Name		Status		Logistics								Hardware Requirements					Software Requirements	Description
ID	Task	Subtask	Status	Blocking Point	Priority	Discipline	Specific Discipline	Assigned	Time Estimate	Time Taken	Update Date	Worksession/Home	Jetson Required	STM32 Required	Realsense Required	Car Chassis Required	Development Package	Description
10	Track Design	4	Complete		P0	Preparation	Track	Ferréol	30	70	11/9/2024						NA	Make initial 5m X 5m grid for the track
10.1	Track Design	Material Research	Complete		P0	Preparation	Track	Ferréol	6	8	10/20/2024	Home	No	No	No	No	NA	Find the appropriate material for the track, for the lines. Look up prices, compare feasibility and quality of different options
10.2	Track Design	Material Purchase	Complete		P0	Preparation	Track	Ferréol	8	8	10/26/2024	Home	No	No	No	No	NA	Visit stores for quotes, purchase material and tools required, bring to McGill
10.3	Track Design	Esquisse	Complete		P0	Preparation	Track	Ferréol	8	14	11/2/2024	Worksession	No	No	No	No	NA	Draw general outline for the track, take measurements and place markings precisely before permanent
10.4	Track Design	Réalisation	Complete		P0	Preparation	Track	Ferréol	8	40	11/17/2024	Worksession	No	No	No	No	NA	Apply permanent markings to the track
11	IMU Data - Bosch Sensor	5	Complete		P1	Hardware	Electronics	Xin Ya	54	30	11/22/2024						Sensing	Obtain accurate data from the IMU
11.1	IMU Data - Bosch Sensor	Understand Sensor	Complete		P1	Hardware	Electronics	Xin Ya	4	4	10/26/2024	Home	No	Yes	No	No	Sensing	Read up on the documentation and understand how the sensor works. Be able to explain to anyone on the team
11.2	IMU Data - Bosch Sensor	Read Values with STM32	Complete		P1	Hardware	Electronics	Xin Ya	10	10	11/2/2024	Home	No	Yes	No	No	Sensing	Use STM32 to read values from the sensor and print them. Must be able to parse and get all data output by sensor
11.3	IMU Data - Bosch Sensor	Test Quality of Values	Complete		P1	Hardware	Electronics	Xin Ya	20	10	11/9/2024	Worksession	No	Yes	No	No	Sensing	Test the quality of the data output and its limits. Prepare testing document and data analysis
11.4	IMU Data - Bosch Sensor	UART with Jetson	Complete		P1	Hardware	Electronics	Xin Ya	10	4	11/23/2024	Worksession	Yes	Yes	No	No	Sensing	Establish serial communication with the Jetson. Test for different use cases and make sure to be able read clearly
11.5	IMU Data - Bosch Sensor	Script/Flash	Complete		P1	Hardware	Electronics	Xin Ya	10	2	11/30/2024	Home	No	Yes	No	No	Sensing	Write script that automatically reads IMU data and publishes it over UART. Must be robust with reset.
12	Motor Control - Input Acceleration	7	In Progress		P2	Hardware	Electronics	Xin Ya	45		1/11/2025						Sensing	Develop a new and better way to control the output to the motor
12.1	Motor Control - Input Acceleration	Understand current control	Complete		P2	Hardware	Electronics	Xin Ya	4	8	12/26/2024	Home	No	Yes	No	No	Sensing	Find out whatever is going on with the current script. Why speed? How is it converted? What does the motor get? Why did they do it like that? Research how the motor works and its specs.
12.2	Motor Control - Input Acceleration	Work out our needs	Complete		P2	Hardware	Electronics	Xin Ya	1	4	1/4/2025	Worksession	No	No	No	No	Sensing	Discuss with software and hardware to see what is best for us. What is used in industry? What gives us the best response? What is feasible and not based on previous task.
