1. Theoretical Analysis of DreamSpace

DreamSpace is an exploratory design project that investigates how artificial intelligence may assist users in recording, understanding, and visualizing their dreams. The project is grounded in the assumption, widely discussed in psychology, linguistics, and human–computer interaction, that dreams can be approached as a form of symbolic language. “language is a symbol system,” and dreams similarly rely on metaphor, condensation, and emotionally charged imagery to communicate latent meanings. By treating dream reports as natural language inputs, DreamSpace enables computational models to transform symbolic expressions (e.g., “dark room,” “falling,” “ocean”) into internal representations that approximate the user’s subconscious narrative.

From the perspective of natural language processing (NLP), NLU modules extract keywords, emotional signals, and recurrent themes from dream descriptions. NLG components then produce interpretive summaries or visualization prompts that support symbolic reflection rather than deterministic explanation. This is consistent with contemporary HCI approaches that frame AI not as an oracle providing answers, but as a partner that augments human meaning-making.

Dreams also represent a compelling test case for uncertain reasoning. Classical psychoanalytic and cognitive literature emphasizes that dream content is often vague, ambiguous, and resistant to singular interpretation. In this sense, dreams resemble what computer scientists describe as ideal uncertain texts: meaning is distributed, multi-stable, and context dependent. Following “probability as truth-value”, DreamSpace does not aim to deliver fixed or authoritative interpretations. Instead, the system produces multiple symbolic suggestions, confidence-weighted patterns, and optional re-analysis when users add new details. This probabilistic framing aligns with current research on large language models, which treat meaning as an inference task rather than a discrete retrieval problem.

Although some envisioned features (such as 2D/3D dream reconstruction) extend beyond what is technically feasible in the current prototype, they provide a conceptual direction for future work in AI-mediated imagination. As such, this project combines practical development—interface design, sample code, and working NLP components—with theoretical reflections on dream documentation, memory, and human–AI interaction. DreamSpace ultimately seeks to create a poetic yet rigorous space in which users can engage with their inner narratives through computationally assisted interpretation and visualization.

2. What I have learned from this course

According to the assignment instructions, we are expected to describe our project as a learning process, including the problems we encountered and the lessons we learned. For me, this was a particularly meaningful journey.

First, given my very limited background in computer science, I faced numerous difficulties throughout the development process. However, with the support of the professor and, more importantly, with the assistance of artificial intelligence itself, I was able to overcome many challenges. This experience demonstrated to me the remarkable power of AI today: it enables students with no programming experience to build functional web applications. Someone who knew nothing about coding was able to generate working code, fix issues, and iterate on a real system. Although I frequently encountered bugs and often had no idea how to solve them on my own, to my surprise, much of the process went more smoothly than I expected.

Second, I have learned a great deal from this course. To be honest, there were moments when I felt that I understood 80% of the lectures, but I also knew that my understanding was superficial because so much of the foundational knowledge was unfamiliar to me. Even without a proper background in most of the concepts

covered, I tried my best to complete each assignment, and I used AI as a learning assistant to study advanced material that would otherwise be inaccessible to me. With this help, I not only managed to finish my project, but also realized my personal dream of creating my own application. Although my project is not technically sophisticated, it reflects my effort and growth, and I am proud of what I achieved given my starting point.

I feel pity that I didn't dig as deep as I imagined due to time limitation and the difficulty of this course, but I do think this course gave me a very meaningful start to really consider AI from a professional perspective. In the future, I hope there will be some opportunities for me to use what I have taken in this course and build up stronger and more fundamental knowledge in Artificial Intelligence.

Ultimately, this experience not only helped me to interact more effectively with AI, understand the basic ideas and theories behind artificial intelligence , but also helped me learn how and believe in my ability to create something meaningful even without a technical background.

3. References

[1] Zulfikar, W., Chiaravalloti, T., Shen, J., Picard, R., & Maes, P. (2025). Resonance: Drawing from memories to imagine positive futures through AI-augmented journaling. arXiv preprint arXiv:2503.24145. https://arxiv.org/abs/2503.24145

[2] Liu, P., Lee, K. J., Steinmaurer, A., Picard-Deland, C., Carr, M., & Kitson, A. (2025). DreamLLM-3D: Affective dream reliving using large language model and 3D generative AI. arXiv preprint arXiv:2503.16439. https://arxiv.org/abs/2503.16439

[3] McNamara, P., Duffy-Deno, K., Marsh, T., & Marsh, T. (2019). Dream content analysis using artificial intelligence. International Journal of Dream Research, 12(1), 42–52. https://doi.org/10.11588/ijodr.2019.1.48744

[4] Bulkeley, K. (2014). Digital dream analysis: A revised method. Consciousness and Cognition, 29, 159–170. https://doi.org/10.1016/j.concog.2014.08.015