4 Project Management

This research, commenced on August 5th, 2024, with an initial submission deadline of December 13th, 2024, later extended to January 17th, 2025. Effective project management was critical in ensuring timely delivery, adapting to challenges, and leveraging the extended timeline for refinement.

4.1 Initial planning and setup

i. Ethics Approval

Ethical approval was a critical early task, as the project involved human-action-related data and a requirement for the research. The ethics process included:

- August 27th: Submission of the MSc Project Definition Form and Ethics Declaration Form.
- September 3rd to November 15th: Application and approval process conducted via Blackboard.

This process ensured compliance with ethical research standards and facilitated uninterrupted work on the dataset.

ii. Workshops

As part of the structured curriculum, I attended a series of workshops designed to support the MSc dissertation process. These sessions provided useful guidance tailored to the project requirements:

1. Dissertation Workshops I & II (Ethics Focus): August 14th – Covered project structure and ethical requirements.
2. English Academic Writing Skills Workshop II: September 14th – Focused on writing effectively for academic purposes.
3. Dissertation Workshop III: November 29th – Offered insights on structuring and finalizing the dissertation.

These sessions helped set a strong foundation for managing the project and producing high-quality documentation

iii. Supervisor Meetings

Weekly supervisor meetings were set up to keep the project on track. Each meeting involved:

- Updates on progress pertaining to specific phases.
- Discussion of challenges and potential solutions.

- Implementation of feedback, which significantly improved my methodology and documentation.

These consistent check-ins ensured that I stayed focused and addressed any gaps early.

4.2 Execution phases

This research was organized into six phases, each tailored to address specific aspects of the study The project timeline spanned from August 5th, 2024, to January 17th, 2025, and included the following phases:

1. Research and Ethics Approval: Laid the groundwork for the research, focusing on literature review, analysis of benchmark papers, and the setup of software and hardware requirements.
2. Dataset Exploration and Preprocessing: The detailed analysis and preparation of the selected dataset was involved to ensure its suitability for the intended tasks.
3. Clustering Implementation and Parameter Tuning: Implementing and optimising DBSCAN clustering to enhance data analysis capabilities.
4. Kalman Filter and Hungarian Algorithm Integration: Focused on developing a robust motion-tracking system using advanced algorithms.
5. Evaluation and Validation: Aimed at assessing the system's performance against benchmarks and under various test conditions.
6. Documentation and Final Refinement: Dedicated to writing the dissertation, refining the findings, and integrating feedback from academic supervisors.

The project timeline, detailed in the Gantt chart below, includes key milestones and the corresponding dates for each phase. Notably, UK bank holidays were marked to reflect non-working days, and the schedule was adjusted appropriately when an extension was granted, extending the deadline to January 17th, 2025.