12.3	Motor Control - Input Acceleration	Develop Script	Complete		P2	Hardware	Electronics	Xin Ya	8		1/11/2025	Home	No	Yes	No	Yes	Sensing	Write out a script that implements what has been decided. Provide adequate documentation
12.4	Motor Control - Input Acceleration	Test Script	Not required		PN	Hardware	Electronics	Xin Ya	8		1/11/2025	Worksession	No	Yes	No	Yes	Sensing	Test out the script with the motor. See the response and provide testing documentation. Iterative approach to work out algorithm
12.5	Motor Control - Input Acceleration	Combine with IMU script & Flash	Not required		PN	Hardware	Electronics	Xin Ya	8		1/18/2025	Home	No	Yes	No	No	Sensing	Combine the script with the IMU script to be able to run both at once.
12.6	Motor Control - Input Acceleration	Test combined script	Not required		PN	Hardware	Electronics	Xin Ya	8		1/11/2025	Worksession	Yes	Yes	No	Yes	Sensing	Test out combined script. Make sure no errors, lost data, stalling, delays, corruption
12.7	Motor Control - Input Acceleration	UART with Jetson	Not required		PN	Hardware	Electronics	Xin Ya	8		1/11/2025	Worksession	Yes	Yes	No	Yes	Sensing	Test out combined script. Make sure no errors in communication, crashing or lost signals
13	Technical Challenge Path	4	In Progress		P4	Software	Path Planning	Yu Qing	38		2/22/2025						Planning	Optimize path for the technical challenge
13.1	Technical Challenge Path	Survey of available approaches	Complete		P4	Software	Path Planning	Yu Qing	8		11/9/2024	Home	No	No	No	No	Planning	What are the available options? Pros and Cons of each? Specificities to our competition? Be able to present and explain them to the team to discuss. Select 2 or 3 approaches to attempt
13.2	Technical Challenge Path	Develop algorithm following approach	In Progress		P4	Software	Path Planning	Yu Qing	12		12/7/2024	Home	No	No	No	No	Planning	Develop algorithm in python, visualisation required. Summary of results, problems and what they imply. Take into account possible placement, trajectory, re-adjustment, etc.
13.3	Technical Challenge Path	Test algorithm (Graph)	Waiting	Dependent on prior task	P4	Software	Path Planning	Yu Qing	12		1/11/2025	Home	No	No	No	No	Planning	Iterative testing, in combination with previous task/algorithm development
13.4	Technical Challenge Path	Simulator testing of paths	Waiting	Dependent on prior task	P4	Software	Path Planning	Yu Qing				Home	No	No	No	No	Planning	Run the car in the simulator such that it follows all the possible paths from all starting locations. Identify any weaknesses of issues of the following types : time, obstacles, speed, respect of road regulation
13.5	Technical Challenge Path	Integrate algorithm	Waiting	Dependent on prior task	P4	Software	Path Planning	Yu Qing	6		2/8/2025	Home	No	No	No	No	Planning	Integrate the algorithm with the other packages. Fix any merging issues and situations in which to apply it.
14	RealSense - Launch	3	Complete		P2	Hardware	Devices	Malo & Simon	36		11/1/2024						Sensing	Fix realsense launch issues, find method to launch reliably and consistently
14.2	RealSense - Launch	Understand provided code	Complete		P2	Hardware	Devices	Malo	8	8	10/27/2024	Home	No	No	Yes	No	Sensing	How does the current script launch the realsense and send the data? ROS? Serial communication? Explanation for everyone.
14.3	RealSense - Launch	Survey of problems	Complete		P2	Hardware	Devices	Malo	12	12	11/2/2024	Home	Yes	Yes	Yes	No	Sensing	Discuss issues that aros last year. Detail them and find out what causes them. Documentation and explanation for issues to explain to team mates.
14.4	RealSense - Launch	Find method to launch realsense	Complete		P2	Hardware	Devices	Simon	16	20	11/9/2024	Home	Yes	Yes	Yes	No	Sensing	Find the method that enables the realsense launch with reliability. New script? Settings within current script? Required manipulations? Document procedure.
