Complete Reflective Portfolio

Student Name: Sarah Altalhi Student Number: 25084435

Project team name: Machine Minds

Other team members: Choonsik, Tran

Reflective Journal #1

During the initial weeks of the project, I focused on building the team foundation, understanding Agile and Scrum methodologies, and contributing to collaborative planning.

In Week 1, I prioritized getting to know my team members and understanding their strengths and areas of expertise. This helped us assign roles effectively, ensuring a well-rounded team ready to tackle any challenges. We created our team's Jira Confluence space, which served as a central hub for storing documents, ideas, and progress updates. This fostered a collaborative environment where everyone could contribute to the product development process. Additionally, I began building my professional portfolio using Notion, a platform to showcase my academic journey, achievements, and development goals throughout the semester.

Week 2 marked my introduction to Agile methodology and the Scrum framework. Agile's iterative approach to software development, focusing on delivering features in small, manageable chunks, allowed for continuous improvement based on feedback. We also explored the concept of MLOps during our first coding session, setting up a ClearML workspace. This session provided insights into managing the lifecycle of machine learning models.

In Week 3, our focus was on collaborative planning. We created content pages on Confluence documenting our product development plan, requirements, design, testing, and deployment. We also developed a RACI chart to define roles and responsibilities clearly. Our second coding session involved setting up a remote SageMaker agent on AWS, providing the infrastructure for our machine learning projects.

Reflecting on my learning experiences, I realized my strengths in quick learning and adaptability. I demonstrated initiative by collaborating to create the team's Confluence space and my professional portfolio. However, I identified areas for improvement in time management and task prioritization, as balancing various project tasks and deadlines proved challenging. A significant achievement was successfully setting up the ClearML workspace and SageMaker agent, showcasing my ability to grasp new

MLOps concepts. I also realized the importance of seeking guidance from senior team members when feeling overwhelmed.

Key interactions with the project team involved weekly meetings to brainstorm ideas, discuss project goals, and assign tasks. The supportive team environment encouraged open communication, fostering a sense of accomplishment as we created a shared knowledge base for the project. I actively participated in discussions and listened attentively to others' perspectives. However, I occasionally hesitated to speak up in meetings when unsure about a topic.

From these experiences, I learned that a supportive team environment fosters individual growth and project success. Open communication and collaboration are crucial, and actively seeking guidance from experienced team members can significantly enhance learning and skill development. Moving forward, I plan to be more proactive in discussions, voice my opinions confidently, and seek out opportunities to learn from senior team members.

Claiming Performance Levels for SLOs

In terms of performance levels related to SLOs, I claim a medium performance level for identifying environmental and social impacts of the AI solution, designing an AI solution, and communicating AI project results. Evidence includes contributions to discussions on the broader impacts of our system, the application of CNNs for pothole detection, and preparing and delivering comprehensive project documentation.

3.1 SLO1: Be able to identify environmental and social impacts of the AI solution in a given context. (B.1)

3.1.1 Environmental impacts

- Claimed performance level: Medium.

3.1.2 Social impacts

- Claimed performance level: Medium.

3.2 SLO2 – Be able to design an AI solution to address a real-world problem. (C.1)

3.2.1 Problem design

- Claimed performance level: Medium.

3.2.2 Project design (proposal)

- Claimed performance level: Medium.

