



Reflection and E-Portfolio Report for Machine Learning Module

Student ID: 12697857

Module: Machine Learning

GitHub Repository URL: <https://fahadsaleh19.github.io/E-Portfolio/machine-learning.html>

Date: 20 July 2025



Reflective Of Machine Learning Module

Student ID: 12697857

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1. Introduction

This machine learning reflection covers my journey through my course about machine Learning: Foundations and Concepts by Bishop et al. (2024) which introduced core ideas such as neural networks, activation functions, convolutional along with recurrent models, unsupervised learning, reinforcement learning as well as ethical implications of artificial intelligence (AI) (Bishop et al., 2024). I structured this reflection around Rolfe et al.'s three-part reflective model—What? So What? Now What? (Rolfe et al., 2001) and incorporated Gibbs' Reflective Cycle to examine my emotions, evaluation, and action planning. This reflection not only assesses my cognitive understanding of technical concepts but tracks my emotional responses, evolving confidence, and professional growth in AI and ethical practice.

2. Description of Experience (What?)

Before this module, I only knew a little about artificial intelligence. In Unit 1, I learned about the history of AI and machine learning. The early lessons gave me a strong base. I was introduced to things like linear classifiers, activation functions, and network structures. I learned about forward propagation, gradient descent, and overfitting. At first, I thought these were just complex math ideas. But I soon saw they are very important to how AI models work.

Units 2 to 5 helped me understand more. I learned how backpropagation and regularisation work. The lessons explained them clearly, which helped me a lot. Units 6 and 7 were exciting but hard. I studied Convolutional Neural Networks (CNNs) and saw how they help machines “see” images. I learned about Recurrent Neural Networks (RNNs) which can remember past data. These topics helped me connect the theory with real tasks. Now, I understand how machines can recognise objects and translate languages.

Unit 8 taught me about autoencoders and unsupervised learning. Before this, I thought learning always needed labels or guidance. But this unit showed me that AI can learn without that. The unit on Generative Adversarial Networks (GANs) was very exciting. I saw how AI can create art, images along with other media. It made me think about new creative uses for AI. Units 10 to 12 were about reinforcement learning and AI ethics. I learned how AI makes decisions by learning from rewards. These units talked about bias and fairness in AI. This made me stop and think. I saw that AI can sometimes repeat the unfair parts of society. I learned how important it is to make AI fair and clear. Now, I understand that AI needs to match human values and be used carefully (Caliskan et al., 2017).

3. Reflection and Emotional Response (So What?)

At first, I was overwhelmed by the mathematical complexity and unfamiliar terminology. Like students in statistics modules (Miller et al., 2024), I felt “algorithm anxiety.” I wasn’t sure I could understand things like gradient descent or softmax layers. Gibbs’ model helped me see that feeling stuck is part of learning. I felt frustrated in Unit 3. But later, I felt proud. I built my first multi-layer perceptron in Python. It could classify images. These emotional shifts mirrored Pekrun’s control-value theory which links achievement emotions to personal agency and task value (Pekrun et al., 2006).

Ethical content from Unit 11 had a profound emotional impact. I was startled by examples of AI bias such as facial recognition models misclassifying people of color (Buolamwini et al., 2018). This challenged my belief that algorithms were inherently neutral. According to Rolfe et al. (2001), critical reflection should lead to deeper ethical questioning and I found myself asking: What values are embedded in the data we use? Who gets to decide?

Reinforcement learning made me see how AI and humans both follow rewards. But AI can take strange shortcuts to get them ones we wouldn't accept. This shows that reward systems must be designed carefully (Russell, 2019). I found this intersection between AI design and human psychology both fascinating and concerning. It made me realize how "success" in AI must be carefully defined to avoid unintended consequences (Du et al., 2020).

Reading GAN literature made me reflect on machine creativity. I was amazed that network could generate art and it made me question whether creativity is uniquely human. This aligns with Stadelmann et al. (2025), who argue that humanities must engage in defining machine-generated meaning (Segessenmann et al., 2025).

4. Lessons and Future Application (Now What?)

I now approach machine learning not only as a technical domain. But as a space where ethics, culture along with policy intersect. In future projects, I intend to apply CNNs to medical image classification but with a stronger awareness of dataset bias and performance disparities (Du et al., 2020). I plan to build prototype image classifier using PyTorch and test it on publicly available datasets, documenting its accuracy and fairness metrics.

