

# DEAKIN UNIVERSITY

## CAPSTONE TEAM PROJECT (A)

### ONTRACK SUBMISSION

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## Company Objectives and Structure

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July 26, 2023





Figure 1: Chameleon

Pass Task 2.1P

Chameleon

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Prepared by Chameleon Leadership: [chameleon@deakin.edu.au](mailto:chameleon@deakin.edu.au)

Executive Summary

## OUR MISSION

Given the complexity of energy application needs today, IoT systems are being designed to address a wide variety of existing problems.

In Chameleon, our mission is to research, create, test, document and deploy IoT-based solutions to enhance life through the application of smart city technologies. Including the building of smarter cities, homes, transportation, and energy management systems.

## OUR STRUCTURE

There are currently three divisions within the company, focusing on the three key areas of strategic importance:

- Electric Vehicle (EV) Adoption Tools (EVAT)
- City of Melbourne Open Data (MOP)
- Chameleon Website (CW)

Both EVAT and MOP leverage datasets from several sources including data generated by IoT-based sensors and as such fit within the goals and mission of the company. The Chameleon website is our main online presence where we articulate who we are, what we do, and show case our projects to the world.

### EVAT

The EV Adoption Tools division currently has two projects underway. The first is a mobile application to help EV drivers locate and navigate to charging stations that meet the needs of their vehicles. The second uses big data to analyse the density of EV ownership, main transport routes (amongst other things) and recommends optimal locations for new EV Charging stations.

### MOP

The City of Melbourne Open Data Project engages with The City of Melbourne to support a greater use of their Open Data library for businesses, researchers, and software developers. The Melbourne Open Playground (MOP) is an educational portal that demonstrates how to leverage open data using real-world scenarios in order to assist The City of Melbourne to achieve key strategic goals.

CW

The Chameleon Website aims to accumulate all the information about the Chameleon company and present it in a format that is pleasantly designed, laid out, easy to navigate and displays the progress of each of its three projects and outlines their goals. This project aims to provide a one-stop portal to different links and sub-projects within the company.

Leadership Team

**Acting Director:** Azadeh Ghari Neiat.

**Company Board:** Azadeh Ghari Neiat, Jon Suwannakoot, Barry Chen, Mollie Fernandez, Yesini Charithma Liyanage, Jordan Sam Cooke

EV Adoption Tools

Group Project Lead: Yesini Charithma Liyanage & Jordan Sam Cooke

EV Charger Forecasting & Location Optimisation (*sub project 1*)

- Sub Project Lead: Yesini Charithma Liyanage
- Web Dev Lead: Mark Premier
- Data Science Lead: Jamie Connor Davidson
- Web Dev Co-lead: Ishika Khanna
- Data Science Co-Lead: Jennifer Yau

Evoleon Mobile Application (*sub project 2*) - Sub Project Lead: Jordan Sam Cooke - App Dev Lead: Anan Abdullah - App Dev Co-Lead: Joel Murphy-Dyer

Melbourne Open Data Project

Project Leads: Barry Chen & Mollie Fernandez

- Data Science Leads: Shanuk Julian Devamulla, Keefe Euler Alpay, Vaibhav Kashyap, Simranjit Singh, Yash Krupanand Daware
- Web Development Lead: Jiahao Pen, Yashika Arora
- Security Team Lead: Izaz Ishaque, Amby Sarrazin, Michael Wei Zhang

Chameleon Website

Project Lead: Jon Suwannakoot

- Web Development Lead: Aaron Vandersluys, Davinderjit Singh, Satyam Raina, Mukund Nivas Srinivasan
- Design Team Lead: Jon Suwannakoot
- Assistant Design Lead: Brodie McCann

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Company Structure

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Trimester Goals & Objectives

### **Trimester 2 2023 Objectives**

As well as moving each of the Chameleon projects closer to their overall goals, we have identified the following areas for improvement this trimester.