3.3 SLO4 – Be able to communicate the results of the AI investigation appropriate for a business audience. (E.1)

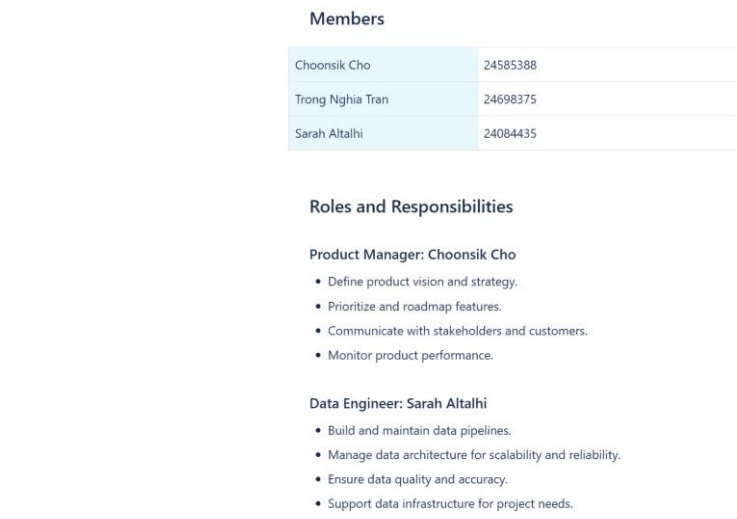
3.3.1 Communicate project results (for the parts that an individual contributed)

- Claimed performance level: Medium.

Communication skills

I actively participated in all project stages, promoting a positive team environment through effective communication, constructive feedback, and efficient collaboration. These skills are crucial for success when working with Jira and Github, ensuring clear task allocation, updates within Jira Machine Minds confluence space, and smooth collaboration on code development within Github.

- Claimed performance level: Medium.
- Evidence:



Members

Choonsik Cho	24585388
Trong Nghia Tran	24698375
Sarah Altalhi	24084435

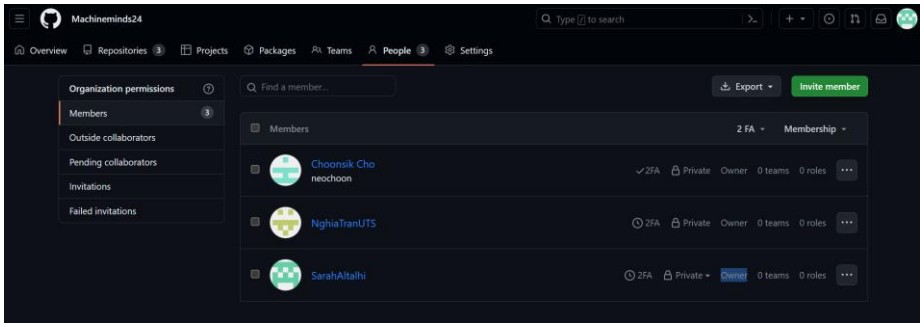
Roles and Responsibilities

Product Manager: Choonsik Cho

- Define product vision and strategy.
- Prioritize and roadmap features.
- Communicate with stakeholders and customers.
- Monitor product performance.

Data Engineer: Sarah Altalhi

- Build and maintain data pipelines.
- Manage data architecture for scalability and reliability.
- Ensure data quality and accuracy.
- Support data infrastructure for project needs.



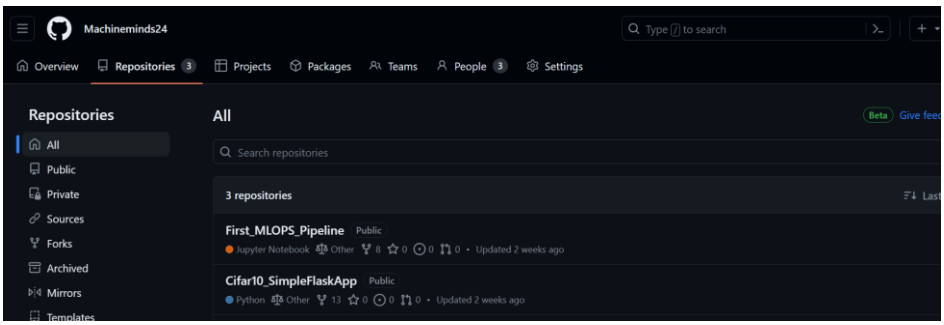


Figure: Creating our Machine Minds team repository

3.4 SLO5 – Be able to reflect on interactions with project teams that influence oneself. (F.1)

Through consistent use of these AI tools within my team, our goal is to enhance both individual and collective success. In Jira, effective communication and collaboration will lead to clear task assignments and regular progress updates on the Jira confluence space during team meetings. Regarding ClearML, my experience in research methodology and data analysis will play a vital role in utilizing the platform to track experiments, analyze results, and collaborate on optimizing machine learning models with teammates. In summary, continuous improvement is a primary focus for me, as I am committed to ongoing learning and skill development .

