minds the device's benefits outweigh the costs, however the general population may need convincing. There will also need to be way for people to learn if a compatible device has been developed for their vehicle, ideally through a website.

Maintenance

A maintenance plan will be developed to define how often the installed devices need to be serviced, checked for tampering, updating or replacing.

Roles

Program Developer - Lori

The person responsible for developing the software that will determine the speed limit on the current road and indicate this speed limit to the vehicle

Vehicle Interface Designer - Joshua

This person will be responsible for developing the interface designs for the CASDs connections to different vehicles

Hardware designer - Lynette

This person will be responsible for designing the hardware of the CASD working with the Program developer and Vehicle interface designer to produce the device

Project manager - Tegan

The project manager will be responsible for coordinating personnel, managing the budget and funding, handling project creep to make sure milestones are met on time, and much more.

Research Leader - Kevin

This person is responsible for obtaining information and data pertinent to the project. Safety information, laws and regulations, patents and copyright and so much more are needed to produce a device such as the CASD to the highest standard without infringing upon any legal element.

Scope and limits

Time being the biggest limiting factor for this project, an ideal deliverable would be a prototype of the CASD that can demonstrate its determining and outputting of the speed limit in the area. Development of interfacing with key vehicle models (3 at most in the existing scope), along with the collection of data including laws and regulations around modifying vehicles in such a way would also be necessary for the future of the endeavour.

Tools and technologies

There are several things to consider when determining the required tools and technologies, from the native language of vehicles' Engine Control Units (ECUs), to the hardware for prototyping the CASD and the programming language used there. The product will need to be planned before specific components are purchased, so a virtual version of the hardware should be used.

Vehicles' ECUs (Engine Control Units) are predominantly programmed in the C language, specifically using MISRA C (Embedded Staff, 2002), guidelines named for the Motor Industry Software Reliability Association who have developed them to prevent "bad" code and to facilitate compatibility, performance and reliability in safety-critical systems.

The hardware in the project will be Arduino technology for prototyping. These can be purchased from electronic shops like Jaycar or the Arduino product page (Arduino, 2020). The usage of this hardware will not need any licences as the developers of Arduino promote open source development and usage. Arduino has its own IDE, currently ARDUINO 1.8.11 (Arduino, n.d.) and uses a set of C/C++ functions which can be called to direct the hardware. Once the device is prototyped using Arduino, we will be able to submit the design to an electronics manufacturer for production. Arduino can be simulated in a variety of ways including Autodesk Tinkercad (TinkerCAD, n.d.), Virtonics Simulator for Arduino v1.11 (Virtronics, n.d.) or Proteus (Proteus, 2020). Simulation is the ideal way to test and adjust designs without spending time and money putting together different physical components.

The program needs to be written in an IDE (Integrated Development Environment) and in this case the current version of Microsoft Visual Studio 2019, being v16.4.3, would be optimal for its added support and flexibility.

Familiarity with the components and the Arduino functions (Arduino, n.d.) and other language specifics will take roughly a month. This can be made easier with the use of the multiple tutorials available on YouTube and Arduinos website making it very possible to become familiar and functional with Arduinos in a matter of a couple of weeks meaning a basic prototype would be possible by the very end of this project timeline.

Testing

There will be several stages of testing involved in this project with various adjustments in between. The first stage will be using the simulator testing to see the device can input the geolocation and output the correct speed limit. Next, we will need to put together a prototype using Arduino components and test similarly to the simulation. Meanwhile we will need to test different interfacing devices which can communicate input the speed limit and prevent the vehicle from going over this limit. This will be the most complex as there will need to be many different interfaces for all the different vehicle models, although this will be done in stages.

Timeframe

Week	Programmer	Hardware Developer	Interface Developer	Researcher	Project Manager
Week 1	Project overview, familiarisation, discussion, etc.				
Week 2					
Week 3	Familiarisation with simulation software and Arduino Programming	Familiarisation with simulation software and Arduino components	Research and determine most appropriate vehicles for proof of concept		
Week 4	Familiarisation with Arduino programming	Familiarisation with Arduino components	determine most appropriate vehicles for proof of concept		
Week 5	Develop device MVP		Familiarisation with the ECUs of the selected vehicles	Work with the rest of the team as needed collecting and compiling information	Develop documentation and manage timeframe and other project risks
Week 6	produce and test device simulation		Familiarisation with simulation software		
Week 7	Produce and test device prototype		Familiarisation with the ECUs of the selected vehicles		
Week 8			Begin wireframe of interface unit		
Week 9					
Week 10	Develop MVP for interface unit				
Week 11	Produce and test simulation				
Week 12					
Week 13	Produce and test prototype				
Week 14					
Week 15					
Week 16	Prepare for Demonstration				

Risks

As with any project, there are going to be a few risks. In the case of this project, a few of the risks are going to be significant and others, far more manageable.

