



A DEEP LEARNING-BASED SERVICE BOT

Context

Pre-trained language models have developed quickly since Google BERT. The state-of-the-art (transformer-based) models are vast (e.g. GPT-3). More parameters often perform better, but are also harder and more computationally expensive to train.

There is also recent literature that describes how to “inject” knowledge into transformer-based neural networks. This is typically done starting from knowledge graphs. This sounds like a generic approach, but it also requires a step to convert the knowledge into a knowledge graph first.

In this assignment, we want to put these building blocks together and demonstrate that we can ask questions about a machine and get answers back that make use of the injected knowledge. From here we can further extend our requirements.

Internship overview

- Master Student
- Internship and/or Graduation Assignment
- Mathware
- Location: Eindhoven

Technologies

- Deep Learning
- Natural Language Processing and Conversational AI
- Knowledge Graphs



Assignment

At Sioux we are working on a service bot. A complex machine X is producing data (telemetry streams) and log files. There is a lot of information in there that is useful for service engineers, in particular when errors occur that need to be understood and fixed.

We aim to develop a bot that assists the engineers in that process. Existing chatbots are already good at understanding language. The challenge in this assignment is to equip this chatbot with factual knowledge coming from machine X documentation, such that the knowledge can be used to interpret data and log files of machine X. The result we aim for is a service bot that a service engineer can communicate with about the actual machine X.

We want to investigate the combined usage of deep learning techniques, knowledge graphs and pre-trained (deep learning) language models to achieve this goal.

Activities

- Based on recent literature, define most suitable approaches for a framework for our use case.
- Develop approach to embed factual machine knowledge (domain model, documentation, data) into the framework, e.g. through the use of knowledge graphs.
- Develop component that allows for question answering (and ultimately a conversation) by using pre-trained language models, where the answers are based on the embedded machine knowledge.



Why choose Sioux?

- Working on innovative technology
- Challenging, dynamic and varied work
- A comfortable and personal work environment
- Plenty of opportunities for personal development
- Great career opportunities
- Contributing to a safe, healthy and sustainable society

Get in touch!

Would you like to know more about this student assignment?

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