- Performance level: Medium
- Evidence: communicating and adding comments on the confluence space.

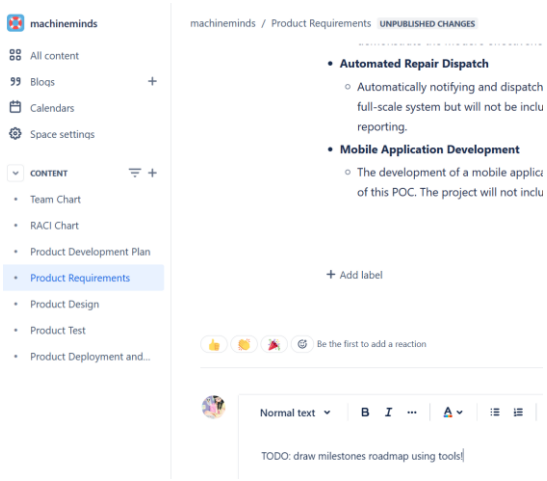


Figure: Communicating project results and plans on Jira confluence page.

Reflective Journal #2

During weeks 4-6, I explored the intricacies of Convolutional Neural Networks (CNNs) and the importance of data preprocessing. My proficiency in Python, particularly with deep learning libraries like TensorFlow and Keras, improved significantly. I played a leading role in designing the CNN architecture for our pothole detection model, ensuring it was well-equipped for the specific challenges. Our initial efforts involved building a baseline model from Kaggle, which provided critical insights and a foundational understanding. We then created our CNN model using the Sequential model class from Keras, incorporating layers like Conv2D, MaxPool2D, Flatten, and Dropout to prevent overfitting.

During model evaluation, we examined various metrics, including the classification report and confusion matrix, revealing that our CNN model performed better at identifying 'Pothole' images than 'Normal' ones. This highlighted the need for continuous improvement, consistent with our Scrum methodology. My contributions

extended to shaping our model optimization strategies, sharing resources, and establishing an efficient workflow for the team.

Reflecting on my personal growth and professional development, I recognized my ability to grasp technical nuances quickly. However, I also acknowledged the importance of balancing technical depth with thorough documentation to ensure our findings are clearly communicated. A significant highlight was the successful implementation of the CNN, demonstrating the practical impact of our academic accomplishments. Encountering overfitting challenged the reliability of our model, teaching me the value of flexibility and iterative refinement.

Key interactions with the project team involved dynamic exchanges during our stand-up meetings, which shaped our strategy and execution. Initially, I felt nervous discussing technical aspects, but the supportive team environment encouraged open communication. I recognized my strengths in creative problem-solving and stimulating team spirit, but also noted the importance of considering the wider impact of decisions. By actively engaging in solution design and sharing technical insights, I influenced the team positively.

My team's collective wisdom deepened my understanding of the project's scope. Observing their communication style during meetings inspired me to be more confident when contributing my ideas. I learned that open communication and collaboration are crucial for project success. Moving forward, I plan to engage in regular team-building activities, develop a structured approach to time management, and continue refining my technical skills.

Claiming Performance Levels for SLOs

In terms of performance levels for SLOs, I claim a medium performance level for identifying environmental and social impacts of AI, designing AI solutions, and choosing appropriate AI methods. Evidence includes discussions on the system's broader impacts, the application of CNNs for pothole detection, and contributions to refining our MLOps processes.