I will integrate inverse reinforcement learning (IRL) to explore how agents can learn from human values, an area emphasised by Oliveira et al. (2023). My goal is to ensure that the AI tools I contribute to align with human ethics. Especially in culturally diverse contexts.

I have set a SMART goal: "Complete a GAN-based art project and check it for social bias by December 2025." I will join AI ethics forums. This will help me learn about fairness, transparency, and values in AI. I will use Rolfe's model each month to reflect. I will record my progress in an e-portfolio.

5. Conclusion

This reflective report talks about my journey through the course Machine Learning: Foundations and Concepts. I used Rolfe et al.'s and Gibbs' reflective models to guide my thinking. At first, I thought the course would be only technical. But it became much more than that. It helped me think deeply about emotions, ethics, and human values. I became more confident with technical skills. I learned the importance of designing AI that helps people. I explored the ethics behind AI. I learned how to understand models better. I took time to reflect on what I learned. Now, I see machine learning in a new way. It is not just about numbers and code. It is about purpose, values along with the impact on people. This course helped me grow as a learner and as a responsible person in the field of AI.

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E-Portfolio Report

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1. Introduction

This report is a reflection on how I created and submitted my personal e-Portfolio. It was part of the Machine Learning module at the University of Essex. My e-Portfolio is hosted on GitHub. It shows my learning each week. I focused on digital ethics, tech skills, and academic honesty. I paid special attention to how to use Generative AI (GenAI) tools in a responsible way.

During the term, I took part in guided tasks and worked on my own. I worked with other students and tried out GenAI tools. I recorded all of this in my GitHub account. I used markdown files, folders, and version control to keep everything organised. This report adds to what I showed on GitHub. It tells the full story of my learning. I talk about how I improved, the problems I faced, and the ethical questions I thought about. I share my thoughts on how GenAI tools might affect my future in school and work.

The reflective framework guiding this report is based on the model by Rolfe et al. (2001), which prompts critical reflection through the three questions: What? So what? Now what? Additionally, the work of Corrêa et al. (2023) offers an essential ethical foundation, helping to contextualize the moral complexities associated with GenAI use.

2. Description of the e-Portfolio Work

My e-Portfolio is on GitHub in a public repository. I made it during Week 1 of the module. The repository has folders for each week. Inside each folder, there are markdown (.md) files. These files talk about what I learned, key points, ethical thoughts, and activities related to GenAI. There is a main README.md file. It explains the purpose of the project. It has links to each week's reflections, so it's easy to find and read them.

The core contents of the e-Portfolio include:

- Reflective responses to classroom discussions and assigned readings.
- Ethical evaluations of hypothetical and real-life GenAI use cases.
- Experiments with tools such as ChatGPT, DALL·E, and GrammarlyGO.
- Comparative analyses of AI-generated vs. human-authored content.
- Prompt engineering exercises and critical output analysis.
- Weekly summaries, screenshots, annotated outputs, and concluding reflections.

I added screenshots of my GenAI chats to show my process clearly. These images help support my reflections. I used GitHub for this project. It helped me improve my digital skills. I learned how to use version control, format in markdown, and organize files. I learned how to work with others on one platform. Most importantly, I saw how ethics and technology can come together in practice.

3. Key Learning Outcomes

3.1 Technical Proficiency and Digital Literacy

One important result of this project was learning useful digital skills that I did not have before. At the start, I had very little experience with GitHub. I didn't really understand how it worked. But as the weeks went on, I learned how to manage files, create and update repositories, and organize my work in a clear way. I learned how to use markdown to format text, which helped me write my weekly reflections in a neat and professional style. These skills made my work look more organised and easier to read.

Another key part of the project was using GenAI tools like ChatGPT. This helped me understand how to ask better questions and how to look at the answers more carefully. In Week

4, I tried using ChatGPT to summarise an academic article. The summary was helpful, but I noticed that it sometimes left out important details. This made me realize that I couldn't rely only on AI. So, I started checking the AI's answers by comparing them with the original text. This new method helped me make sure the information was correct. It showed me how to use AI tools in a smart and responsible way.

3.2 Critical and Ethical Thinking

One big area where I grew was in thinking more deeply about how GenAI is used. At first, I thought tools like ChatGPT were just helpful for ideas or starting drafts. But during the module, I began to ask bigger questions. I started to think about things like misinformation, bias, and who really owns the work that AI helps create.

