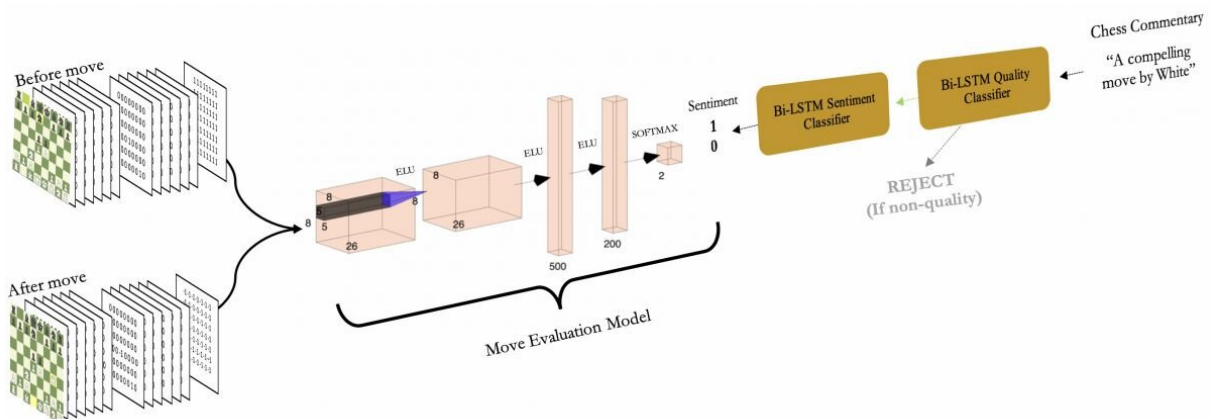


# Researchers explore natural language processing to assess chess moves

August 6 2019, by Nancy Cohen



Complete pipeline for training the evaluation model. Credit: arXiv:1907.08321 [cs.LG]

Chess and AI are in the news again, this time in reports about a team who explore a model for chess via natural language processing (NLP). The learning mechanism was chess chatter—well chosen chatter. They pretrained on commentary sentiments that were associated with chess moves. The sentiments guided the agent's decision making.

Their resulting [chess](#) algorithm was designed to evaluate the quality of chess moves by analyzing the reaction of expert commentators.

The three researchers from University College London wrote a paper describing their methods and results. Isaac Kamlish, Isaac Chocron and Nicholas McCarthy wrote "SentiMATE: Learning to play Chess through Natural Language Processing," and it is up on arXiv. The paper was submitted last month.

"We present SentiMATE, a novel end-to-end Deep Learning model for Chess, employing Natural Language Processing that aims to learn an effective evaluation function assessing move quality. This function is pre-trained on the sentiment of commentary associated with the training moves, and is used to guide and optimize the agent's game-playing decision making."

Don't invite AlphaZero and this NLP model to the same party; they would stay in opposite sides of the room. The researchers wrote that Deep Mind's AlphaZero had succeeded "after millions of iterations of self-play and using thousands of Tensor Processing Units (TPUs)." That was not the case in the new research.

Instead, they said, they aimed "to tackle the assessment of the quality of individual movements through the use of Natural Language Processing...Data from different Chess websites was scraped, which included information regarding the moves being made, and a qualitative assessment of the moves themselves in the form of commentary, written by a wide range of Chess players; resulting in a large database of moves with annotated commentary."

"It evaluates the quality of chess moves by analyzing the reaction of expert commentators," said Will Knight, *MIT Technology Review*.

The researchers pruned out commentary that did not relate to high-quality moves and examples that were too ambiguous, he added. "Then they used a special type of recurrent neural network and word

embeddings (a mathematical technique that connects words on the basis of their meanings), trained on another state-of-the-art model for analyzing language."

The algorithm, called SentiMATE, worked out by itself the basic rules of chess as well as several key strategies—including forking and castling.

The team found that SentiMATE was capable of evaluating chess moves "based on a pre-trained sentiment evaluation function." They concluded that there was strong evidence to support [natural language](#) processing being used for training an evaluation function in chess engines.

The performance of their solution was less than spectacular. Knight said, "it failed to beat some conventional chess bots consistently." That, however, should not distract from the fact that SentiMATE worked, and the manner in which it worked:

"SentiMATE surprised the researchers with its ability to work out some of the basic tenets of chess as well as several key strategies, such as forking (when two or more pieces are simultaneously threatened) and castling (when the king and castle both move to a more defensive position on the back of the board," the authors said.

The important takeaway is in efforts to design such a program: can language serve to teach how to play chess with less practice data required than in conventional approaches?

Tibi Puiu in *ZME Science* thought about that:

"Only this [time](#), their machine learning program didn't practice millions of games to master chess but rather analyzed the language of expert commentators. Someday, the researchers say that a similar approach could allow machines to decipher emotional language and acquire skills

which would have otherwise been inaccessible through 'brute force'."

As for the model not being a super chess champ, he said, "High-level performance was not its objective, though. Where SentiMATE shines is in its ability to use [language](#) to acquire a skill instead of practicing it."

In their paper, the authors talked about the all-important dataset to support their research. "Upon cleaning and classifying the dataset based on commentary, bitifying the Chess moves, and applying Sentiment Analysis to the commentary, we present SentiChess a dataset of 15,000 Chess moves represented in bit format, alongside their commentary and sentiment evaluation. This dataset is offered in the hope of further development of work around sentiment-based Chess models, and statistical move analysis."

Moving forward, Will Knight said game-relevant chatter could help AI programs learn to play the game in a new way. And, beyond chess, "the same technique could allow machines to use the emotional content of our [language](#) to master various practical tasks."

(As the *MIT Technology Review*'s subhead put it, "Machines that appreciate 'brilliant' and 'dumb' chess moves could learn to play the game—and do other things—more efficiently.")

**More information:** SentiMATE: Learning to play Chess through Natural Language Processing, arXiv:1907.08321 [cs.LG]  
[arxiv.org/abs/1907.08321](https://arxiv.org/abs/1907.08321)

© 2019 Science X Network

Citation: Researchers explore natural language processing to assess chess moves (2019, August 6) retrieved 26 April 2024 from

<https://techxplore.com/news/2019-08-explore-natural-language-chess.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.