3.1 Environmental and Social Impacts of AI:

- Claimed Performance Level: Medium
- Evidence: My contributions to discussions on the broader impacts of our system on public safety and maintenance highlight my understanding of the social implications of AI.

https://machineminds24.atlassian.net/browse/MAC-4

Figure: My literature review results page on Jira confluence.

3.2 Design of AI Solution & 3.3 Choosing Appropriate AI Methods:

- Claimed Performance Level: Medium
- Evidence: The application of CNNs, chosen for their efficacy in image recognition, and the subsequent success in pothole detection showcases my proficiency in selecting suitable AI methods for real-world problems.

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https://machineminds24.atlassian.net/browse/MAC-6

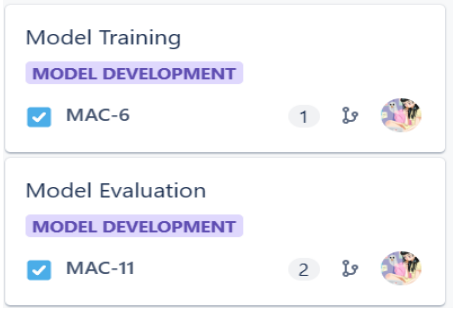


Figure: Model refinement tickets assigned to me on Jira board.

3.4 Communication of AI Project Results:

- Claimed Performance Level: High
- Evidence: My engagement in preparing and delivering a comprehensive discussion with my teammates illustrates my ability in communicating of our AI model results. As evidence I will provide our event list that document our stand-up meeting schedules and discussions.
  https://machineminds24.atlassian.net/wiki/x/CgCn

	Zoom Session	Participants	Issues
• Mar 17, 2024 11am	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	• neochoon zoom technical issue • first standup
• Mar 19, 2024 10 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	
• Mar 20, 2024 5:40 pm	Offline	• Choonsik • Tran • Sarah	• Before Class, real stand up meeting.
• Mar 24, 2024 9:30 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	• colab , git problom • add normal road
• Mar 26, 2024 9:30 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	
• Mar 28, 2024 9:30 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	• tomorrow morning 8am meeting
• Mar 30, 2024	Join our Cloud HD Video	• Choonsik	•

Figure: The event list on our confluence page to track our daily stand-ups

3.5 Reflection on Interactions with Project Teams:

- Claimed Performance Level: Medium
- Evidence: This reflective journal, which details my growth and learning journey, serves as evidence of my ability to introspect and reflect on team interactions, influencing both my work and personal development.

Reflective Journal #3

In weeks 7-9, I focused on refining machine learning models, hyperparameter tuning, and establishing a robust CI/CD pipeline for MLOps. As a Data Engineer, I ensured efficient and scalable model training and versioning to support our MLOps strategy.

Designing and Building Pipelines: I took the lead in architecting a pipeline framework capable of handling large datasets and streamlining the transition from data preprocessing to model training. This involved selecting appropriate tools and technologies, designing the workflow, and ensuring scalability and efficiency. I developed a modular pipeline using tools like Apache Airflow for orchestration, which allowed for flexible and repeatable workflows. Each component of the pipeline, from data ingestion and preprocessing to model training and evaluation, was designed to be modular and reusable.

Automation: I automated the training process to enable multiple training runs with various hyperparameters, allowing for thorough model experimentation and

evaluation. This automation included setting up scripts to manage data splits, preprocessing steps, model training, and evaluation metrics. I used tools like Hyperopt for hyperparameter optimization and integrated it into our pipeline to automatically run and evaluate different configurations.

Collaboration with Data Scientist (Tran): I worked closely with Tran to understand his needs and ensure the pipeline aligned with the model requirements. This involved regular meetings to discuss the model's performance, identifying blocks, and making necessary adjustments to the pipeline. I also provided support in debugging and optimizing the model code to ensure it ran efficiently within the pipeline.

