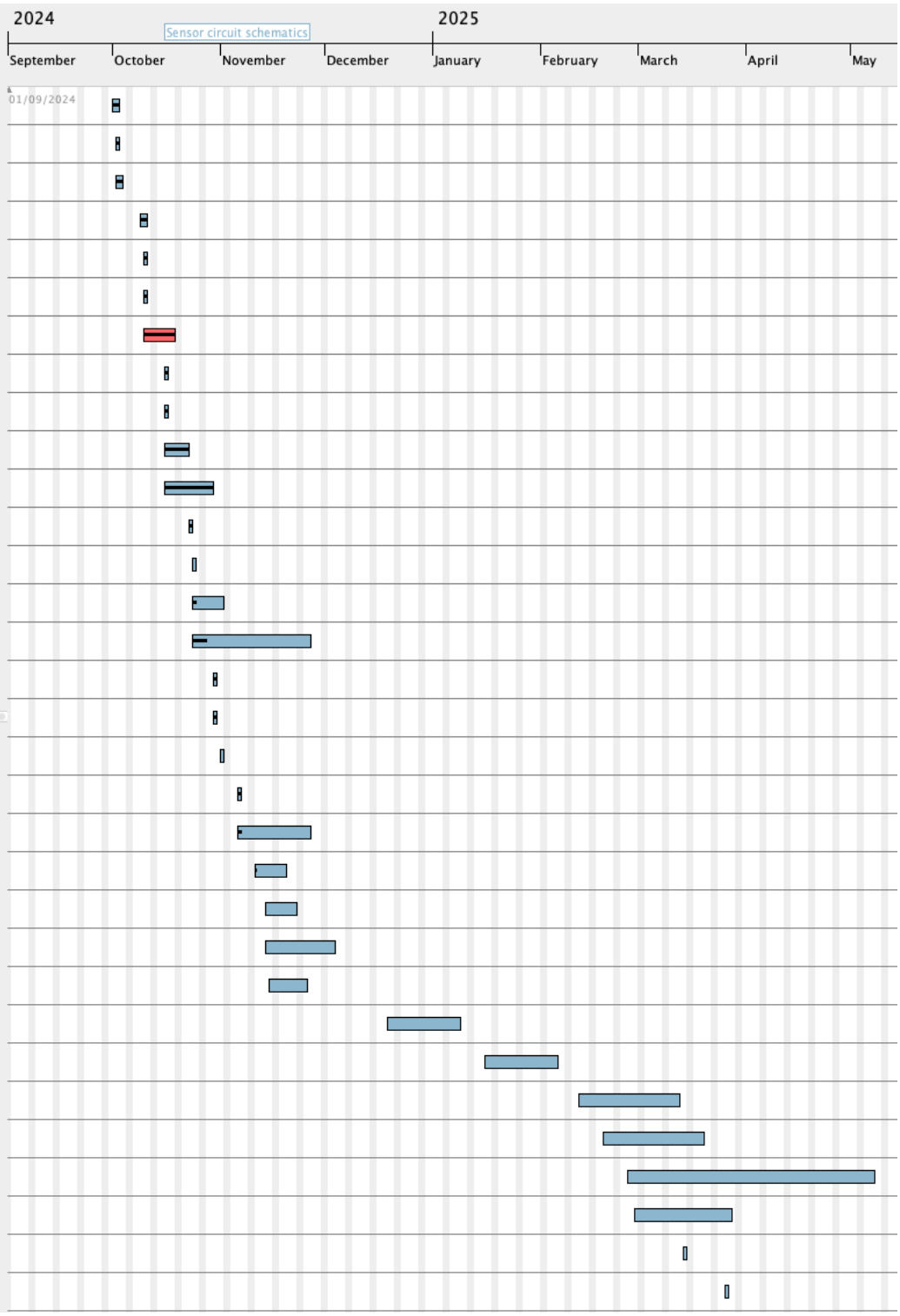
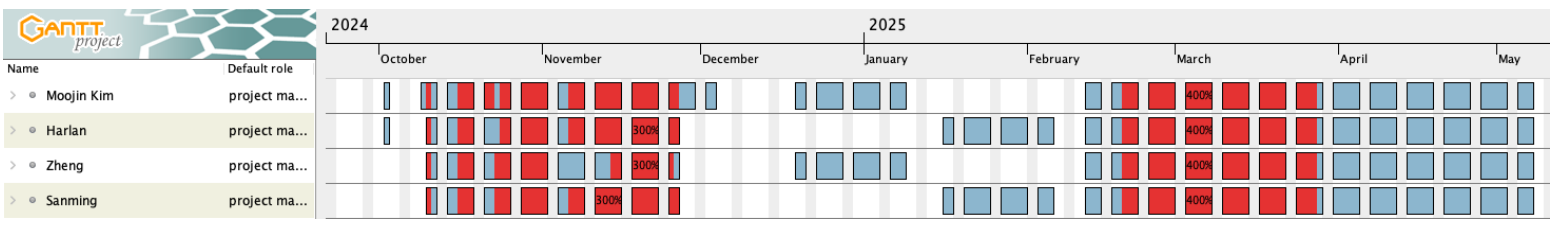
Name	Begin date	End date
Going through Procedures ...	01/10/2024	02/10/2024
Weekly journal for week 2	02/10/2024	02/10/2024
Going through Technical h...	02/10/2024	03/10/2024
Making the Gantt Chart	09/10/2024	10/10/2024
Motor lab	10/10/2024	10/10/2024
Weekly journal for week 3	10/10/2024	10/10/2024
Processing motor lab data	10/10/2024	18/10/2024
Pre-lab work for Sensors Lab	16/10/2024	16/10/2024
Weekly journal for week 4	16/10/2024	16/10/2024
Sensor circuit schematics	16/10/2024	22/10/2024
Report for motor lab	16/10/2024	29/10/2024
Weekly journal for week 5	23/10/2024	23/10/2024
Sensor lab	24/10/2024	24/10/2024
Processing sensor lab data	24/10/2024	01/11/2024
Report for sensor lab	24/10/2024	26/11/2024
Weekly journal for week 6	30/10/2024	30/10/2024
Engineering Management c...	30/10/2024	30/10/2024
Temporary Tool Rental	01/11/2024	01/11/2024
Weekly journal for week 7	06/11/2024	06/11/2024
Chassis Design	06/11/2024	26/11/2024
Software development	11/11/2024	19/11/2024
PCB Fabrication	14/11/2024	22/11/2024
Prototyping Parts	14/11/2024	03/12/2024
3D Printing	15/11/2024	25/11/2024
Calibrating sensors	19/12/2024	08/01/2025
Calibrating motor axis	16/01/2025	05/02/2025
Testing and Coding	12/02/2025	12/03/2025
Design Submission	19/02/2025	19/03/2025
Technical Demonstrations	26/02/2025	07/05/2025
Preparation for the final race	28/02/2025	27/03/2025
PCB Submission	14/03/2025	14/03/2025
Laser and Order Submission	26/03/2025	26/03/2025