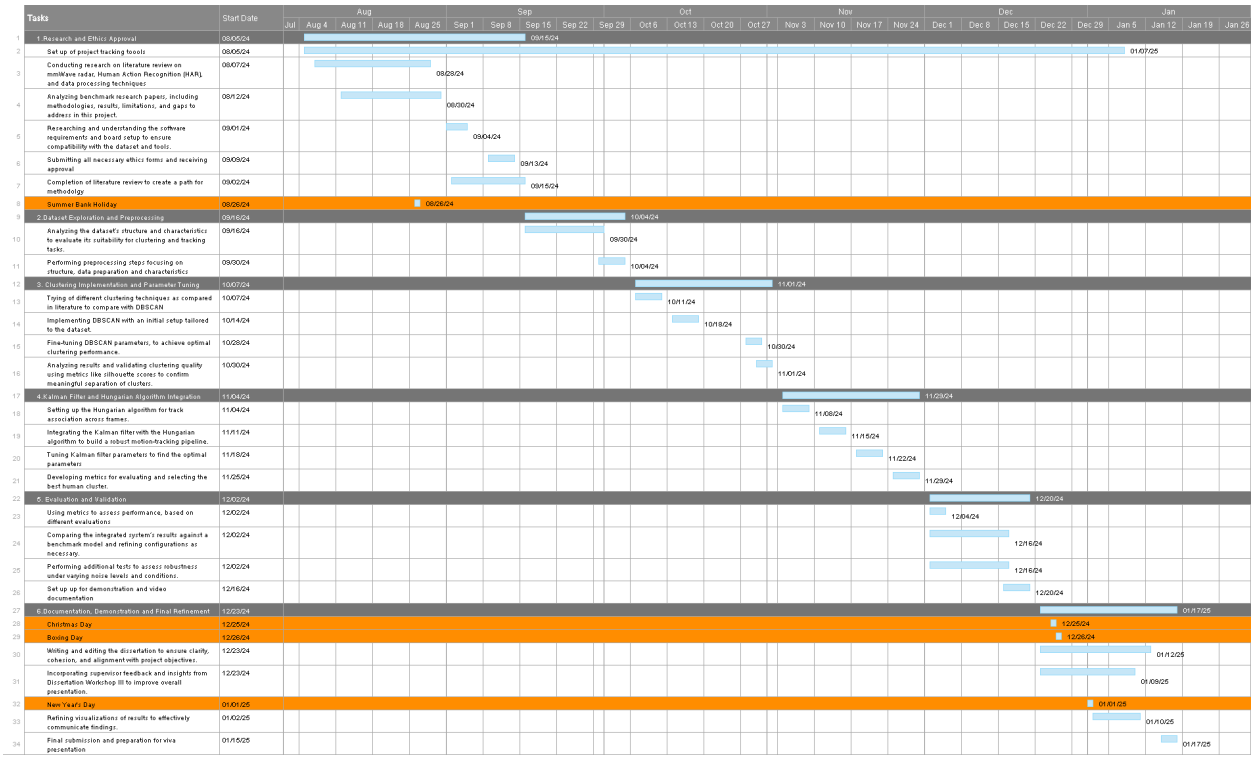

Figure 2 - Gantt chart

4.3 Adaptations and Changes

The project incorporated several key adaptations and changes to improve outcomes and respond to challenges:

1. Extension of the Timeline: The extended deadline to January 17th, 2025, enabled additional analysis, including revisiting weights analysis and more evaluation of the outcome
2. Streamlining: After critical analysis of acquired literature, the research was narrowed to focus of the highlighted data processing techniques to align with the goals
3. Refinement of Documentation: Revising the dissertation structure and visual aids to enhance clarity and impact.
4. Improved Feedback Integration: Weekly meetings with the supervisor guided iterative improvements to methodology and reporting.
5. Dataset selection: The focus shifted from custom data collection to the pre-existing milipoint dataset, eliminating procurement delays.

4.4 Risk Management

Potential risks and mitigation strategies were documented early in the project:

i. Dataset Compatibility Issues: The dataset required preprocessing to ensure compatibility with the pipeline. Adaptation of scripts from a repository simplified preprocessing.

ii. Resource Limitations: Limited memory and computational resources in Google Colab posed challenges for processing larger data stacks and running the full pipeline. Transitioning to an Ubuntu PC with a higher GPU ensured resource-intensive tasks, also reducing the stack size from 50 to 5 addressed memory constraints during initial testing.

4.5 Resource planning

Resources and technical requirements were mapped at the start:

1. Software: Python, with required libraries, were used for implementation
2. Project Management: Jira was selected for project management. Which was organised into three columns; To Do: Planned tasks for each week, In Progress: Ongoing tasks and Done: Completed tasks. Figure 3 below shows the jira board that was used:

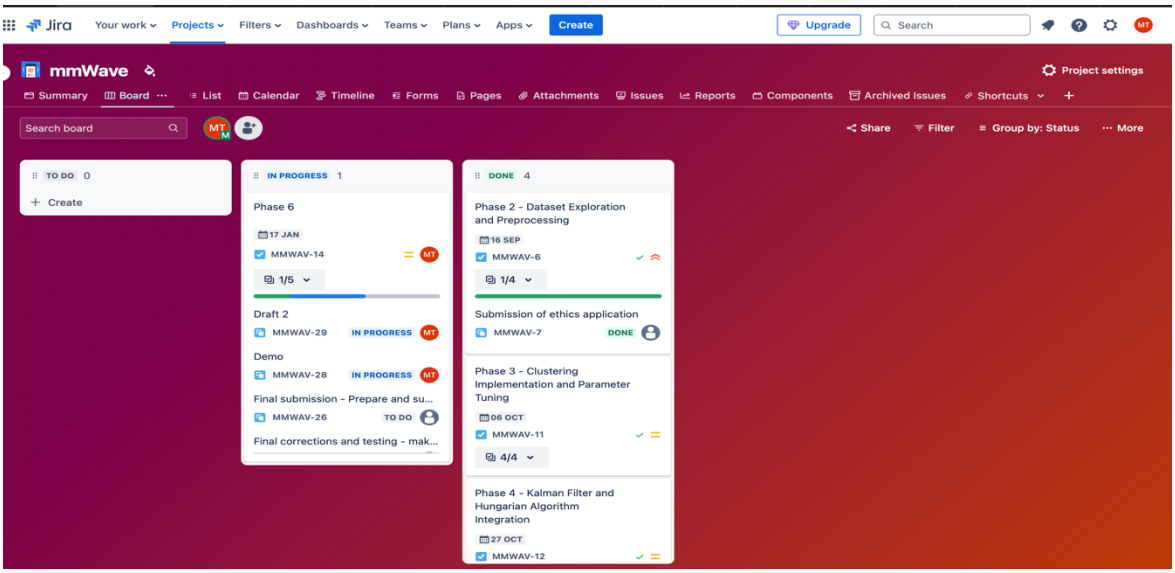

Figure 3- Jira

4.6 Quality control

Several measures were taken to maintain the quality and integrity of the pipeline:

1. Code Reviews: Regular reviews of clustering and tracking scripts ensured alignment with project objectives.

2. Validation Framework: Each pipeline component was validated individually before integration.
3. Documentation: Detailed documentation of code, methodologies, and results was maintained, ensuring reproducibility and transparency.