

Computational Law in a Nutshell

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Abstract: Technology has demonstrated the potential to revolutionize legal-services delivery, thus improving access to law and legal services for everyone. Computational technologies hold great promise for automating the delivery of various legal services across this spectrum. As technologies advance, savvy lawyers will use them to augment their services. Computational law is a growing interdisciplinary field that stands at the intersection of law and computation. It uses computer science and engineering to create automated legal software that can be used on a computer or in a mobile application.

This paper addresses the topic of computational law and its implications for law and privacy.

Key points: law, computation, computational law.

INTRODUCTION

Computers are playing an increasingly important role in engineering and technology. Since the beginning of the computer era, engineers and scientists have been at the forefront of computational science. They have used computers to solve practical problems. They employ several techniques which can be classified as experimental, analytical, or numerical [1]. These three are related as shown in Figure 1.

Numerical modeling or computation and simulation have revolutionized all aspects of engineering design to the extent that several software packages have been developed. In the 1970s, researchers developed their own computer programs to solve problems since very few commercial solvers existed. Nowadays, the situation is completely different. There are dozens of computational tools in the market. There is no longer motivation or a justifiable need to develop one's own software tools at universities and in industry. There is growing interest and dependence on commercial software in designing complex problems both in industry and academia. These commercial codes have been attractive due to their ease of use of graphic interface and the ability to model the real structure in its detail [2].

COMPUTATIONAL LAW

Computational law (CompLaw) is the branch of law concerned with the automation of legal reasoning. It is an approach to automated legal reasoning focusing on semantically rich laws, regulations, contract terms, and business rules in the context of electronically-mediated actions. Research in this field has shown benefits for businesses in automating the legal relationships and streamlining the legal interactions between parties. Computational law systems differ from other

legal system due to their autonomy, i.e. the ability to answer legal questions without additional input from human legal experts. Consequences of computational legal systems failing are greater than if they were merely software and hardware.

The idea of computational law is not new. It dates back at least to the 1970s. Since then, scholars have developed the theory and technology necessary to build autonomous physical systems such as self-driving cars and robots. Throughout history, from the Code of Hammurabi up until today, the purpose of law has been to serve people and reduce conflicts. It is important to never lose sight of this core purpose as we apply law to emerging technologies. The success of computational law will rely on people of different backgrounds and purposes coming together to design novel, modern, and improved legal systems, as shown in Figure 2 [3].

APPLICATIONS

There are many possible applications of computational law. One interesting area is compliance management, i.e. the development and deployment of computer systems capable of assessing, facilitating, or enforcing compliance with rules and regulations. Computational law systems are currently most common in fields such as tax law and compliance checking. Many current efforts in computational law are focused on the empirical analysis of legal decisions, and their relation to legislation. Visualization of legal code, and of the relationships between various laws and decisions, is also a hot topic in computational law [4]. Automated decision-making and systems which assist users are now used in various jurisdictions, but with this maturity come certain caveats. Privacy-enhancing technologies (PET) systems are meant to protect individual personal data and ensure that their information processing is transparent, confidential, and user centered. PET solutions generally address issues such as anonymization, obfuscation, identification, accessibility, consent-management, compliance checking, and data sharing

BENEFITS

Proponents of computational law argue that law that “works like software” will create a more just society by reducing human error and bias and by granting those without law degrees access to accurate and affordable legal analysis. Computational law has the potential to bring about dramatic changes to our legal system. It can improve the services provided by lawyers. It can help lawmakers and regulators craft better rules and regulations. Although there are many areas where computational law systems can do better than humans, computational law will not eliminate the need for human legal professionals in the foreseeable future [5].

CHALLENGES

Privacy and security are often perceived as two faces of the same coin in the US. The existing methods for dealing with privacy and data protection are not equal to modern challenges. The concept of Privacy Self-Management in the US and the European General Data Protection Regulation (GDPR) have proven to be inadequate for the demands presented by technologies that people use daily. Little should be expected from a privacy professional who does not use computational tools to address computational issues related to Privacy. The US approach to privacy pursues the goal of regulating the processing of data in specific domains of economic activity. So, the US legal framework perceives privacy as an economic and consumer-centered concept. Privacy rights belong to the spectrum of publicity rights in the US. Therefore, these rights are subject to the property law paradigm of ownership, and commercialization. Information that is publicly available on sites like Facebook, Twitter, and YouTube cannot qualify as private information because it has voluntarily been given to third parties. The US currently lacks a federal regulation on data protection [6].

Lawyers do not think of law as being dependent on a specific technology. They seem to assume that law is a thing irrespective of any technological underpinnings. While digital technologies afford automation by way of digital computers, computational technologies afford a more radical transformation of the constitution of reality. Computational systems may serve as aids for a more efficient, effective, fair, and just law [7].

CONCLUSION

Computational law is the branch of legal informatics concerned with the codification of regulations in precise, computable form, and the automation of legal reasoning. It has been promoted as a means to empower individuals and improve access to justice and legal outcomes. The promise of computational law represents an interesting opportunity to enhance privacy solutions. Computational law will play a crucial role in the adoption of new and connected technologies. If we are to realize the potential to improve society with computational technologies, law, regulation, and ethical principles must be front and center at every stage. To achieve this, technologists and lawyers must collaborate [8]. More information about computational law can be found in the books in [9-13] and the following related journal: *Journal of Cross-disciplinary Research in Computational Law*.

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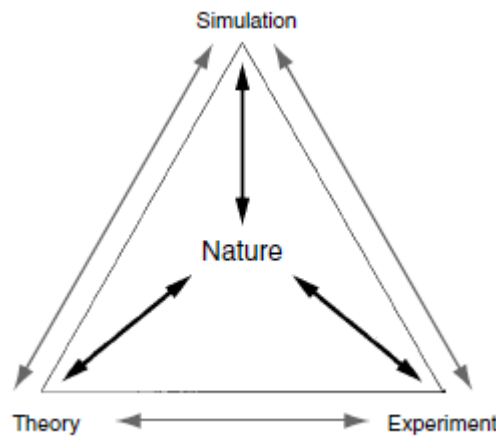


Figure 1 The relationship between experiment, theory, and simulation [1].



Figure 2 Computational law requires collaboration [3].