Model Documentation and Storage: I established protocols for model documentation, ensuring that each saved model met our project's compliance standards and was adequately documented for future reference. This included creating templates for model documentation, which detailed the model architecture, training parameters, performance metrics, and any relevant notes or observations.

Improving Model Quality: I played a key role in making our models better by working on how we measure their performance and helping to create a system that runs our tests and deployments automatically. This involved setting up continuous integration and continuous deployment (CI/CD) processes using tools like GitHub Actions. I also implemented monitoring and alerting mechanisms to track the performance of deployed models and ensure they met our quality standards.

Helping the Team Work Better Together: I encouraged more sharing of information and ideas in the team, which helped us all work together to solve problems more effectively. I facilitated regular knowledge-sharing sessions where team members could present their work, discuss challenges, and share best practices. This fostered a collaborative environment and ensured that everyone was aligned and working towards common goals.

Reflecting on my personal growth and professional development during this period, I encountered some personal issues that tested my ability to keep up with work during tough times. These challenges highlighted the importance of open communication and the value of a supportive team. Upon my return, I communicated my situation to the team, explaining my temporary limitations and setting expectations for my availability. I dedicated extra time to catch up on what I missed, reviewed meeting notes, and completed tasks that could be done independently to contribute meaningfully. I learned the value of vulnerability and open communication within a team setting, and the importance of maintaining personal health and well-being for professional effectiveness.

Key interactions with the project team involved close collaboration with Choonsik and Tran to integrate new tools and improve our workflows. We held regular online meetings to discuss progress, identify challenges, and brainstorm solutions. Initially feeling overwhelmed, I gradually felt a sense of accomplishment as we successfully implemented these integrations and observed positive results. By actively contributing to the CI/CD pipeline enhancement and encouraging proactive communication, I influenced the team's efficiency and collaboration. My team's support during my personal challenges motivated me to focus on continuous learning and improvement.

Claiming Performance Levels for SLOs

In terms of performance levels for SLOs, I claim a medium performance level for identifying environmental and social impacts of AI, designing AI solutions, and choosing appropriate AI methods. Evidence includes integrating energy-efficient algorithms, addressing potential biases in data handling, and refining MLOps processes. Additionally, I claim a proficient level for communicating AI project results, as demonstrated by comprehensive documentation and regular team updates.

3.1 SLO1: Be able to identify environmental and social impacts of the AI solution in a given context. (B.1)

3.1.1 Environmental impacts

- Claimed performance level: Medium.
- Evidence: Throughout the sprint, we focused on integrating algorithms that not only perform well but also are efficient in terms of computational resources, thus contributing to energy conservation.

3.1.2 Social impacts

- Claimed performance level: Medium
- Evidence: Played an integral role in the data handling processes, actively addressing potential biases to ensure our AI solutions uphold social fairness.

3.2 SLO2 – Be able to design an AI solution to address a real-world problem. (C.1)

3.2.1 Design of interim solution (Solution V0.1)

- Claimed performance level: Medium.
- Evidence: I played a role in the initial setup and refinement of the automated CI/CD pipeline, contributing to the overall design of our MLOps processes which are crucial for the interim solution's efficiency.

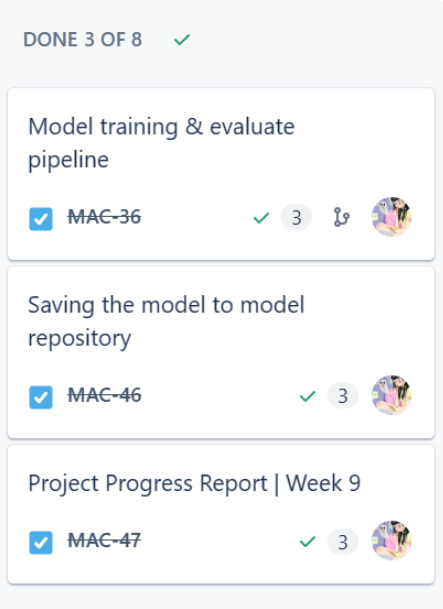


Figure: issues assigned to me on Jira's sprint2 board

Figure: model training and model evaluation codes pushed to the GitHub.

