

“Rules as Code”: Goal-Directed Answer Set Programming for Legal Reasoning

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Abstract

Below

Keywords

Rules as Code, s(CASP), Legal Technology, Explainable AI

1. Rules as Code

Rules as Code¹ is a proposed methodology for legislative drafting and public service delivery that proposes that rules be drafted in natural and executable languages at the same time. The alleged benefits of this approach include improvements to legislative drafting quality, and ease in developing legally compliant automated services.

2. Experiments using s(CASP)

While at Singapore Management University Centre for Computational Law, the author used a goal-directed answer set programming tool, s(CASP), to encode Rule 34 of Singapore’s Legal Profession (Professional Conduct) Rules 2015² to perform two experiments aimed at demonstrating these benefits of Rules as Code, and testing the relative strength of tools such as s(CASP) for those tasks.

In the first experiment³, two encodings were created in s(CASP): a literal interpretation of Rule 34 itself, and tests representing the Rule’s anticipated purposive intent. Test failures that could not be explained by coding or interpretive errors were used to detect and test amendments to correct possible drafting problems.

In the second experiment⁴, a new data format called the Legal Expert System Interface Schema (LExSIS) was used to allow the user to provide application-specific information not included in


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¹Mohun, J. and A. Roberts (2020), “Cracking the code: Rulemaking for humans and machines”, OECD Working Papers on Public Governance, No. 42, OECD Publishing, Paris, <https://doi.org/10.1787/3afe6ba5-en>.

²Available at: <https://sso.agc.gov.sg/SL/LPA1966-S706-2015#pr34->

³Available at: https://github.com/smucclaw/r34_sCASP

⁴Available at: <https://github.com/smucclaw/docassemble-l4>

the s(CASP) encoding of the amended Rule 34. The LExSIS file and s(CASP) encoding were then used to automatically generate a user-facing application built on the Docassemble⁵ platform.

3. Results

The first experiment revealed a drafting problem in Rule 34(1)(b), which was corrected in a proposed amendment, which was then tested successfully. The second experiment demonstrated the world's first open source legal expert system tool powered on declarative encodings of legislation, and capable of providing a natural language explanation for its conclusions.

These experiments provide evidence for both category of benefits of Rules as Code. They also demonstrated the importance of natural language justifications for both purposes, and in particular the utility of s(CASP) in giving the legal knowledge engineer deeper insight to how their encoding or their legislation behaves in a variety of fact scenarios, without the need to generate test cases.

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⁵Available at: <https://docassemble.org>