

Self Assessment Report

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1 Questions

Question 1

I have reached : considerably advanced knowledge within the main field of study/the specialisation for the education, including advanced insight into current research and development work

This thesis have been focused on item response theory and machine learning. I have spent a great deal of time understanding item response theory and its current application in machine learning. In the background, chapter 2 I have revised the theoretical background of IRT. Furthermore, in section 2.2. I have exposed current research within the field of the applications of item response theory in machine learning.

Question 2

I have reached : specialised methodological knowledge within the main field of study/the specialisation for the education

The methodologies of IRT are different from the procedures used in machine learning. For instance the IRT is applied to the test data and not the hole training data. In chapter 3, a new methodology with the help of prof. BOB is setup in order to analyse the effect of item response theory in machine learning.

Question 3

I have reached : ability to participate in research and development work and so contribute to the formation of knowledge

The data used in this project are GTZAN dataset which is a widely used dataset in music information retrieval. The GTZAN data is not yet analyzed through the IRT framework. Therefore this project helps to give new insights into the application of IRT in ML and music analysis in such way new knowledge can be searched. This is explained in section 2.2 and in chapter 3. Furthermore, it gives some insight for better evaluating machine learning models and test data by introducing the IRT in machine learning.

Question 4

I have demonstrated the : ability to, with a holistic approach, critically, independently and creatively identify, formulate, analyse, assess and deal with complex phenomena and issues, even with limited information

Item response theory is widely used in psychometric and its application in machine learning is not widely understood and used. Therefore, IRT's application in ML is quite a new field of study and a few papers have been written on this topic. The fact that IRT's application in ML is relatively new, there is therefore limited information about IRT's applications. I have therefore with the guidelines of the supervisor setup a new approach for analyzing music data in IRT as described in chapter 3. Moreover, the different issues of IRT's applications are discussed in chapter 5.

Question 5

I have demonstrated the : ability to plan and use appropriate methods to undertake advanced tasks within predetermined parameters, as well as to evaluate this work

By planning about the methods and study previous work in the field. As described in section 3, the methodologies are discussed. The methods are both from machine learning and item response theory. The results are evaluated and discussed in section 5.

Question 6

I have demonstrated the : ability to create, analyse and critically evaluate different technical/architectural solutions

Different state-of-art methods are discussed in section 2. Different application of IRT are discussed. Moreover, different architectures are also discussed and evaluated by their pros and cons. Furthermore, the methodologies as described in section 3 the different systems such as filtered and stratified data are discussed and compared. The analysis is performed under the light of IRT and well-studied statistical methods are used for checking different assumptions.

Question 7

I have demonstrated the : ability to critically and systematically integrate knowledge and ability to identify the need of additional knowledge

Experiences from previous and related works are integrated and used in the methods as described in section 3. Moreover, the previous work are analysed and criticized in section 2. This is particularly clear because IRT and machine learning are combined using the knowledge learned from different papers and previous work.

As any human work, the thesis are not flawless or exhaustive, therefore the need of new experiments and knowledge are needed. Further works and new research directions are discussed in chapter 6, in the conclusions.

Question 8

I have demonstrated the : ability to orally and in writing be able to clearly present and discuss their conclusions, as well as the knowledge and arguments on which they are based

By participating weekly in video meeting with my supervisor and discussing the results, the methods and different technical approaches. Moreover, I have present the main points of my study during the thesis presentation and I have taken the feedback of the opponent, the examiner and the supervisor and revised my work accordingly.

The results are presented in section 4 and they are discussed and evaluated in section 5 and different conclusions are drawn in section 6.

Question 9

I have demonstrated the : ability to within the frames of the degree project identify the role of the scholarship and the engineer in the society

Coming up with new solutions to old or present problems by using and combining existing knowledge as discussed in the introduction and in chapter 2 and 3.

Question 10

I have demonstrated the : ability to within the frame of the specific degree project be able to identify which issues that need to be answered in order to observe relevant dimensions of sustainable development

Sustainable development is an important issue. However, my study is more theoretical and evaluative. No products or heavy computations are made. It should; however, be noted that the computation aspects of software engineering may influence the environment from a sustainable development point of view. The sustainability aspects are discussed in chapter 1, introduction.

Question 11

I have demonstrated the : ability to within the frames of the degree project assess and show awareness of ethical aspects of research and development work, with respect to methods, working methods and results of the degree project

Some ethical aspects are also discussed in chapter 1 in the introduction.

References