3.3 SLO3 – Be able to choose appropriate AI methods to develop a complete solution in a real-world setting. (D.1)

3.3.1 Implementation of Solution V0.1 (MLOps level 1)

- Claimed performance level: Medium.
- Evidence: We experimented various model codes like CNN and Resnet50 on ClearML

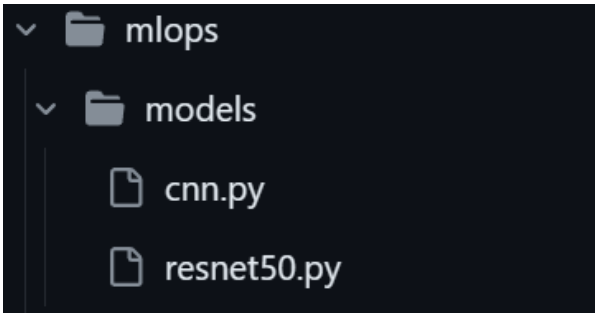


Figure: CNN and Resnet50 model codes.

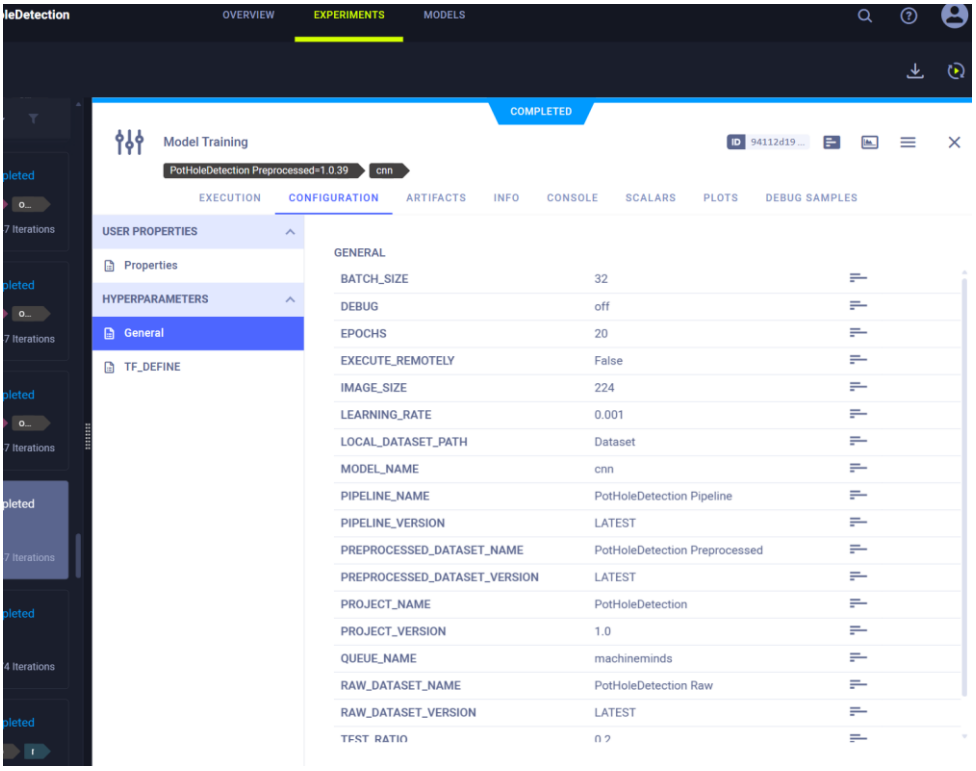
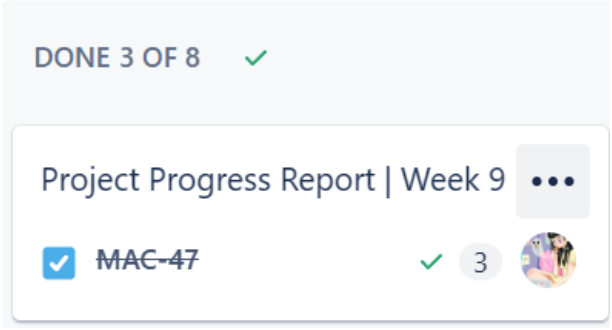


