### **Anne-Duncan Enright – Professional Ballet Instructor Chatbot**

### **Section 1: Executive Summary**

I chose to create a professional ballet instructor persona with a background dancing in major ballet companies in order to give corrections, exercise tips, ballet class simulations, and advice for a ballet career. I was impressed by the prompts generated by ChatGPT and critiqued by both Grok and ChatGPT, giving me a complex system prompt which outlined the role of a tough ballet instructor very well with nice examples of corrections. The chatbot was able to give general corrections and good advice for exercises to do to improve certain steps yet was unable to produce entirely realistic combinations for a class simulation (a ballet class is composed of a set sequence of “combinations” for different steps such as plies, tendus, turns, or adagio). The final rubric score generated by an iterative process in ChatGPT was an 83/100 because it missed giving some clarifying questions to my prompts and missed a cautionary comment for my arabesque question.

### **Section 2: Persona Design Strategy**

I was emulating some intense ballet teachers I had during my fifteen year pre-professional ballet career that would give more attention to the better dancers and less attention to the less engaged dancer which was emulated in the chatbot as it would give more in depth responses the more questions you asked. I gave ChatGPT a simple prompt asking it to help develop a system persona prompt that was multi-layered and specific. A simple role-playing persona would not be able to give real corrections in a refined manner achieved through the iterative prompting process which ensured professionalism, clarifying questions, and command-style guidance.

### **Section 3: Iterative Development Process**

I first entered a simple prompt asking ChatGPT to help me develop a complex system prompt emulating a tough yet helpful ballet instructor with a background dancing at top ballet companies. It returned with an in depth multi-line prompt expanding my prompt including that the instructor had experience dancing principle and soloist roles as I would expect. It also laid out principles that the teacher followed like a strong emphasis on technique and details as well as methods for communication in a style that doesn’t sugar coat things and corrects in a short, exacting manner. I then put the prompt into Grok asking it to critique and improve the prompt. It brought up many points including clarifying the goals of the chatbot and defining its primary functions (including simulating a class and providing general advice about a ballet career besides simple corrections) as well as the ability to adjust the tone for different levels of skill. I then put the new prompt generated by Grok back into ChatGPT asking to once again critique the prompt and to make it more actionable. The Grok-generated prompt was more clear about what the chatbot should do specifically yet ChatGPT noted that the prompt could be more clear with its corrections and could be more structured in its conversation flow.

### **Section 4: Conversation Analysis**

The chatbot itself performed well with corrections, giving general advice that was mostly correct, while not very indepth yet was good for a beginner dancer. For example, when asking advice for falling out of turns, the chatbot mentioned arm placement which is something I would have brought up as well as an experienced dancer, yet the chatbot only said very general and slightly incorrect information. It said to “place your arms correctly” without fully explaining how to place your arms correctly. I can understand this as that information (shoulder, upper arm, forearm, wrist and finger placement for first position) may not be within its training data yet it also said to place the arms in first position or a low second position depending on my preference however it is extremely rare to have your arms in second position during a turn. There is also not much preference allowed in the ballet studio. It gave great exercise suggestions for different aspects of the class such as getting your back leg in arabesque higher which an advanced ballet teacher would suggest. It also performed well in advice about ballet careers in general such as preparing for an audition. My only complaint is that it said to review your repertoire of variations before an audition yet most auditions for ballet consist of just a ballet class. I was impressed it knew differences between different ballet technique styles and had great advice for networking during a summer intensive course. The biggest failure came from simulating a class and choreographing potential combinations; when I asked it to come up with an adagio combination (a slower combination with high leg extensions) it gave me a very simple combination starting in first position while adagio combinations almost always start in fifth position.

### **Section 5: Evaluation Framework**

The rubric metrics were persona fidelity & tone, technical accuracy & safety, diagnostic probing & level adaptation, structure, brevity & actionability, functional coverage & procedural coherence, and consistency & persona governance. Some of these metrics are based off of some changes to the prompt that occurred through the iterative process such as level adaptation and brevity & actionability. Using this rubric, my ten turns with the chatbot achieved a 83 out of 100. The points off mostly came from a lack of clarifying questions and not as many safety comments as could have been helpful. The technical accuracy metric was not as strong as a human in the loop would have been to check that the corrections were properly applied to the question.

### **Section 6: Conclusions & Future Work**

Using LLM tools to critique your prompt allows for a complex, layered prompt with examples and the iterative process successfully refines the prompt to create a more in depth persona. The system prompting led to an effective chatbot that gives corrections and advice to developing dancers yet with its current training data is unable to replace a full time ballet instructor. A potential extension of this project would be to create a deep learning model able to take a video of a ballet step and using the chatbot’s knowledge could correct the dancer, getting rid of the need for expensive private lessons. I believe there are similar applications currently being developed for baseball and more stat-heavy sports, yet I believe with extensive training data from real ballet dancers this application would change the dance industry and is possible due to the detailed, set nature of ballet technique.