15	IMU Data - RealSense	4	In Progress		P3	Hardware	Devices	Malo & Xin Ya	30		12/16/2024						Sensing	Obtain accurate data from the RealSense IMU
15.1	IMU Data - RealSense	Understand IMU function	Complete		P3	Hardware	Devices	Malo	4	4	11/9/2024	Home	No	No	Yes	No	Sensing	Understand the way the RealSense IMU works. Specificities, ways it publishes data and how it communicates
15.2	IMU Data - RealSense	Identify issues with IMU data	Complete		P3	Hardware	Devices	Xin Ya	10	10	11/23/2024	Home	No	No	Yes	No	Sensing	Identify the issues with obtaining the data. Survey data from previous year, test situations and launching
15.3	IMU Data - RealSense	Find method to acquire IMU data	Complete		P3	Hardware	Devices	Xin Ya	10	4	11/30/2024	Home	No	No	Yes	No	Sensing	Find the method that enables us to get IMU data from the RealSense reliably. New script? Settings within current script? Required manipulations? Document procedure.
15.4	IMU Data - RealSense	Test Quality of Values	Complete	Filtering to get the YAW yields unstable values	P1	Hardware	Devices	Xin Ya	6		11/30/2024	Worksession	Yes	No	Yes	No	Sensing	Test the quality of the data output and its limits. Prepare testing document and data analysis
16	Documentation - Hardware	2	In Progress		P2	Hardware	Documentation	Malo	8		1/1/2025						NA	Document this year's hardware
16.1	Documentation - Hardware	Interaction Diagram	In Progress		P2	Hardware	Documentation	Malo	4		12/16/2024	Home	No	No	No	No	NA	Create architecture for hardware. Detail with all components and connections.
16.2	Documentation - Hardware	Organize previous year documents	Complete		P3	Hardware	Documentation	Malo	4	4	11/16/2024	Home	No	No	No	No	NA	Organize last year's documents for further reference and help
17	Documentation - Software	2	In Progress		P2	Software	Documentation	Simon	22		1/1/2025						Multiple	Document this year's software
17.1	Documentation - Software	Re-Organize GitHub RePo	Complete		P2	Software	Documentation	Simon	10		11/30/2024	Home	No	No	No	No	Multiple	Organize the GitHub Repo such as to make it easier to navigate and develop. Needs to be done before sharing with BPMC
17.2	Documentation - Software	Write ReadME for all	In Progress		P4	Software	Documentation	Simon	12		1/1/2025	Home	No	No	No	No	Multiple	Write ReadMe for all repositories, to make it understandable and portable. All important information should be contained such that a newcomer knows how to install and use
18	Integration Testing	3	In Progress		P1	Hardware	Testing	Malo	16		1/1/2025						Multiple	Ongoing integration testing for all algorithms
18.1	Integration Testing	Previous Year Running	Complete		P1	Hardware	Testing	Malo	6		11/16/2024	Worksession	Yes	Yes	Yes	Yes	Multiple	Get last year's algorithms to work
18.2	Integration Testing	New Car Kit/Running	Complete		P1	Hardware	Testing	Malo	10		12/7/2024	Worksession	Yes	Yes	Yes	Yes	Multiple	Get last year's algorithms to work on the new Bosch provided Harware
18.3	Integration Testing	General Testing/Bug Fixing	Complete		P1	Hardware	Testing	Malo/Simon	4		11/13/2024	Worksession	Yes	Yes	Yes	Yes	Multiple	General testing to find issues with code, hardware. Test for accuracy, reliability,etc.
