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ACL Paper Summary

For our ACL paper summary we chose the paper "Legal Judgment Prediction via Event Extraction with Constraints" by Yi Feng , Chuanyi Li , and Vincent Ng. Yi Feng and Chuanyi Li are both affiliated with the State Key Laboratory for Novel Software Technology, Nanjing University, China.

Legal Judgment Prediction (LJP) is a model for predicting the outcome of a legal court case. The idea of LJP is to "given the facts of a legal case be able to predict the court's outcome" [1]. Currently even the best models fail to predict the key event information, as sometimes statements contain a lot of information about details in the case which can make the LJP model think the case is about something else than it actually is. The paper gives an example of this from a "statement of a robbery case involves the illegal break-in description. Existing models wrongly predict that the law article is about illegal search since many words describe the break-in process even though the main point is about robbery" [1]. By missing the key information this also makes the model predict the wrong outcome of the case. To solve this problem the authors recommend a new approach, looking at two key parts of a law article "(1) the event pattern, which stipulates the behavior that violates the law, and (2) the judgment, which describes the corresponding penalties" [1]. The two key parts can be viewed as a pair, "if an event pattern is detected, the corresponding judgment can be inferred from the causal pair" [1]. To put simply the judgment for the case is based on the key event information. So if the key event information is extracted from the facts, related law articles to the case could be retrieved to infer the judgment for the case.

In the next part of the paper the authors discuss work that has already been done in this area. LJP has been investigated in multiple places such as China, U.S., Europe, and India. Early approaches used rule-based approaches, later on classification techniques were used, and now more recently neural models have been used. The authors explain the difference is that these prior approaches do not explore the use of case events for LJP. Also, the authors' approach guarantees that the predictions are consistent.

As per the abstract of the paper, the goal of the author's contributions is to make progress on the various failures of the SOTA Legal Judgment Prediction models. This being to "locate the key event information that determines judgment," and to "exploit the cross-task consistency constraints that exist among the subtasks of LJP" [1]. The unique proposal that was made was to create an Event-based Prediction Model, coded with constraints that "surpass existing SOTA models in performance on a standard LJP dataset (CAIL)," which is trained using the pre-training and fine-tuning strategies [1]. However, it's pre-trained without event components on the training portion of the CAIL dataset, and fine-tuned on the training data of the LJP-E, the event-annotated dataset that is based on the CAIL dataset.

The EPM achieves SOTA results, while improving upon the LJP through event extraction and hand-picked constraints. It makes progress towards correcting the aforementioned failures of the SOTA model.

After building the EPM, it is compared to the SOTA models on the test data in the LJP-E dataset. We see the best results coming from the EPM, outperforming each of the four SOTA deep neural network models. To further test the usefulness of the EPM, experiments are conducted on it via ablation of its constraints. Afterwards, a qualitative analysis is performed on the model to understand the role of the event information and constraints of EPM. These

analyses are used as a tangible metric for evaluating the performance of their EPM model, which was created in such a way to address issues of the SOTA.

Moreover, one of the prominent authors of this paper is Dr. Vincent Ng, who is coincidentally a Professor of Computer Science here at the University of Texas at Dallas. He has over 9272 citations, 4485 of which being since 2018 as of the current date. Dr. Ng specializes in machine learning and artificial intelligence, and is prominent in the school of engineering and computer science at our school. Hence why he is the most notable author for this paper. With that being said, we believe that the work done and outlined in this paper is important as it was able to make notable improvements to the original SOTA model created for the Legal Judgment Prediction problem. The EPM model, which was created to improve upon the SOTA, was able to maintain the results that SOTA had achieved, while improving upon its failures. This should in turn provide a foundation for more progress to be made on improving results for the LJP problem, now that the model better fits the problem.

Works Cited

[1] Y. Feng, C. Li, and V. Ng, “Legal Judgment Prediction via Event Extraction with Constraint,” *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics*, vol. 1, May, 2022. [Online serial]. Available: https://aclanthology.org/2022.acl-long.48/. [Accessed March 23, 2023].

[2] V. Ng, “Vincent Ng- Google Scholar,” 2023. [Online]. Available: https://scholar.google.com/citations?user=4UyniXYAAAAJ&hl=en&oi=ao. [Accessed March 23, 2023].