



Googling for the search term "Nuclear Energy" on the [internet](#) yields approximately 268 million hits: Explanations, definitions, lobbying texts, newspaper articles, anecdotes, conspiracy theories. How can someone, for example an investor, seeking real pro and con arguments regarding [nuclear power](#) as a decision-making aid, find what they are looking for? The project "ArgumenText" in the field of Fachgebiet Ubiquitous Knowledge Processing (UKP) of the Department of Computer Science of TU Darmstadt is aimed at filtering out concrete arguments from voluminous and heterogeneous masses of [text](#).

Recently, a demo of the [search system](#) came on the scene which has already proven its worth at trade fairs. For example, anyone who researches the subject of "Nuclear Energy" will, after a few seconds, see just under a hundred arguments for and against nuclear power – from a variety of Internet sites. The better CO<sub>2</sub> balance and the efficiency of atomic energy generation are listed here, along with the toxicity and hazardous nature of the substances used and the long periods during which they exude radioactive waste into their surroundings. The respective sources are linked.

For this purpose, texts available on the internet are examined by means of neural networks, classified as relevant or not relevant to the search topic, and then tapped for arguments. "Not only are individual words searched, but grammatical structures, con-texts and semantics are examined to decide if a statement is an 'argument' or not and whether it is on the pro or con side," explains Dr. Johannes Daxenberger, who works in the team of Professor Iryna Gurevych as one of the two project managers at ArgumenText.

The algorithms behind ArgumenText are under development by the team in the field itself, building on initial experiments that started in 2014 with a body of student essays. "The challenge was to make a system trained on a specific type of text transferable to any kind of text," says

second project manager Dr. Christian Stab." Argumentation in scientific texts, for example, is completely different than in social media." The team operationalized various models of argumentation theory and taught computer systems to use these models. To optimize the algorithms, the team employed a powerful computer network; a smaller, more powerful computer network that can efficiently index internet-based texts is now used for ongoing operation.

## **Public demonstrator**

The demonstrator is stable and has recently become publicly available. The project is thus entering the next phase, which will specifically test which applications are particularly promising for the new technology. The main target groups are decision-makers from the business world who must assess whether the use of an innovation is worthwhile, and journalists who must quickly and dependably make their way to the core of a subject in the framework of a search, says Daxenberger. "We think that the system could be used profitably in these areas."

For validation purposes, the participating scientists are currently preparing the method for use with German-language texts as well. Now, ArgumenText speaks only English, works with a text corpus from the year 2016 and works best with technical queries. This will soon change. It will also be possible to search in real time in the ever-growing number of texts on the internet.

Currently, the algorithm sorts statements by how reliably they can serve as arguments. Scientists are working for aggregation of the arguments toward users, presenting them according to themes. "This is obvious from an application perspective, but certainly not trivial from a technical point of view," says Stab. Argument mining, the recognition of linguistic arguments by means of computer science, is becoming ever more important and visible, say Daxenberger and Stab, in the research of

Digital Humanities. The TU was active in this area early on. "Our working group has well and visibly established the TU in the field of argument mining," says Professor Iryna Gurevych, head of the UKP. For this purpose, the interdisciplinary team works with the TU Department of Social and Historical Sciences, as well as with other universities from the network of Rhine-Main universities.

**More information:** ArgumenText: Searching for Arguments in Heterogeneous Sources. Proceedings of NAACL-HLT 2018: Demonstrations. [www.aclweb.org/anthology/N18-5005](http://www.aclweb.org/anthology/N18-5005)

Provided by Technische Universität Darmstadt

Citation: Searching through noise for pros and cons (2018, September 14) retrieved 30 April 2024 from <https://phys.org/news/2018-09-noise-pros-cons.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.