19	Steering Calibration	2	Complete		P2	Hardware	Testing	Malo/Ferréol	21		12/16/2024						Sensing	Calibrate the steering for accuracy
19.1	Steering Calibration	Test the actual steering accuracy	Complete		P0	Hardware	Testing	Malo/Ferréol	3	8	11/23/2024	Worksession	Yes	Yes	No	Yes	Sensing	Test the current quality of the steering
19.2	Steering Calibration	Calibrate the steering	Complete		P0	Hardware	Testing	Malo/Ferréol	10	40	11/23/2024	Worksession	Yes	Yes	No	Yes	Sensing	Calibrate and ajust the sensitivity of the steering
19.3	Steering Calibration	Characterize the motor and create speed curve	Complete		P0	Hardware	Testing	Malo/Ferréol	8		12/31/2024	Home	No	No	No	Yes	Sensing	Measure multiple different turning radii from given range of input PWM values, fit curve to the point cloud to get relationship between the turning radius and input PWM
19.4	Steering Calibration	Write function to compute speed from curve	Complete		P0	Hardware	Testing	Malo	8		12/31/2024	Worksession	Yes	Yes	No	Yes	Sensing	Modify the code on the STM32 to be able to compute the PWM given an input Steering angle from the equations found in the preceding task
20	Chassis Design - Development	3	In Progress		P2	Hardware	Chassis	Ferréol	14		11/9/2024						NA	Design a chassis that makes the installing and removing of all boards (Jetson, STM32) easy and efficient. Must take into account cable management, rigidity, stability
20.1	Chassis Design - Development	Measurements and survey	Complete		P2	Hardware	Chassis	Ferréol	2		10/20/2024	Worksession	Yes	Yes	Yes	Yes	NA	Survey of car dimensions, installation and anchor points, dimensions of boards and of chasis.
20.2	Chassis Design - Development	Design hypothesis	Complete		P2	Hardware	Chassis	Ferréol	2		10/26/2024	Home	No	No	No	No	NA	Rough ideas and brainstorming, different approaches and possible mechanisms that could work
20.3	Chassis Design - Development	Modelling	Complete		P2	Hardware	Chassis	Ferréol	6		10/26/2024	Home	No	No	No	No	NA	Modelling and design of actual parts
20.4	Chassis Design - Development	Printing and testing	In Progress		P2	Hardware	Chassis	Ferréol	4		11/2/2024	Worksession	Yes	Yes	Yes	Yes	NA	Printing and testing of parts to see if functional design
21	Communication with Car	4	Complete		P2	Software	Running	Simon	56		2/1/2024							Implement a way to communicate with the car that minimizes delays and gives us real-time feedback
21.1	Communication with Car	Identify source of current problems	Complete		P2	Software	Running	Simon	6		12/7/2024	Worksession	Yes	No	Yes	No	Multiple	Identify the reasons for which communication is very slow right now
21.2	Communication with Car	Research alteratives & report	Complete		P2	Software	Running	Yu Qing	10		1/5/2025	Home	No	No	Yes	No	Multiple	Research alternative methods of communication with the jetson, that would enable real-time streaming of data
21.3	Communication with Car	Implement test scripts	Complete		P2	Software	Running	Yu Qing	20		1/19/2025	Home	No	No	Yes	No	Multiple	Implement test scripts and measure the delays of communication between devices
21.4	Communication with Car	Adapt to the dashboard	Complete		P2	Software	Running	Yu Qing	20		2/1/2025	Worksession	Yes	No	Yes	No	Multiple	Adapt the dashboard so that the source of the data can be from the stream of information and not through ROS
21.5	Communication with Car	Adapt to services	In Progress		P2	Software	Running	Yu Qing	20		2/1/2025	Home	No	No	No	No	Multiple	Adapt the services such that they are called through TCP and not through ROS
22	Lane Center Relocalization	2	In Progress		P2	Software	Localization	TBD	30		2/11/2025	Home	No	No	No	No	Planning	Adapt lane detection such that it uses the lanes to relocalize the car in the center of the lane
22.21	Lane Center Relocalization	Implement algorithm to estimate current position	In Progress		P2	Software	Localization	Simon			2/1/2025	Home	No	No	No	No	Planning	Implement an algorithm that can take the current lane center and estimate the car's position on the map with respect to this lane center.