- Create and document a policy for the creation and storage of documents with a focus on storing and managing key company documents on GitHub. The process will include, migrating company documents to GitHub and converting them to markdown in the process.
- Document the best practice policy for the maintenance of the company's GitHub repository, this is to include how to prepare the repository for handover at the end of the trimester.
- Document a policy and procedure for the overall handover process for the company making it seamless for future studentsb fvc. This involves:
  - Centralising credentials and resources used throughout the company.
  - Have multiple junior students brought into the handover process across all projects so that the knowledge does not sit with one team, project or person.
- Introduce cross-collaboration across all projects within the company including:
  - Sharing teams such as design & security
  - Having multiple cross-company meetings to get all team members (especially the juniors) familiar with the company as a whole.
  - Share wins, roadblocks, resources and topics across similar teams from other projects.
- Introduce and document Cyber Security best practices, and stress tests across all projects. This will introduce future tasks that the web development teams can complete.
- Implement a Design plan across all projects that details the colour scheme to layouts to high-fidelity quality produced wireframes with quality prototyping.

Projects Overview

EV Adoption Tools

The EV Adoption Tools project aims to drive increased adoption of Electric Vehicles (EVs) in Australia. This will help drive reduced dependence on fossil fuels, lower greenhouse gas emissions and have a positive impact on the environment and global weather events.

## **EV Charger Forecasting & Location Optimisation**

**Overview** Project EVCFLO provides aid to this cause through two key services: interactive maps using Google API, and an AI Prediction System, that recommends new Electric Vehicle Charging Station (EVCS) locations which will be used effectively by the relevant population.

### **Goals & Objectives**

1. Using community data to expand on our database through the addition of newly found datasets.
2. Narrow down to the key external factors which impact the usage and success of EVs and EVCSs
3. Display newly discovered EVCS locations onto a visual map.
4. Integrate new EVCS locations onto our Google API interactive map.

**Aims this Trimester** The project's primary goals encompass creating a robust online presence for EVAT by establishing a LinkedIn page and producing compelling content related to EVCFLO and Evolean. In the realm of data science, the focus is on streamlining workflows across the team, expanding the EV Charging station Location database with new datasets, and generating comprehensive notebooks for data analysis and modelling. The team aims to develop interactive dashboards using Tableau and Power BI to track progress and company analytics, specifically monitoring the growth of charging station data over time. Additionally, the data science team will prepare trimester reports to identify potential project directions and explore collaboration opportunities with other departments. In parallel, the web development team will revamp the front-end design based on design team documents and Evolean app styling, enhancing the website's user interface. They will integrate newly discovered EVCS locations on a visual map and implement a heatmap to showcase activity hubs for electric car chargers. The addition of a chatbot and a login function with Firebase backend connectivity will further elevate the website's functionality, while ongoing improvement of clustering predictions will enhance overall performance. Through these endeavours, the project seeks to bolster EVAT's digital presence and advance data science and web development capabilities.

**Deliverables** Data Science - Continue development of standardising workflows across all elements of the data science team. - Expand on our EV Charging station Location database through the addition of new and updated datasets. - Provide list of completed notebooks (link to webpage) for data analysis: transform, visualise, model, communicate. - Develop dashboards (Tableau & Power BI) tracking progress and internal company analytics, i.e increase in charging station analytics from trimester to trimester. - Produce a trimester report for identifying potential directions for projects within the data science team and where collaboration can be made with other chameleon teams.

Web Dev - Refresh the design of the front end based on documents by the design team, as well as the Evoleon app styling. - Display newly discovered EVCS locations onto a visual map.

- Create a 'heatmap' showing activity hubs for electric car chargers
- Create a chatbot that will popup when using the website
- Create a login function with connectivity to the firebase backend that the Evoleon app uses.
- Create design mock-ups for the new pages that will be created
- Integrate new EVCS locations onto our Google API interactive map (Web-Development team).
- Continue to improve the clustering predictions, these are working but can be improved.
- Implement website designs on the EVCFLO website and increase the sites functionality.