Skills

There are some very specific skills and knowledge needed for this project to be completed including auto-electrical engineering, mechanical engineering, electronics production, programming, public relations and law. These skills are not insignificant, and we will need to seek experienced people to join our team and meet the needs of the project and allow time and resources for the other team members to learn enough to work productively.

Tools

Each programmer has their preferred tools to use when working and it is important that we allow as much as possible for people to work with tools with which they are comfortable, but we must make sure that the tools used meet the needs of the project, and are compatible with the other tools being used.

Technologies

There will be a few technologies such as GPS and cellular interfaces, that already exist and are able to be utilised and adapted in the development of the CASD, however some components especially in the interface unit with need to be developed specifically for the device.

Other risks related to the future implementation of the device include not getting authorized for use, tampering, cast to the driver and incidents involving driver safety.

Group processes and communications

Our group primarily uses Microsoft Teams for all communication which includes meetings that occur every Thursday and Sunday at 8pm AEDT, any small or large updates, issues etc. We also use discord as a backup in case MS Teams is down or a teammate is not responding. For any formal communication, generally the whole team and teacher are notified, is done via Microsoft Outlook email. There have been a few times where the team has been involved in an email to the teacher regarding a teammate not responding and regarding assignments where a teammate cannot participate fully due to personal reasons/safety concerns due to natural disasters. Sadly, we've had to conclude to remove a teammate from our team due to lack of any communication despite numerous attempts to reach him.

Skills and Jobs

JOB DESCRIPTION 1

TITLE: Public Relations Manager

TEAM: Public Relations

REPORTS TO: Project Manager

OVERVIEW:

At ColourTech, we are looking at making the roads of Australia a safer place for both motorists and pedestrians with our new speed limiting technology. With the lives of loved ones and friends of all Australians at the forefront of our minds, we aim to deliver a well optimised, public supported and government trusted product to be adopted by Australia and aims for the global market.

OBJECTIVE:

The purpose of this position is to bridge the gap between the public and our company, creating a synergy for our company to grow, listen to and possibly implement new ideas given to us by the public. We also want to this position to be accepting and understanding of public criticism as we understand the safety of loved ones and friends is a very important topic in which we are more than willing to listen to.

The Public Relations Manager will be responsible for facilitating the company's goals. This will be achieved by –

- Regularly reaching out to the public for feedback
- Overseeing any further public relation employees
- Notifying superiors of any plausible ideas or heavy criticism
- Keeping a strong business government relationship
- Updating superiors on law changes or any other relevant information

RESPONSIBILITIES AND DUTIES:

- Managing a positive and effective public relations team
 - Training, mentoring, positively reinforce, assist and guide public relation employees
 - Keep a motivated and diverse team
 - Making other voices heard
- Keeping public, business and government in the loop
 - Develop relevant public relation communication plans
 - Reach out to different members for growth ideas
 - Effectively communicating company growth and future goals
- Attempt to gain government support where possible
 - Identifying current market situation with public opinion
 - Finding gaps or developments in the relevant market
 - Exploiting these gaps with evolving public relation communication plans

QUALIFICATIONS:

Level of Education

- University degree in public relations or similar equivalent qualification

Knowledge/Skills

- Fluent in the English language
- Previous job placement or internship in similar or lower public relation position
- High level communication skills
- Knowledge of social media communication and implementation of this fact
- Appropriate plan development skills
- Team leadership skills

Personal Qualities

- Understanding and patience with others
- One to take initiative
- Willingness to teach and positively reinforce subordinates
- Positive and outgoing personality
- Accepting of all others with extremely high professionalism
- Wanting to be a part of something bigger

JOB DESCRIPTION 2

JOB TITLE: Development and Documentation Officer

JOB TYPE: Full-Time

OVERVIEW

At ColourTech, we are looking at making the roads of Australia a safer place for both motorists and pedestrians with our new speed limiting technology. With the lives of loved ones and friends of all Australians at the forefront of our minds, we aim to deliver a well optimised, public supported and government trusted product to be adopted by Australia and aims for the global market.