22.2	Lane Center Relocalization	Lane detection relocalization in Simulator	In Progress		P2	Software	Localization	TBD	10		2/1/2025	Home	No	No	No	No	Planning	Test the relocalization in the simulator to see if the relocalization is accurate
22.3	Lane Center Relocalization	Testing lane detection relocalization on track	In Progress		P2	Software	Localization	TBD	20		2/11/2025	Worksession	Yes	Yes	Yes	Yes	Planning	Test the relocalization on the real track to see how the relocalization affects the performance
23	Speed Calibration	5	In Progress		P2	Hardware	Running	Malo & Ferréol	10		12/8/2024	Worksession	Yes	Yes	Yes	Yes	NA	Make sure that the commands we are sending to the car reflect the actual behaviour of the car
23.1	Speed Calibration	Test the current speed accuracy	Complete		P1	Hardware	Running	Malo & Ferréol	4		11/29/2024	Worksession	Yes	Yes	Yes	Yes	NA	Test the calibration that Bosch made on the car. Check for error values and accuracy
23.2	Speed Calibration	Understand the code for controlling speed	Complete		P1	Hardware	Running	Malo & Ferréol	3		12/21/2024	Home	No	No	No	No	NA	Understand the code so that adjustments are based on the internal workings of the embedded system platform
23.2	Speed Calibration	Tune the values for speed	Complete		P1	Hardware	Running	Malo & Ferréol	8		12/31/2024	Worksession	Yes	Yes	No	Yes	NA	Tune the values based on the test results and the understood code from embedded platform
23.3	Speed Calibration	Characterize the motor and create speed curve	Complete		P1	Hardware	Running	Malo & Ferréol	8		12/31/2024	Worksession	Yes	No	No	No	NA	Measure multiple different speeds from given range of input PWM values, fit curve to the point cloud to get relationship between the speed and input PWM
23.4	Speed Calibration	Write function to compute speed from curve	Complete		P1	Hardware	Running	Malo	8		12/31/2024	Worksession	No	Yes	No	Yes	Embedded System	Modify the code on the STM32 to be able to compute the speed from the equations found in the preceding task
24	SLAM Realsense	5	In Progress		P2	Software	Localization	Simon	59.00		1/11/2025	Home	No	No	No	No	Sensing	Implement simultaneous localization and mapping using the realsense camera
24.1	SLAM Realsense	Algorithm Research	In Progress		P2	Software	Localization	Simon	10.00		12/26/2024	Home	No	No	No	No	Sensing	Look into the slam algorithm and if it is feasible for our car and for our current use case
24.2	SLAM Realsense	Testing different libraries	In Progress		P2	Software	Localization	Simon	10.00		1/4/2025	Home	No	No	No	No	Sensing	Research different libraries that are currently available for the intel realsense camera that make use of both the IMU, the Depth camera and the wide anefle camera
24.3	SLAM Realsense	Simulator Testing	In Progress		P2	Software	Localization	Simon	20.00		2/1/2025	Home	No	No	No	No	Sensing	Do some testing on the simulator to see if the libraries can actually be used to localize the car and if the results are promising
24.4	SLAM Realsense	Jetson Runtime Test	Waiting	Segmentation fault when launching ROS-Realsense	P2	Software	Localization	Simon	4.00		1/11/2025	Worksession	Yes	No	No	No	Sensing	Do some runtime tests on the jetson to see if it is able to work throught the algorithm at a steady pace and is compatible with the object recognition model
24.5	SLAM Realsense	Integration Testing	Waiting	Dependent on prior task	P2	Software	Localization	Simon	15.00		1/18/2025	Worksession	Yes	No	No	No	Sensing	Do an integration test to see if it is possible to use this algorithm on the real track
25.1	Power Distribution Board Replacement	4	In Progress		P2	Hardware	Running	Xin Ya	6.00		1/5/2025	Worksession	No	No	No	No	NA	Attempt to isolate which component is causing the absence of voltage at the terminals. Use both the gerber files on altium to look at the circuit diagram and probe points on the actual board
25.2	Power Distribution Board Replacement	Research alteratives, potential solutions & report	Complete		P2	Hardware	Running	Xin Ya	8.00		1/12/2025	Home	No	No	No	No	NA	Survey the different options available to us and evaluate their feasibility. Rank them in terms of their worth to the project considering cost, ease of implementation, and time taken to implement. Present the report to the team
