

Examination Form 2: Independent Report

MPhil in Machine Learning and Machine Intelligence 2022

Candidate's Name	Assessor's Name
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This is for your **independent report** on the project (around 200-400 words). Assessors are reminded that this independent report will be made available to the candidate by the Degree Committee for the Department of Engineering.

Alejandro's project considered the problem of multimodal coreference resolution, that is the task of identifying the entities that a user is referring to in a situated dialog system from both natural language and visual inputs. The starting point for his research was the DSTC10 Challenge sub-track on multimodal coreference resolution. Following replication of the results of the top 2 systems (one based on UNITER and one on BART transformer models) from that challenge, Alejandro did a series of analysis of their individual strengths and weaknesses. This provided inspiration for a number of proposed modifications to the systems. A detailed analysis of the errors made in each case motivated further enhancements and the identification of the types of scenarios where one system is preferred. The final joint systems led to a large improvement in the F1-score performance from 0.74 to 0.80. A small exercise with 3 human annotator shows that this is similar to that achieved by humans. Further gains should be possible based on the detailed error analysis. Alejandro has released the code that he replicated and created for his project under open source allowing other researchers to build upon it. He is planning to submit a journal paper based on his research.

This project was a very thorough piece of work. Alejandro took the initiative at each stage and drove the research forward demonstrating a good understanding of both the deep learning techniques studied and the task of multimodal coreference resolution. His references show the wide range of reading that he undertook.

The dissertation write-up is good. There is a logical structure. Some of the discussion, particularly in the introductory chapters could be a bit clearer. There are a few typographical and grammatical errors (e.g. "GPT-2 was trained simple") but they do not impede reading of the dissertation.

This work clearly merits the award of the MPhil degree.

Please send this form to the Course Administrator (mlmi-mphil-admin@eng.cam.ac.uk) no later than 12:00 noon on Monday 5th September 2022.

Assessor's Signature 	Date 4/9/2022
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