OBJECTIVE

The purpose of this position is to produce documentation for the CASD in usage, installation, maintenance and troubleshooting. It is important that products produced by ColourTech are of the highest standard which include professional user-friendly documentation. In order to meet this need, the team member will need to be involved in the development of the device in order to gain the best understanding of how it works.

The Development and Documentation Officer will be responsible for facilitating the company's goals. This will be achieved by:

- Working closely with other members of staff to ensure the project stays on track and systems flawlessly integrated.
- Dealing with clients, suppliers and other employees professionally at all times
- Ensuring their workspace is always clean and presentable

REPORTS TO: Lead Developer

MAIN DUTIES/RESPONSIBILITIES:

- Ongoing improvement to systems by addressing feedback and problem solving any issues.
- Provide written guides for installation and usage
- Installing and developing updates where required

SKILLS & EXPERIENCE

Qualifications:

- Qualifications in Computer Science or relevant technical discipline or equivalent practical experience

Experience:

- At least 3 years programming experience in C++, working with opensource hardware devices
- Some experience in the motor vehicle industry
- Job placement of internship in similar or lower engineering position

Skills:

- Genuine interest in solving complex problems and providing workable solutions
- Ability to visualize processes
- Excellent verbal and written communication
- Strong project management skills
- A high-level of teamwork and communications skills.

JOB DESCRIPTION 3

JOB TITLE: Product Engineer

JOB TYPE: Full-Time

REPORTS TO: Any of the 6 founding members

OVERVIEW

At ColourTech, we are looking at making the roads of Australia a safer place for both motorists and pedestrians with our new speed limiting technology. With the lives of loved ones and friends of all Australians at the forefront of our minds, we aim to deliver a well optimised, public supported and government trusted product to be adopted by Australia and aims for the global market.

OBJECTIVE

The purpose of this position is to develop and produce high quality hardware for the Computerised Accelerator Safety Device which is designed by ColourTECH. This position must be able to work well withing the team to continuously improve the product and maintain the standards expected of a ColourTech product.

The Product Engineer will be responsible for facilitating the company's goals. This will be achieved by:

- Working closely with other members of staff to ensure the project stays on track and systems flawlessly integrated
- Working with clients, suppliers and other employees professionally at all times
- Ensuring their workspace is always clean and presentable

MAIN DUTIES/RESPONSIBILITIES:

- Lead and develop plans and production of design for new product
- Review production process to ensure feasibility.
- Coordinate project to ensure deadlines are met
- Liaise with other members of production team to ensure company goals are met

SKILLS & EXPERIENCE

Qualifications:

- Bachelor of Engineering (Mechanical and/or Manufacturing)

Experience:

- Experience in the automotive industry will be an advantage
- Any previous usage of OBD2 Scanner
- Job placement or relevant internship in a similar or lesser position

Skills:

- Genuine interest in solving complex problems and providing workable solutions
- High level computer skills
- Ability to visualize processes

- Excellent verbal and written communication
- Strong project management skills
- Strong teamwork and communications skills.

JOB DESCRIPTION 4

TITLE: Product Tester

TEAM: Development

REPORTS TO: Lead Developer

OVERVIEW:

At ColourTech, we are looking at making the roads of Australia a safer place for both motorists and pedestrians with our new speed limiting technology. With the lives of loved ones and friends of all Australians at the forefront of our minds, we aim to deliver a well optimised, public supported and government trusted product to be adopted by Australia and aims for the global market.

OBJECTIVE:

The purpose of this position is to ensure the integrity of the Computerised Accelerator Safety Device before it is manufactured and distributed and to recommend improvements to the rest of the development team At ColourTech, we need our products to work exceptionally well and be completely safe before they are installed; these products are designed to save lives.

The Product Tester will be responsible for facilitating the company's goals. This will be achieved by –

- Diligently testing products for safety and effectiveness
- Documenting and reporting all work
- Communicating findings and recommendations
- Maintain an organised and tidy workspace

RESPONSIBILITIES AND DUTIES:

- Testing products
 - Testing that products meet safety standards
 - Ensuring devices function as they should
 - Noting any issues found
- Documenting and recording work
 - Document all tests performed
 - Identify and record findings objectively
 - Report any improvement opportunities
- Communicate with the development team
 - Maintain open communication with the rest of the team
 - Ensure safety concerns are reported at the first opportunity
 - Take onboard any specific tests requested by the lead developer