25.3	Power Distribution Board Replacement	Temporary replacement of old board	Complete		P1	Hardware	Running	Xin Ya			1/26/2025	Worksession	No	No	No	No	NA	Remove the motor wires from the new board and connect them to the old board so that we can use only the old board in the testing of the car, and therefore only one battery
25.4	Power Distribution Board Replacement	Design, submissions, purchase or ordering of solutions.	Complete		P2	Hardware	Running	Xin Ya	4.00		1/26/2025	Home	No	No	No	No	NA	Send out any submissions and contact suppliers if needed, order components
25.5	Power Distribution Board Replacement	Installation of new powerboard	Waiting	Waiting for reception of PDB	P2	Hardware	Running	Xin Ya	10.00		2/1/2025	Worksession	No	Yes	No	Yes	NA	Test out the chosen solution and subsequently install it on the car once everything has been verified to be working
26	Track Design - Qualification	3	In Progress		P2	Hardware	Track	Ferréol	34.00		2/9/2025	Worksession	No	No	No	No	NA	Add the required parts of the track ahead of the qualification run
26.1	Track Design - Qualification	Design - Calculate required track material and separation	Complete		P2	Hardware	Track	Ferréol	4.00		1/26/2025	Home	No	No	No	No	NA	Separate the material, give estimate of quantity required for purchase
26.2	Track Design - Qualification	Esquisse	Complete		P2	Hardware	Track	Malo & Ferréol	10.00		2/2/2025	Worksession	No	No	No	No	NA	Draw general outline for the track, take measurements and place markings precisely before permanent
26.3	Track Design - Qualification	Réalisation	In Progress		P2	Hardware	Track	Malo & Ferréol	20.00		2/9/2025	Worksession	No	No	No	No	NA	Apply permanent markings to the track
27	Model Based Steering	4	In Progress		P1	Hardware	Path Planning	Simon			2/9/2025	Worksession	Yes	Yes	No	Yes	Embedded System	Implement computation of the steering angle based on the desired yaw. This desired yaw is computed by the use of the internal kinematic bicycle model and outputs from the MPC controller.
27.1	Model Based Steering	Understand compuation of MPC	Complete		P1	Hardware	Path Planning	Malo			1/12/2025	Home	No	Yes	No	Yes	Embedded System	Understand how the MPC controller supplies information that is used by the kinematic bicycle model, how the yaw is computed and what are the outputs of the BK4 computation

Name		Status		Logistics								Hardware Requirements					Software Requirements	Description
ID	Task	Subtask	Status	Blocking Point	Priority	Discipline	Specific Discipline	Assigned	Time Estimate	Time Taken	Update Date	Worksession/Home	Jetson Required	STM32 Required	Realsense Required	Car Chassis Required	Development Package	Description
27.2	Model Based Steering	Implement steering to compute angle from expected yaw	Complete		P1	Hardware	Path Planning	Malo			1/26/2025	Home	No	Yes	No	Yes	Embedded System	Implement a functionnality that enables the desired yaw to be sent over serial and used as an input to a function on the STM32. This function uses a PID to match the current yaw to desired yaw.
27.3	Model Based Steering	Extensive testing to tune the PID and evaluate quality	In Progress		P1	Hardware	Path Planning	Malo			2/2/2025	Worksession	Yes	Yes	No	Yes	Embedded System	Test out and tune the PID to get optimal following of the desired yaw without instability.
27.4	Model Based Steering	Implement Extended Bicycle Model	In Progress		P2	Hardware	Path Planning	Malo			3/1/2025		Yes	Yes	No	Yes	Embedded System	Replace the Kinematic bicycle model with the extended bicycle model which accounts for the vehicle's center of mass with respect to front and rear axes.
27.5	Model Based Steering	Document progress and functionality	Waiting	Dependent on prior task	P1	Hardware	Path Planning	Malo			2/16/2025	Home	No	Yes	No	Yes	Embedded System	Document the functionnality of the algorithm and evaluate the quality of the performance.