### **EVCFLO Project Members**

<b>Name</b>	<b>Student_ID</b>	<b>UG/PG</b>	<b>J/S</b>	<b>Team</b>	<b>Lead</b>
<b>Yesini Charithma Liyanage</b>	222063923	Undergrad	Senior	Web Dev	Yes
<b>Jamie Connor Davidson</b>	222356461	Postgrad	Senior	Data Science	Yes
<b>Jennifer Yau</b>	222087183	Postgrad	Junior	Data Science	Yes
<b>Yuvraj Sekhon</b>	222184401	Undergrad	Junior	Data Science	
<b>Mark Justin Premier</b>	222115089	Postgrad	Senior	Web Dev	Yes
<b>Ishika Khanna</b>	219551957	Undergrad	Senior	Web Dev	Yes
<b>Yousef Ashraf Y A</b>	221410734	Undergrad	Senior	Web Dev	
<b>Al-Mulla Hoi Fung</b>	222383729	Postgrad	Junior	Web Dev	
<b>Dicky Shuodong Xing</b>	219368407	Undergrad	Junior	Web Dev	

### **Evoleon Mobile Application**

**Overview** The Evoleon App will help EV owners better plan their trips by identifying optimal EV charging stations as waypoints on their journey and provide them relevant information about those charging stations.



**Goals & Objectives** The goal of this project is to be able to design and implement a mobile app (Android and IOS) to help consumers identify nearby charging locations. Although there are existing products that are similar, here are a few examples of what the app may offer in addition to the core function of locating a socket:

- Providing additional information and filtering of stations based on type (EV vs hydrogen, for example), information on the source of the power (direct solar, grid powered, gas, diesel etc).
- Providing a full journey planner for longer trips that optimizes for reducing charge time, cost and environmental impact along the route.
- Ability to incorporate your usage data with current fuel prices, cost of maintenance etc and provide an indication of real savings for running the vehicle.

**Aims this Trimester** The aim this trimester is to continue implementing the designs created by previous teams and increase the applications functionality. A basic version of the app is currently working but it only has a few screens implemented and the functionality is very limited.

#### **Deliverables**

- Work on adding real EV Location data into the new Firestore locations database.
- Create a Navigation System for the applications map to travel to a selected EV Charger.
- Add an option to filter EV chargers on the map based on amenities stored in database for that EV charging location.
- Move the hamburger menu from the top left of the screen to a menu at the bottom of the screen, similar to the Figma designs.
- Complete a cyber security review of the app's authentication process, data storage, code in GitHub repository, and apps terms and conditions.
- Add the process to reset a user's password or delete an account.
- Continue adding user interface code for the applications pages. ####  
Evoleon App Project Members

Name	Student ID	UG/PG	J/S	Team	Lead
Jordan Sam Cooke	220208777	Undergrad	Senior	App Dev, Project	Yes.
Aanan Abdullah	220499062	Undergrad	Senior	App Dev	Yes
Joel Murphy-Dyer	221081809	Undergrad	Senior	App Dev	Co.
Rodney Tenzin Tsewang Annand	221156479	Undergrad	Senior	App Dev	
Wei Liang Tiew	220427347	Undergrad	Senior	App Dev, Design	
Asher Lam	221254112	Undergrad	Senior	Web Dev	
Mohammed Khalid M J	220499349	Undergrad	Senior	App Dev	
Al-Malki Daniel	221240956	Undergrad	Junior	App Dev	
D'Amore Ambre	220321559	Undergrad	Junior	Security	
Sarrazin Shuodong Xing	219368407	Undergrad	Junior	App Dev	

## Melbourne Open Data

**Overview** The City of Melbourne has been an Australian leader in Open Data since 2014. The City of Melbourne initiated this project with Deakin to support greater use of their Open Data by businesses, researchers, and software developers. Open Data is a component of their smart cities' strategy.

**Goals & Objectives** This project entails the development of an educational platform that showcases the practical applications of Open Data, specifically designed to cater to the needs of various stakeholders, such as industry professionals, government entities, and academic researchers. The primary objective of this project is to leverage the utilisation of the City of Melbourne's Open Data.

