CS551H Natural Language Generation

Assessment 2: Technology Assessment Report

Introduction

Global research and advisory firms such as McKinsey and Gartner regularly produce technology assessment reports that present an objective assessment of novel technologies such as NLG. These reports present the range of technology options available, their vendors and their merits and demerits both at a broad level as well as when applied to emerging applications for the novel technology. Gartner introduced popular ideas such as the hype cycle and the magic quadrant to effectively present their research data in these reports. Businesses use these reports to understand the supply side of a novel technology which they then use to match with the in-house understanding they have of the demand side.

These technology reports created by research firms such as Gartner are normally paid for. Although these reports provide the big picture of a technology landscape, the depth of scientific and technological ideas described in these reports could at times be shallow.

With the recent growth in commercial demand for NLG, both buyers and sellers of NLG solutions are looking for expertise to create assessment reports of NLG technology focused mainly on a specific application or a specific business vertical of interest. Your task in this assignment is to write a technology assessment report that exhibits a greater depth of subject knowledge than found in the reports produced by organizations such as Gartner. Your report should describe scientific and technological ideas authentically without using jargon. These ideas should be used to then argue your case for how well a technology fulfills the requirements of an application. The main purpose of your report is to inform decision makers adequately to make a definite influence on their thought process and thereby on their decision making.

In addition to the lecture notes of this course, you are recommended to refer to O Biran and McKeown 2014, Forrest et al 2018 and Reiter 2019 as background reading for this assignment which contain examples of explanatory text. You are welcome to use any other relevant online resources.

XAI as an emerging application area for NLG

As more and more deep learning models are operationally deployed across a broad range of applications such as driverless cars and diabetic retinopathy screening, XAI emerged as the latest technology to provide transparency into the inner-workings of deep learning models. While NLG appears to be suitable in the context of XAI to autogenerate linguistic explanations, several questions need to be answered. What is likely to be the development, deployment and maintenance costs of NLG? What are the quality limitations? How configurable is the technology? Does NLG integrate well with XAI? Your report should answer these questions.

NLG Technology Assessment Report

Over the years, NLG technology underwent a paradigm shift from rule based to statistical and more recently to neural models (Gatt and Krahmer 2018). In your report you will present a technologically sound argument for how the old technologies (rule based) or the new technologies (statistical/ML/DL) or a mixture of both will address the following issues in building NLG solutions to the XAI application context:

1. Lowering development costs – is using new technologies likely to lower the development costs? Why? State clearly what you include as part of development costs.
2. Maintaining high output-text quality – requirements for output-text quality might vary from one application context to the other. For the above XAI application context, what are the constraints on text quality and how the different technologies perform within those constraints?
3. Offering user-configurable (control) NLG solution – users may want to read the same content in multiple languages (e.g. Gaelic), they may want to read shorter or longer text. How do the new and old technologies address these configuration or control issues?
4. Integrating into adjacent technologies such as such as interpretable machine learning (IML), user experience/interfaces (UX/UI) – what are the integration challenges and how each of the new and old technologies address these challenges.

Your report will have six sections: one for addressing each of the above four issues + introduction + conclusion. Overall your report should have at least 1500 words in 11pt Calibri font and not more than five pages (including figures and references).

Marking Scheme

The assignment will be marked for 25 marks and will account for 25% of the coursework. Five marks for the introduction + conclusion sections where higher marks will be given for a balanced assessment of the technology for the given XAI application context. Five marks each for each of the sections addressing the above four issues.

END OF DOC