28	Jetson SSD replacement	3	In Progress		P3	Hardware	Devices	Yu Qing			2/1/2025	Home	Yes	No	No	No	Multiple	Install an SSD in place of the SD card for faster building times, responses and less computational power used up
28.1	Purchase appropriate SSD	Purchase an SSD that is compatible with the Jetson	Complete		P3	Hardware	Devices	Yu Qing			1/26/2025	Home	Yes	No	No	No	Multiple	Look into which SSDs are compatible with our model of the Jetson, and purchase the appropriate one
28.2	Clone SD card and install Jetpack	Install all dependencies for appropriate function	Complete		P3	Hardware	Devices	Yu Qing			1/26/2025	Home	Yes	No	No	No	Multiple	Clone the SD, install the appropriate Jetpack version on the SSD and make sure all required libraries and dependencies are adequately accounted for
28.3	Test all functionalities of the Jetson	Test out the Jetson with all software	Complete		P3	Hardware	Devices	Yu Qing			2/1/2025	Worksession	Yes	Yes	Yes	Yes	Multiple	Test out all the code and functionalities of the Jetson to make sure everything functions appropriately and that there are no missing dependencies
29	Object Detection Enhancement	4	Waiting	Low Priority	P2	Software	Path Planning	Xin Ya			3/8/2025	Home	No	No	No	No	Sensing	Re-train the model detection algorithm to account for the variety of scenarios in which the current model has weaknesses and to over a greater range of scenarios
29.1	Object Detection Enhancement	Identify and Summarize weaknesses	Waiting	Low Priority	P2	Software	Path Planning	Xin Ya			2/1/2025	Home	No	No	No	No	Sensing	Identify the current weaknesses of the model : i.e. which signs does it have more trouble with? At what distance is it weak from? Are there specific angles that inhibit it from detecting something?
29.2	Object Detection Enhancement	Generate or Create Data Set for Training	Waiting	Dependent on prior task	P2	Software	Path Planning	Xin Ya			2/16/2025	Home	No	No	No	No	Sensing	Create the appropriate data set for training the model to account for its current failures
29.3	Object Detection Enhancement	Formalize Test Set for Validation	Waiting	Dependent on prior task	P2	Software	Path Planning	Xin Ya			2/17/2025	Home	No	No	No	No	Sensing	Create a formal test set that contains a standardized set of images, lighting conditions, environments, positions and signs to validate and qualify the performance of the model
29.4	Object Detection Enhancement	Train the Data Set	Waiting	Dependent on prior task	P2	Software	Path Planning	Xin Ya			3/1/2025	Home	No	No	Yes	No	Sensing	Train the model using dataset augmentation.
29.5	Object Detection Enhancement	Export the model to the Jetson	Waiting	Dependent on prior task	P2	Software	Path Planning	Xin Ya			3/8/2025	Home	No	No	No	No	Sensing	Put the model on the jetson and evaluate it's detection accuracy
30	Headlight installation	4	Waiting	Low Priority	P4	Hardware	Electronics	Xin Ya			3/8/2025	Home	No	No	No	No	Embedded System	Install headlights on the car to increase the accuracy of object detection, as lower brightness may be a cause of failure to detect objects in front of it
30.1	Headlight installation	Document and Evaluate current headlights	Waiting	Dependent on prior task	P4	Hardware	Electronics	Xin Ya			2/23/2025	Home	No	No	No	No	Embedded System	Evaluate and document the current leftover headlights from the previous year. What is their specified voltage and current draw? How are the activated? How much control do we have over them?
30.2	Headlight installation	Evaluate feasibility of installation & requirements	Waiting	Dependent on prior task	P4	Hardware	Electronics	Xin Ya			2/23/2025	Home	No	No	No	No	Embedded System	Design an installation to install the headlights on the car given our current hardware and constraints
30.2	Headlight installation	Design of installation mounts	Waiting	Dependent on prior task	P4	Hardware	Chassis	Ferréol			3/1/2025	Home	No	No	No	No	Embedded System	Design a mount to install the headlights in the appropriate place so that they illuminate the appropriate sections of the field of view
30.3	Headlight installation	Install the mounts and evaluate the added benefit	Waiting	Dependent on prior task	P4	Hardware	Electronics	Ferréol			3/8/2023	Worksession	Yes	Yes	Yes	Yes	Embedded System	Install the headlights on the car and evaluate how well they work in combination with the other components.
31	Sign Detection Relocalization	4	In Progress		P1	Software	Localization	Simon			2/15/2025	Home	Yes	Yes	Yes	Yes	Planning	Adjust and tune the sign detection relocalization algorithm such that the relocalization is as accurate as can be.