Corrêa et al. (2023) say that GenAI can sometimes support harmful ideas or repeat unfair patterns. This is because it learns from huge amounts of data that are not always checked or fair. This made me think more carefully about the answers I got from ChatGPT. I noticed this especially when I asked it about topics like gender, race, or world history.

For example, I asked ChatGPT to write about African history. The answer it gave focused mostly on Western views. It left out important work by African scholars. This helped me see that technology can sometimes ignore or forget certain voices. It showed me why it's important to question and check what GenAI tools say.

3.3 Academic Integrity and Responsible AI Use

The topic of academic integrity became very important in my learning. At first, I did not fully understand the rules about using AI tools like ChatGPT. I later learned that being honest and giving credit is very important. The University of Essex Academic Integrity Policy (2023)

helped me understand what is allowed and what is not. It explained how to use AI in the right way, with proper citations.

In Week 6, I used ChatGPT to help me write an introduction for a reflection. The paragraph was clear, but it did not sound like me. It felt too general and not personal. So, I changed it a lot and added my own thoughts. I added a note to say that I used ChatGPT at the start. This experience taught me a lot. I learned that AI can help, but it cannot replace my own ideas. Writing is more than good grammar. It is about thinking deeply and being honest. I believe the real author is the person who works hard, thinks carefully, and follows ethical rules.

4. Ethical Reflection and Use of Generative AI

The ethical issues of using GenAI in education are big and complex. One key idea I often think about is the balance between ease and responsibility. GenAI tools are fast and can give new ideas. But they come with risks. These include copying others' work (plagiarism), repeating unfair ideas (bias), and being unclear about how the answers are made. Corrêa et al. (2023) say that one major problem is that GenAI is not transparent. This means users don't really know how the tool makes its answers. Because of this, it's hard to check if the content is correct or fair.

This made me change how I use AI. I don't just accept the answers. I ask questions like: What is this answer based on? Who is included or left out? Is this content fair for all cultures or groups? Now, I try to think more critically. I look deeper at what the AI gives me. In Week 8, I reflected on how GenAI systems often marginalize non-Western knowledge systems. After noticing that ChatGPT provided a limited perspective on Eastern philosophies compared to Western frameworks, I adjusted my prompts to be more inclusive and sought supplemental

sources written by scholars from diverse backgrounds. This moment illustrated that ethical AI use requires not just technical skill but cultural awareness.

Another ethical problem was about becoming too dependent. GenAI tools are now part of our daily work. This can make people rely on them too much. I tried to use AI but not all the time. I made sure to think for myself. I wrote my own reflections and did my own analysis. The module taught us that AI should help us learn. It should not do the work for us.

5. Future Applications and Development

The lessons I learned in this module will help me in my studies and future career. In my next courses, I will keep using GenAI tools to help with ideas and planning. I will always be honest about when I use them. I want to learn how to write better prompts so the AI gives clear, fair, and inclusive answers.

Outside of school, I know that GenAI skills are now important in many jobs. People working in data, writing, or customer service will need to use AI tools. This module helped me understand how to use AI in a fair and ethical way. I now feel ready to work in teams that care about using technology responsibly.

I have already started looking at extra courses on topics like digital ethics and safe AI design. In the future, I hope to work in tech policy or become an ethics advisor. I want to make sure that AI is used in a way that puts people first.

To continue my growth, I have set the following SMART goals:

- **Specific:** Complete a certified online course on ethical AI design by the end of the year.
- **Measurable:** Document all AI interactions and reflect on ethical use in a monthly learning log.

- Achievable: Dedicate two hours weekly to AI ethics readings and discussions.
- Relevant: Focus on applications in education, research, and user-centered design.
- Time-bound: Achieve these targets by the end of the current academic year.

6. Conclusion

Creating my e-Portfolio has been a powerful learning experience. At first, I was just learning how to use digital tools. But over time, I started thinking more deeply about bigger ideas like responsibility, fairness, and how we use AI.

I used GitHub to keep track of my work. I completed weekly tasks and wrote reflections using the Rolfe et al. (2001) model. This helped me think more clearly about what I was learning. I began to understand that every time we use AI, we make an ethical choice. Corrêa et al. (2023) helped me see that.

Now, I know how to use AI tools better. But more importantly, I've learned to use them with care and honesty. I want to make sure that AI helps people learn and grow. I don't want it to replace human thinking or take away fairness and respect. As AI keeps changing our world, I hope to use it in ways that are fair and helpful for everyone.

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