Appendix A: Transcript of the interview with Mr. xx

Me: Good evening, Mr. xx. I am an IBDP student and, for my internal assessment, I am conducting a project for which I have to solve a real-life problem in the form of a program. As we discussed before, you have agreed to be my client in this endeavor. A while ago, you told me that you have been struggling with optimizing and finding the right parameters for your neural networks. Could you elaborate on that, please?

Mr. xx: Yes, of course. The process of finding the right parameters for a neural network is often a long process of testing and checking the results. I have to modify and use various networks quite frequently now, but I am a busy student and I would prefer not to waste this much time on this.

Me: I can offer to write you a program that would help optimize your networks. However, I would need more information for that. Tell me, what do you use your networks for?

Mr. xx: Well, I am a student of Aerospace Engineering at TU Delft and I take a course in programming neural networks, so I use them mostly for schoolwork and personal projects. The problem with optimization applies mostly to the second case – passion projects – where I often need to sort and group datasets of images into categories. For example, I could need to categorize different types of craters on moons and planets from photos provided by NASA.

Me: So I could maybe begin by providing you with a program for optimizing Convolutional Neural Networks (CNNs)? Because, from what I hear, your most-immediate problems involve sorting datasets of images into groups, and CNNs serve that purpose. I think a program for optimizing every type of neural network would be quite robust.

Mr. xx: Yes, CNNs would definitely suffice for now.

Me: So, first things first, I could make a user input for you to define your desired range of parameters, and then make the program train different models of CNNs. What parameters would you like to input?

Mr. xx: Well, I would definitely need to input different ranges for: the number of dense layers, the number of neurons per layer, and the number of convolutional layers. Maybe even a range of kernel sizes, to pool various sizes of kernels in the convolutions.

Me: Noted. Next, the program would probably have to sort the models in a certain way, so that you could choose the best one for your specific purpose. Is there a specific way you would like me to sort them?

Mr. xx: I usually choose my models by finding the one with the highest final validation accuracy.

Me: Then I could even automate the program to choose the best model for you.

Mr. xx: Yes, that would be perfect. And what about the aspect of graphical representation of performances of the different models? I have to be able to compare them in terms of the training and validation losses and accuracies.

Me: Sure, I can make the program create those graphs for you. I can also make separate graphs for the best model so you can view it separately and in more detail. What's more, I use Tensorboard to enable you to use the graphs online - interactively! You could choose which graphs to view, how to sort them, and in how much detail you want to view them!

Mr. xx: That would be perfect!

Me: Well then, I will add to that user-friendly GUI boxes for all the inputs as well as a function to save all the trained models, so you can use them freely later. I will also let you define a directory where you want to save everything along with the graphs and Tensobroard logs.

Mr. xx: Yes, good idea.

Me: Then I believe that would be everything. Would like like to add anything else now?

Mr. xx: No, I think I will be satisfied with what we discussed for now.

Me: Thank you for the interview, then! I will return to you with further developments on the program.