31.1	Sign Based Relocalization	Simulator Testing : Find optimal height	Complete		P1	Software	Localization	Simon			2/8/2025	Home	No	No	No	No	Planning	Through testing in the simulator, find the optimal position of the realsense with respect of the car. Identify the parameters required for the accurate computation of the distance from the object.
31.2	Sign Based Relocalization	Mount Design : Design and Print	Complete		P1	Hardware	Chassis	Ferréol			2/8/2025	Worksession	No	No	Yes	Yes	Planning	Model and build a mount to install the camera at the height and angle required from the previous task
31.3	Sign Based Relocalization	Unit testing : Accuracy of solution	Complete		P1	Preparation	Testing	Malo & Simon			2/8/2025	Worksession	Yes	Yes	Yes	Yes	Planning	Test the relocalization ability of the car. First proceed with unit tests to estimate the distance and error, the procede with real running tests to see if there is a qualitatively noticeable improvement in the performance of the
31.4	Sign Based Relocalization	Analysis of results	In Progress		P1	Preparation	Testing	Malo & Ferréol			2/15/2025	Home	No	No	No	No	Planning	Minimize discrepancies, evaluate quantitatively and qualitatively the error between actual position and estimated position
32	Traffic Light Classifier	4	In Progress		P3	Software	Localization	Simon			3/1/2025	Worksession	No	No	Yes	No	Sensing	Implement an algorithm that can identify the color of the traffic light after the initial object detection has identified the traffic light.
32.1	Traffic Light Classifier	Research into available algorithms	Complete		P3	Software	Localization	Simon			2/9/2025	Home	No	No	No	No	Sensing	Research into developped methods to identify traffic lights, contour detection, optimal thresholding for the color and brightness detected
32.2	Traffic Light Classifier	Develop classifier	Complete		P3	Software	Localization	Simon			2/15/2025	Home	No	No	Yes	No	Sensing	Implement and algorithm that uses a combination of the previously identified qualifiable algorithms for our use case
32.3	Traffic Light Classifier	Unit testing, iterative tuning of classifier	In Progress		P3	Software	Localization	Simon			2/15/2025	Home	No	No	Yes	No	Sensing	Test the quality of the detection using the RealSense camera feed and iteratively tune the classifier to get the best results
32.4	Traffic Light Classifier	Integration testing on car in action	In Progress	Dependent on prior task	P3	Software	Localization	Simon			3/1/2025	Worksession	Yes	Yes	Yes	Yes	Sensing	Test the classifier on the moving car during a test run.
33.1	Frenet-Space Coordinates	4	In Progress		P3	Software	Localization	Simon			4/1/2025	Home	No	No	No	No	Planning	Transition from an absolute coordinate system to locate the positon of the vehicle to the Frenet-Space coordinate system. This will increase the flexibility of the path planning by shifting the way points relatively to the vehicle rather than relative to the track
33.2	Frenet-Space Coordinates	Understand the Frenet-Space Coordinates	Complete		P3	Software	Localization	Simon			2/16/2025	Home	No	No	No	No	Planning	Understand how the Frenet-Space is described and how changes within it are characterized
33.3	Frenet-Space Coordinates	Implement function to transition from absolute to Frenet-Space	In Progress		P3	Software	Localization	Simon			3/1/2025	Home	No	No	No	No	Planning	Implement a function to transition from the absolute coordinate system which is relative to the track, to the frenet space system which is relative to the vehicle
33.4	Frenet-Space Coordinates	Test implementation of function in Simulator	Waiting	Dependent on prior task	P3	Software	Localization	Simon			3/8/2025	Home	No	No	No	No	Planning	Test the impementation of using the frenet space system in the simulator
33.5	Frenet-Space Coordinates	Test implementation of function on real car	Waiting	Dependent on prior task	P3	Software	Localization	Simon			4/1/2024	Worksession	Yes	Yes	Yes	Yes	Planning	Once validated in the simulator, proceed to testing the functionnality of the Frenet-Space system on the real car and on the track