Resource Management



Component	Vender	Vender No.	Cost per (£)	Qty.	Total Cost (£)
STM32 Nucleo-64 Development Board	Avnet	NUCLEO-F401RE	15.00	1	15.00
Mbed Application Shield	Farnell	2468119	42.54	1	42.54
STM32 Break out Board	Proprietary	-	10.00	1	10.00
Motor Drive Board	Proprietary	-	30.00	1	30.00
6-15V 8W DC Brushed	RS	238-9737	3.92	2	7.84
Quadrature Encoder	Farnell	2467469	21.40	2	42.80
Gearbox Box (case, gears, terminals, etc.)	UoM	-	7.00	2	14.00
Battery Holder	Farnell	3829583	2.28	1	2.28
1.2 V Rechargeable Battery	Farnell	-	2.00	8	16.00
TCRT5000L	RS	818-7524	0.77	6	4.62
Misc. Small Electronics (resistors, wires, switches, etc.)	-	-	-	-	15.00
Bluetooth Module	RobotShop	RB-Suf-03	13.53	1	13.53
Acetal Sheet 600x900x3mm	UoM	-	42.00	0.1	4.20
Ball Castor	Pololu	#955	2.47	1	2.47
Rubber Tire	Rapid	06-0654	3.92	2	7.84

