Computational Argumentation – Formal Models and Complexity Results[*]

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Abstract Argumentation is a communicative and interactional act aimed at resolving a difference of opinion. The last two decades have seen a formal and computational turn in argumentation theory with the goal to automate different aspects of argumentation. This leads to several challenges from an AI perspective, including efficient algorithms that need to be designed to guarantee short response times of argumentation systems. In this talk, I first give a broad overview on the area of computational argumentation and discuss shortcomings of current approaches. We then identify a particular leak in the popular argumentation-pipeline model, where conflict resolution is solely based on abstract arguments rather than on the arguments' claims. I will introduce a new formal model that shifts the focus from arguments to claims and give a comprehensive complexity analysis of several argumentation semantics under this claim-centric view. In addition, the talk addresses the complexity of sub-classes and presents novel parameterizations which exploit the nature of claims explicitly along with fixed-parameter tractability results.