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Nils Holzenberger is a fifth-year PhD student at Johns Hopkins University, advised by Prof. Benjamin Van Durme. Affiliated with the Center for Language and Speech Processing, his research interests center on NLP for the legal domain, and currently focus on models able to reason with prescriptive rules specified in natural language.

Statutory Reasoning: Applying NLP to Tax Law

NLP research has produced increasingly powerful models for language understanding, which hold the promise of automating the processing of large corpora and yielding new insights by connecting seemingly unrelated documents. This ability is particularly relevant for tax law: some companies manage to pay less taxes than expected, by leveraging interactions between tax regulations unforeseen by the lawmaker. For an NLP system to discover these loopholes automatically, we need models able to reason with legal rules. I will describe the task of statutory reasoning, which asks whether a given tax law statute applies to a given case.

In support of this work, we designed and constructed the SARA dataset as a test bed for a computational model's understanding of tax law. We then found that statutory reasoning is a serious challenge for off-the-shelf, language-model-based machine reading models. Recently, we have decomposed statutory reasoning as a set of language understanding problems, which connect to existing NLP tasks, and obtained improvements over prior baselines. Our decomposition into subtasks facilitates finer-grained model diagnostics and clearer incremental progress. Beyond the legal domain, progress on statutory reasoning has the potential to inform the design of NLP models able to utilize prescriptive rules stated in natural language. This line of research was done in collaboration with Andrew Blair-Stanek.

Friday, September 17, 2021

1:25 - 2:45 PM EDT

Room A35 Posner Hall

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