QUALIFICATIONS:

Level of Education

- University degree in engineering (mechanical or electrical) or similar equivalent qualification

Knowledge/Skills

- Fluent in the English language
- Previous job placement or internship in similar product testing or development position

- High level communication skills
- Knowledge of development practices

Personal Qualities

- Understanding and patience with others
- One to take initiative
- Willingness to learn
- Positive and outgoing personality
- Accepting of all others with extremely high professionalism
- Wanting to be a part of something bigger

Group Reflection

Joshua

As more time has passed, I feel like the positives from the previous reflection have been made greater, with our group communicating well and really putting in the effort needed to get this project done. I believe the strongest point of our group is our ability to talk amongst ourselves to delegate tasks, help each other and give support when needed. If we were to do this project again, I believe we could improve our groups outcome by possibly having meetings in which we are all working on the assignment at once for effectively immediate team feedback and a quicker completion time. What surprised me was again just how much we did achieve by the end of the 10 weeks working together almost day in day out which has resulted in a group of strangers becoming a great team and ever better mates. This correlates what I learnt about groups and how its more than just a 'workplace' as such but a positive and friendly environment. Having used GitHub a great deal more with this assignment I believe this activity shows a balanced workload between I and the other group members as each input is tracked.

Lynette

With assignment 3 we made an early start and delegated tasks to each team member, when William was not able to be contacted, team members put their hands up to take on additional work. Finding meeting times which suited all team members was hard and a better participation rate would have helped but in saying that, when members that could not attend meetings and were given tasks afterwards, they ensured they got the job done. We discussed making prototypes, but it was outside the scope of our current abilities. The concept of this project was outside my knowledge and I appreciated members of the team that had a better understanding of this technology which led me to research the technologies required. Using a combination of Github and Teams for this project worked well, with some file types working better in one or the other, this course has been my first time using either and has been a great learning experience. With the Christmas & holiday period over we worked well as a team to make this project come together.

Tegan

The group worked exceptionally well together for this assessment. We obviously had to work through losing one of our team members without any notice, but most if not all of the group had personal issues going on in their own lives interfering with their capacity to attend meetings or do work assigned to them, but we all seemed to pull together, reassign tasks and use whatever means we were able to communicate issues and complications. We did find it difficult to develop the device itself as we just didn't have the skills and experience required for the task, but we put a lot of effort into the planning and design work so that with the addition of maybe an engineer or two, we would be able to progress much further. Overall, I am very happy with how we worked for this task.

Lori

While I had my own issues with attending the group meetings and assisting with assignment tasks at the start of the new year, I heavily believe that I was the weakest link, but the group worked wonderfully together on their tasks and communication with meetings going for nearly an hour every Thursday and Sunday in some cases. There've been times where we've come together to make serious decisions instead of leaving it to the captain of the group. To me the mateship and support of this group is incredible and being a part of this has given me hope in working with others again after bad experiences. We had tackled tasks and issues in different ways that didn't clash badly. It's something I'll take away from this short time together, to be more mindful to how others operate to tackle a task together. ColourTech has been fruitful and a pleasure to work with, and there isn't too much to criticize. Besides the issue with the unresponsive teammate, I would say that a timetable or schedule that all can access and monitor what work has been done and by who, then again I could just be talking to myself but I'd believe this this would increase productiveness and help keep track of what has been completed.

Group Reflection

All of us believe that over the weeks working together many things have gone well, from our communication, to task delegation and our end product. Our ability to work together seamlessly despite all having busy lives is what stood out to us most. With some of us working, having families to look after, both of these at the same time and dealing with personal and/or environmental issues we still all made time for each other to support and encourage each other to give the best we could give to work all with a smile on our faces knowing we were doing it as a team.

While we did work very well as a team there is always room for improvement, we think a good improvement would be for everyone to attend group meetings more frequently. There were members that made almost all, if not every session but there were some that didn't, and we know life does get busy sometimes but maybe one or two sessions more could have made a difference in the long run.

As for something that surprised us and something we learnt about groups, in this case it is the same thing and that's how much we have one another's back. We all are more introverted than extroverted and know it can be hard to put ourselves into a group scenario without some feeling of being uncomfortable, so we all knew to look out for everyone. For example, if a member had something come up and wasn't able to do some work at the time, others would put their hand up to help them out, no questions asked. Or, if a member was feeling down or stressed, there was always the question "are you okay?" being asked. It's the amount the groups mentality to succeed and look after one another that both surprised us and gave us a huge learning curve about the way groups operate.