The Total Estimated Final Buggy Cost: £228.12

Task	Hours/Week	Weeks	Moojin	Harlan	Zheng	Sanming	Notes
Research	4	24	96	96	96	96	Study
Meetings	2	24	48	48	48	48	Weekly
Plans	10	1	10	10	10	10	
Lab1	6	1	6	6	6	6	
DR1	5	3	15	15	15	15	
Lab2-1	3	1	3	3	3	3	
Lab2-2	3	1	3	3	3	3	
DR2	20	4	80	80	80	80	
Peer1	3	1	3	3	3	3	
Proposal	10	3	30	30	30	30	
Sdev	10	10	100	100	100	100	
TD1	6	1	6	6	6	6	Motor Control
TD2	6	1	6	6	6	6	Sensors
TD3	6	1	6	6	6	6	Control & Steering
TD4	6	1	6	6	6	6	Heats & Race
Total	1672(h)						
Payment/h	15*2(£)						50160(£)

Category	Item/Description	Unit Cost(£)	Quantity	Total Cost(£)
Materials and Components	Sensors, motors, etc.	228.12	1	228.12
Fabrication and Assembly	PCB Fabrication	30	2	60
Fabrication and Assembly	3D Printing	12+20	1	32
Tools and Equipment*	Temporary Tool Rental	5427	1	5427
Testing and Calibration	Prototyping Parts	147.05	1	147.05
Testing and Calibration	Calibration Equipment	30	1	30
Labour Costs	Labour Cost	15*2	1672	50160
Miscellaneous Costs	Shipping/Handling	15	1	15
Miscellaneous Costs	Presentation Materials	20	1	20
Miscellaneous Costs	Documentation	10	1	10
Contingency Buffer	Contingency	-	-	55

Tools and Equipment *	my DAQ	DMM	Scope	Toolkit	Soldering iron	SolidWorks	PSU	Function Generator
Cost(£)	253	1414	1339	39	199	99	1264	820
Total	5427							

The total estimated final project cost: £56184.17

MANCHESTER 1824
The University of Manchester

RISK REGISTER FOR EMBEDDED SYSTEMS PROJECT

Group Number:	27		Submission Date:	06/11/2024	
Group Members:	Moojin Kim	Harlan Sims	Zheng Xu	Sanming Xiong	

Project Risk	Severity			Potential			Score (Severity x Potential)	Mitigation Measures	Owner
	L	M	H	L	M	H	L=1, M=2, H=3		
Sensor malfunction			o		o		6	Calibrate the sensor, ensure correct distance from lines	Moojin Kim
Power supply issue			o		o		6	Monitor battery levels and fully charge before testing	Zheng Xu
Hardware component failure			o	o			3	Prepare spare parts, simulate stress test in advance	Moojin Kim
Communication fail within team		o			o		4	Set weekly meetings, use shared drive for information	Moojin Kim
Project timeline delays		o		o			2	Track progress with Gantt chart, set deadlines weekly	Sanming Xiong
Motor control inconsistency			o	o			3	Test the motor driver board before implementing by simulating code	Harlan Sims
Software failure			o	o			3	Test code regularly and save working codes separately	Zheng Xu
Environmental factors (Light)		o		o			2	Test sensors in various lighting, check data sheet	Sanming Xiong
Exceeding budget	o			o			1	Track expenses, find alternatives for expensive components	Zheng Xu
Misalignment of wheel axis		o		o			2	Ensure proper assembly, use adjustable mounts	Harlan Sims
Overheating of components		o			o		4	Monitor temperature levels, consider heatsink	Harlan Sims
Code version control issue		o		o			2	Use version controls (Github), Share code	Sanming Xiong

We confirm that all group members participated in the production of this risk register: Yes