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Argumentation Frameworks and Theories of Judging

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Abstract : With the rise of artificial intelligence, computer science is becoming increasingly integrated in virtually every area of life. Of course, the law is no exception. Through argumentation frameworks (AFs), computer scientists have used abstract algebra to structure the legal reasoning process in a way that allows conclusions to be drawn from a formalized system of arguments. In AFs, arguments compete against each other for logical success and are related to one another through the binary operation of the attack. The prevailing arguments make up the preferred extension of the given argumentation framework, telling us what set of arguments must be accepted from a logical standpoint. There have been several developments of AFs since its original conception in the early 90's in efforts to make them more aligned with the human reasoning process. Generally, these developments have sought to add nuance to the factors that influence the logical success of competing arguments (e.g., giving an argument more logical strength based on the underlying value it promotes). The most cogent development was that of the Extended Argumentation Framework (EAF), in which attacks can themselves be attacked by other arguments, and the promotion of different competing values can be formalized within the system. This article applies the logical structure of EAFs to current theoretical understandings of judicial reasoning to contribute to theories of judging and to the evolution of AFs simultaneously. The argument is that the main limitation of EAFs, when applied to judicial reasoning, is that they require judges to themselves assign values to different arguments and then lexically order these values to determine the given framework's preferred extension. Drawing on John Rawls' Theory of Justice, the examination that follows is whether values are lexical and commensurable to this extent. The analysis that follows then suggests a potential extension of the EAF system with an approach that formalizes different "planes of attack" for competing arguments that promote lexically ordered values. This article concludes with a summary of how these insights contribute to theories of judging and of legal reasoning more broadly, specifically in indeterminate cases where judges must turn to value-based approaches.

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