The long-term goal is to data usage, facilitating innovative and informed solutions to contemporary challenges across the City of Melbourne council area.

**Aims This Trimester** The initial main focus is to understand the documentation for the project's new API and systematically work through each published (and yet to be published) notebooks and modify the code so that they will run if downloaded.

The aim for the Data Science team is to create a new set of use cases that fit within the 3 defined key areas of interest from the City Of Melbourne. The team is planning to complete a full set of use cases.

The web team is aiming to further streamline the processes for which the notebooks are published, and working with the design team to optimise the device browsing of our website. As part of the approach to the website, the cyber security team will be conducting tests and an audit, not only for the City of Melbourne Project project but also throughout the whole of Chameleon to ensure that all projects are up to par when it comes to security, all tests will be reported and if there any major issues detected within any of the projects the security team will ensure the best practices are being implemented.

### **Deliverables**

- Update the API on all remaining published notebooks - (Data Science Team)
- Complete analysis on multiple use cases (ready for publishing) - (Data Science Team)
- Create multiple new use cases, allowing enough in the backlog for the next trimester - (Data Science Team)
- Publish notebooks that are ready to be published - (Data Science & Web Dev Team)
- Cleaner resources for the handover procedures for MOP - (All Teams)
- Fix deployment issues and Implement a human-readable URL- (Web Dev Team)
- Add more functionality to the website- (Web Dev Team)
- Implement some interactivity with JavaScript- (Web Dev Team)
- Fix the lingering design / css issues within the website- (Web Dev Team)
- Fix design / css issues on old user case pages- (Web Dev Team)
- Identify vulnerabilities in the source code, python code and database then document a roadmap to mitigate them - (Cyber Security Team)

### **Project Members**

Name	Student ID	UG/PG	J/S	Team	Lead
Chaoyi (Barry) Chen	220358865	Undergrad	Senior	MOP Project Co-Lead	Yes
Mollie Fernandez	217285498	Postgrad	Junior	MOP Project Co-Lead	Yes
Vaibhav Kashyap	220641102	Undergrad	Senior	Data Science	Yes
SimranJit Singh	222429305	Postgrad	Junior	Data Science	Yes
Kruthi Shetty	222067974	Postgrad	Senior	Data Science	Yes
Yash Kru-panand	222482648	Postgrad	Junior	Data Science	Yes
Daware Shanuk	221159324	Undergrad	Senior	Data Science	Yes
Julian Deva-mulla	221243463	Undergrad	Senior	Data Science	Yes
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Siyu Ai	222337088	Undergrad	Senior	Data Science	
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Jackson Tran	222376251	Postgrad	Junior	Data Science	
Siju Deng	213358131	Undergrad	Senior	Data Science	
THI THANH QUYEN (Amy) Tran					
Prathibha Kan-dawala	222440671	Postgrad	Junior	Data Science	

Name	Student ID	UG/PG	J/S	Team	Lead
Jiahao Pan	218562599	Postgrad	Senior	Dev Team	Yes
Yashika Arora	221080858	Undergrad	Junior	Dev Team	Yes
Mihili Isurika	222398483	Undergrad	Senior	Dev Team	
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Syed Kareemullah	220462373	Undergrad	Senior	Dev Team	
Izaz Ishaque	221005704	Postgrad	Senior	Cyber Security	Yes
Amby Sarrazin	220321559	Undergrad	Junior	Cyber Security	Yes
Michael Wei	221282074	Undergrad	Senior	Cyber Security	Yes
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Kein Antony	221471405	Postgrad	Senior	Cyber Security	
Raju Amal	222197619	Postgrad	Senior	Cyber Security	
Paul					

##

Chameleon Website

**Overview** The website for the Chameleon company aims to publicise the achievements and progress of Chameleon overall and showcase the sub-companies within it. One of the best ways to do this is through a website.

**Goals & Objectives** The website's main objective is to provide a single source for all Chameleon-related matters, including other sub-companies information, objectives and links. We want to use the Chameleon website to advocate for the company and promote it while having the website be visually appealing and come with straightforward functionality.