This time around we used GitHub far more than we used Teams to upload and edit work. It showed us everyone working on parts of the project with daily and sometimes hours updates which really demonstrated our groups want to work hard and together to complete this project to a high standard.

References

Anon., n.d. *Electronic Speed Governor / Electronic Speed Limiter*. [Online]
Available at: <https://idiagnosis.in/Products/ElectronicSpeedLimiter.html>
[Accessed 17 January 2020].

Anon., n.d. *What is Governor? Three Major Types of Governors Used in Automobile Engine*. [Online]
Available at: <https://www.theengineerspost.com/types-of-governors/>
[Accessed 17 January 2020].

Arduino, 2020. *Arduino*. [Online]
Available at: <https://www.arduino.cc/>
[Accessed 15 February 2020].

Arduino, n.d. *Language Reference*. [Online]
Available at: <https://www.arduino.cc/>
[Accessed 15 February 2020].

Drive, 2019. *What is lane keeping assist?*. [Online]
Available at: <https://www.drive.com.au/news/what-is-lane-keeping-assist--120965>
[Accessed 15 February 2020].

Embedded Staff, 2002. *Introduction to MISRA-C*. [Online]
Available at: <https://www.embedded.com/introduction-to-misra-c/>
[Accessed 15 February 2020].

Government of South Australia Department of Planning, Transport and Infrastructure, 2018. *Government of South Australia Department of Planning, Transport and Infrastructure*. [Online]
Available at: https://dpti.sa.gov.au/_data/assets/pdf_file/0009/78282/MR1355.pdf
[Accessed 15 February 2020].

Government of Western Australia Department of Transport, 2019. *Alcohol Interlock Scheme*. [Online]
Available at: <https://www.transport.wa.gov.au/licensing/alcohol-interlock-scheme.asp>
[Accessed 15 February 2020].

Government of Western Australia Road Safety Commission, 2019. *Alcohol Interlocks*. [Online]
Available at: <https://www.rsc.wa.gov.au/Campaigns/Alcohol-Interlocks>
[Accessed 15 February 2020].

NSW Government Transport for NSW Centre for Road Safety, 2020. *Statistics*. [Online]
Available at: <https://roadsafety.transport.nsw.gov.au/statistics/index.html>
[Accessed 17 January 2020].

Proteus, 2020. *Visual Designer for Arduino*. [Online]
Available at: <https://www.labcenter.com/visualdesigner/arduino/>
[Accessed 15 February 2020].

Queensland Government Department of Transport and Main Roads, 2017. *Forward Collision Avoidance Technology*. [Online]
Available at: <https://www.tmr.qld.gov.au/Safety/Vehicle-standards-and-modifications/Vehicle-standards/Forward-collision-avoidance-technology.aspx>
[Accessed 15 February 2020].

Queensland Government, 2019. *Alcohol ignition interlocks*. [Online]
Available at: <https://www.qld.gov.au/transport/safety/road-safety/drink-driving/interlocks>
[Accessed 15 February 2020].

Rae, A., 2019. *Speed limiters are coming to Australia*. [Online]
Available at: <https://www.whichcar.com.au/news/speed-limiters-are-coming-to-australia>
[Accessed 15 February 2020].

Schonfeld, C. & S. M., 2004. *QUT ePrints*. [Online]
Available at: http://eprints.qut.edu.au/591/1/schonfeld_critical.PDF
[Accessed 15 February 2020].

Tarabay, J., 2015. *Mandatory Interlock Laws in NSW*. [Online]
Available at: <http://www.streetoncriminallawyers.com.au/mandatory-interlock-laws-in-nsw/>
[Accessed 15 February 2020].

Tung, M., n.d. *How it Works: Tesla's Autopilot Self-Driving Automobile*. [Online]
Available at: <https://www.jameco.com/Jameco/workshop/HowItWorks/how-it-works-tesla-autopilot-self-driving-automobile-technology.html>
[Accessed 17 January 2020].

Unity Point Health, n.d. *How Does da Vinci Robotic Surgery Work?*. [Online]
Available at: <https://www.unitypoint.org/cedarrapids/services-how-does-it-work.aspx>
[Accessed 11 January 2020].

Virtronics, n.d. *Simulator for Arduino v1.11*. [Online]
Available at: <http://virtronics.com.au/Simulator-for-Arduino.html>
[Accessed 15 February 2020].