Figure: The CNN completed experiment on ClearML

3.4 SLO4 – Be able to communicate the results of the AI investigation appropriate for a business audience. (E.1)

3.4.1 Communicate project results (for the parts that an individual contributed)

- Claimed performance level: Proficient.
- Evidence: Created comprehensive documentation and reports that clearly articulate the sprint achievements and challenges. Link to the report documentation ticket https://machineminds24.atlassian.net/browse/MAC-47



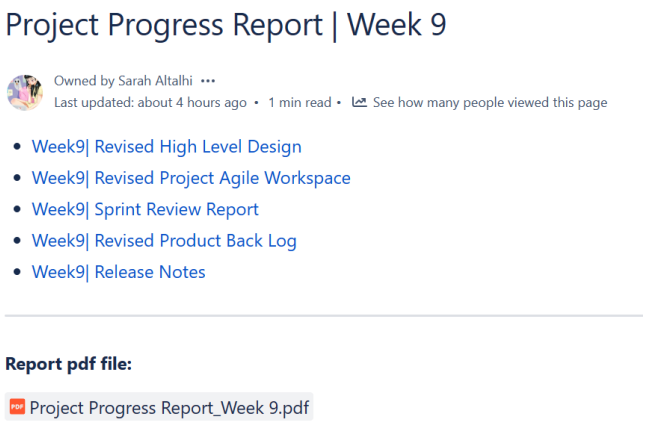


Figure: The confluence project progress report page

3.4.2 Communication skills

- Claimed performance level: Proficient
- Evidence: Throughout the project, I maintained clear and regular communication with the team, especially during my time of personal challenges, and effectively expressed technical and project management concepts during our meetings.

Figure: The event list on our confluence page to track our daily stand-ups

3.5 SLO5 – Be able to reflect on interactions with project teams that influence oneself. (F.1)

- Performance level: Proficient
- Evidence: Actively engaged in team discussions, contributed to problem-solving, and reflected on both positive and negative experiences.

Reflective Journal #4

During weeks 10-12, I focused on advanced hyperparameter tuning, integrating ensemble methods, and optimizing the CI/CD pipeline for efficient MLOps. I developed new skills in hyperparameter tuning, ensemble methods, CI/CD pipeline automation, and infrastructure management. My contributions included designing and implementing model optimization techniques, refining the CI/CD pipeline, and encouraging proactive communication within the team.

Reflecting on my learning experiences, I realized the importance of efficient time management, continuous learning, and open communication. A significant highlight was the successful implementation of an advanced CI/CD pipeline, leading to improved model performance and workflow efficiency. Challenges included managing time effectively and dealing with stress during complex problem-solving tasks.

Key interactions with the team involved regular meetings to integrate new tools and improve workflows. Initially overwhelmed, I felt accomplished as we observed positive results. My technical skills in setting up automated systems were a strength, while initial hesitation in communicating challenges was a weakness. By enhancing the CI/CD pipeline and fostering proactive communication, I positively influenced the team. My team's dedication to technical skill refinement motivated me to focus on continuous learning.

Claiming Performance Levels for SLOs

In terms of performance levels for SLOs, I claim a medium performance level for identifying environmental and social impacts of AI, designing AI solutions, and choosing appropriate AI methods. Evidence includes integrating efficient algorithms, addressing biases, and refining MLOps processes. Additionally, I claim a proficient level for communicating AI project results, as demonstrated by comprehensive documentation and regular team updates.