**Aims this Trimester** The aim for this trimester will be to modify the front-end and the back-end of the website and to make it optimised for mobile access. While the back-end has yet to be implemented, it means we have much scope to implement this from scratch. This includes setting up the staff log-in portal, implementing APIs with SendGrid and Mailchimp and creating a client portal.

For the front-end of the website, we aim to make the website more appealing with the students' design and web development skills. We want to deliver a high-quality, attractive, easy-to-navigate and high usability website. To do this, we will implement correct wireframing and prototyping techniques to develop a solid design that meets requirements before implementation.

It will be necessary for the Chameleon Website to showcase all the other projects being carried out by the Chameleon company. Therefore, incorporating these projects into the website has commenced, but links still need to be provided.

Overall, optimising the user website experience and reducing awkwardness is the primary aim for this trimester.

## **Deliverables**

- Develop the website style guide to ensure consistency in design
- Update the logos of Chameleon's website, MOP and Chameleon's company
- Design the website landing page that incorporates other Chameleon projects
- Create responsive mobile-compatible designs, including wireframes and prototypes for each project within Chameleon (EV, MOD and Website)
- Implement a more aesthetic and user-friendly design. This includes stylistic components (e.g. fonts, colour scheme, buttons) and general usability (e.g. layout, navigation, consistency)
- Develop the website landing page that connects Chameleon projects
- Develop responsive mobile views for the website (code)
- Enhance login portal functionality

- Develop a news/blog page that provides end-users with project news and updates
- Build the staff login portal and implement required the backend components
- Re-evaluate the resources tab to see what can be added and removed from it
- Research and implement an SEO strategy to rank the website higher in web search engines
- Develop a client user account portal system to view the progress, updates, and services of the Chameleon Projects. Possibly include the ability to sign up for browser notifications / newsletters
- Review and implement required / potential APIs

#### Project Members

Name	Student ID	UG/PG	J/S	Team	Lead
Jon Suwan-nakoot	220069966	Undergrad	Senior	Team Leader / Design	Yes
Brodie McCann	219307567	Undergrad	Junior	Design	Yes
Nitin Singh Dogra	221265784	Undergrad	Senior	Design	
Aaron James Vander-sluis	221178806	Undergrad	Junior	Web Dev	Yes
Davinderjit Singh	219606745	Undergrad	Senior	Web Dev	Yes
Satyam Raina	222196882	Undergrad	Junior	Web Dev	Yes
Mukund Nivas Srinivasan	219432166	Undergrad	Junior	Web Dev	Yes
Wei Liang Tiew	220427347	Undergrad	Senior	Web Dev	

<b>Name</b>	<b>Student ID</b>	<b>UG/PG</b>	<b>J/S</b>	<b>Team</b>	<b>Lead</b>
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<b>Jordan Reeves</b>	217140954	Undergrad	Senior	Web Dev	
<b>Seung Hwan Kim</b>	221393121	Undergrad	Senior	Web Dev	
<b>ZhuoYu Li</b>	220283605	Undergrad	Senior	Web Dev	
<b>Ziyan Zhai</b>	221208796	Undergrad	Senior	Web Dev	
<b>Thomas Kout-saplis</b>	220233577	Undergrad	Senior	Web Dev	
<b>Aye Moh Moh Shwe</b>	220462239	Undergrad	Senior	Web Dev	
<b>George Chia</b>	219600175	Undergrad	Junior	Web Dev	
<b>Navin Selvaraj</b>	222056367	Undergrad	Junior	Web Dev	
<b>Muhammed Rehan Qureshi</b>	218062706	Undergrad	Junior	Web Dev	
<b>Tatiana Deinega</b>	221117779	Postgrad	Junior	Web Dev	
<b>Matheesha Nirvan Pal-liyaguruge Gee-ganagama Arachchige</b>	222506155	Undergrad	Junior	Web Dev	
<b>Yawen Liu</b>	218616602	Undergrad	Junior	Web Dev	
<b>Pranshul</b>	222196274	Undergrad	Junior	Web Dev	