Preface

Classical reasoning is not flexible enough when directly applied to the formalization of certain nuances of human quotidian decision making. These involve different kinds of reasoning such as reasoning with uncertainty, exceptions, similarity, vagueness, incomplete or contradictory information and many others.

It turns out that everyday reasoning usually shows the two intertwined aspects below:

Ampliative aspect: augmenting the underlying reasoning by allowing more conclusions. In practical contexts, this amounts to the ability to make inferences that venture beyond the scope of the premises, somehow in an unsound but justifiable way. Prominent examples are (*i*) default reasoning: jumping to conclusions deemed as plausible 'by default', i.e., in the absence of information to the contrary, like applying negation as failure or adopting the closed-world assumption, and (*ii*) inductive and abductive reasoning: taking chances in drawing conclusions that implicitly call for further scrutiny or tests by empirical observations, like in making inductive hypothesis in scientific theories or finding abductive explanations in forensics.

Defeasible aspect: curtailing the underlying reasoning by either disregarding or disallowing some conclusions that somehow ought not to be sanctioned. In practice, this amounts to the ability to backtrack one's conclusions or to admit exceptions in reasoning. Some examples of this are (*i*) retractive reasoning: withdrawing conclusions that have already been derived, like in belief contraction or in negotiation, and (*ii*) preemptive reasoning: preventing or blocking the inference of some conclusions by disallowing their derivation in the first place, like in dealing with exceptional cases in multiple inheritance networks and in regulatory systems.

Several efforts have been put into the study and definition of formalisms within which the aforementioned aspects of everyday reasoning could adequately be captured at different levels. Despite the progress that has been achieved, a large avenue remains open for exploration. Indeed, the literature on nonmonotonic reasoning has focused almost exclusively on defeasibility of argument forms; belief revision paradigms are restricted to an underlying classical (Tarskian) consequence relation, and even if some of the issues related to uncertainty in reasoning have been studied using probabilistic approaches and statistical methods, their integration with qualitative frameworks remain a challenge. Moreover, well-established approaches are largely based on propositional languages or haunted by the undecidability of full first-order logic. Modern applications require formalisms with a good balance between expressive power and computational complexity.

The third edition of DARe aims at bringing together researchers and practitioners from core areas of artificial intelligence, cognitive sciences, philosophy and related disciplines to discuss the defeasible and ampliative aspects of reasoning in a multi-disciplinary forum. The goal of the workshop is to present latest research developments, to discuss current directions in the field, and to collect first-hand feedback from the community.

Each submission to DARe 2016 was peer-reviewed by three members of the Program Committee. The accepted papers, bound in these Workshop Notes were carefully selected based on their quality, relevance to the workshop topic, and their potential to bring forward interesting ideas to be discussed at the workshop.

Thanks to the invaluable and much appreciated contributions of the authors and the Programme Committee, DARe 2016 provides participants with an opportunity to position their contributions with respect to one another. Hopefully, this will encourage further cross-pollination and set out the constitution of a truly interdisciplinary research-community around the different aspects and approaches to defeasible and ampliative reasoning.

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