3.1 SLO1: Be able to identify environmental and social impacts of the AI solution in a given context. (B.1)

3.1.1 Environmental impacts

- Claimed performance level: Medium.

3.1.2 Social impacts

- Claimed performance level: Medium.

3.2 SLO2 – Be able to design an AI solution to address a real-world problem. (C.1)

3.2.1 Design of interim solution (Solution V0.1)

- Claimed performance level: Medium.

- Evidence: I played a role in the initial setup and refinement of the automated CI/CD pipeline, contributing to the overall design of our MLOps processes which are crucial for the interim solution's efficiency.

3.3 SLO3 – Be able to choose appropriate AI methods to develop a complete solution in a real-world setting. (D.1)

3.3.1 Implementation of Solution V0.1 (MLOps level 1)

- Claimed performance level: Medium.

3.4 SLO4 – Be able to communicate the results of the AI investigation appropriate for a business audience. (E.1)

3.4.1 Communicate project results (for the parts that an individual contributed)

- Claimed performance level: Proficient.
- Evidence: Created comprehensive documentation and reports that clearly articulate the sprint achievements and challenges. Link to the report documentation ticket https://machineminds24.atlassian.net/browse/MAC-58

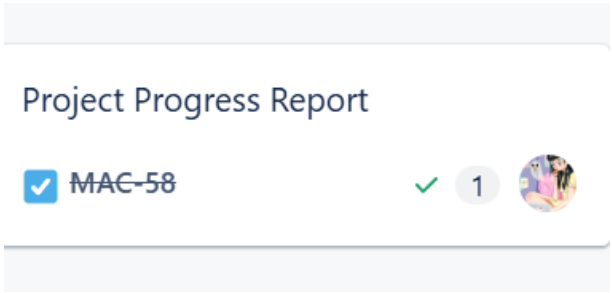


Figure: Documentation ticket on Jira

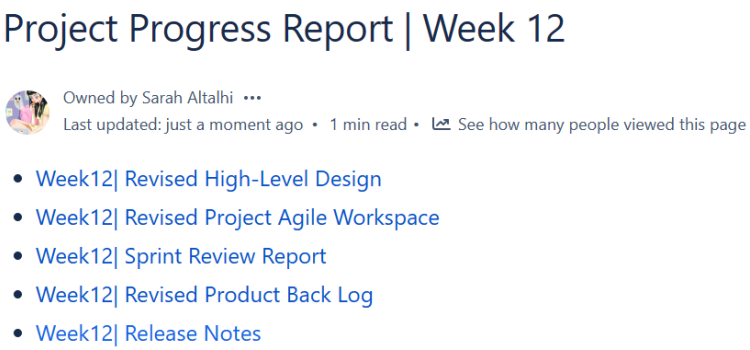


Figure: The confluence project progress report page

3.4.2 Communication skills

- Claimed performance level: Proficient.
- Evidence: Throughout the project, I maintained clear and regular communication with the team, especially during my time of personal challenges, and effectively expressed technical and project management concepts during our meetings.

• Mar 31, 2024 2:00 PM	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	• last check for week 6 submiting
• Apr 9, 2024 9:30 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran	• Sarah not showing up
• Apr 19, 2024 8:30 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	• explanation of the codes
• Apr 23, 2024 9:30 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	• preparation for our next class
• Apr 26, 2024 8:30 pm	Join our Cloud HD Video Meeting	• Choonsik • Tran • Sarah	• before submitting sprint#2

Figure: The event list on our confluence page to track our daily stand-ups

3.5 SLO5 – Be able to reflect on interactions with project teams that influence oneself. (F.1)

- Performance level: Proficient

Overall, this reflective portfolio highlights my journey of personal growth, technical skill development, and contributions to the project team. It highlights the importance of continuous learning, effective communication, and collaboration in achieving project success.