

Title	A Study on Transformer-based Machine Comprehension with Curriculum Learning
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Citation	
Issue Date	2020-09
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/16864
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A Study on Transformer-based Machine Comprehension with Curriculum Learning

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In the early 1990s, the whole society had no idea about what is the Internet was or what it could do. Just several years later, it had exploded onto computers all over the world. It was a new evolutionary step for society. This also led to the explosion of information. Day by day, increasing amounts of data, humans have to process huge amounts of information every day. To save time and effort, support system such as information extraction and response system that can help humans select information from a large number of documents is essential. Since the 1960s, scientists have been interested in building question answering (QA) system for assisting people in finding information as well as questions that need to be answered. Typically, two early QA systems during this time period were BASEBALL and LUNAR. Both QA systems were very successful in their own domain. LUNAR has proved the usability of the QA system by answering exactly 90% of the questions in its domain posed by people did not have any experiment on the system. Therefore, people do not need to read and understand too many sources of information to come to a conclusion. They can rely on QA system to get answers.

QA system is divided into two types: open and close domain system. Open-domain is the system that can answer questions on many different topics in society. However, the amount of data for this system must be huge and varied on many topics. Not only that, but the growth of social networks has also increased a large number of fake data. This makes finding and processing information more challenging than ever. The close domain is a system used to respond to specific topics, so building data is quite natural because we can quickly check the accuracy of the data.

Thanks to the stable development of hardware, the recent success of deep learning (DL) is unbelievable. From categorizing objects in images and speech recognition to captioning images, understanding visual scenes, summarizing videos, translate language, paint, even produce pictures, speech, sounds, music and also in QA task. This is evidenced by the results of recent state-of-the-art deep learning architecture on open domain datasets beyond human performance.

In this study, We focus on two main things: developing a QA system for improving the health of the society by answering questions regarding nutrition and exercise, testing and slightly improving the performance of current state-of-the-art deep learning architectures on complex structure dataset

by curriculum learning. The results show that although these architectures can surpass human performance in easily structured datasets, they perform poorly performance in complex structured datasets.

Keywords: Deep Learning, Question Answering, Performance, Hardware, Health, Nutrition, Exercise.