UCLA Philosophy

Defeasible Inference in Philosophy and Artificial Intelligence

Federico L. G. Faroldi (University of Ghent, University of Salzburg)
Title: "Deontic Modality, Generically"
Abstract: I aim to explore a generic understanding of deontic modalities. I suggest, for instance, that a sentence such as `Everyone ought to pay taxes' is true just in case the generic (deontically relevant) individual pays taxes. Different degrees of genericity are explored, without assuming too much about a specific theory of genericity. I argue that such an analysis captures our intuitions about exceptions and the general character of deontic claims better than classical approaches based on possible-world semantics and than defeasibility-based approaches, while remaining within a broadly deductive framework

Luc De Raedt (Katholieke Universiteit Leuven)
Title: "Logic, Probability and Learning: An AI Perspective"
Abstract: An introduction will be given to probabilistic logic programming, an area within artificial intelligence that aims at integrating logic, probability and learning within a (logic) programming language. Three topics will be covered: 1) inductive learning of logic programs from examples, i.e., logic and learning as studied in inductive logic programming and relational learning; 2) semantics, inference and learning of probabilistic logic programming languages such as ProbLog; and 3) recent extensions of such languages for use in neuro-symbolic computation.

Ulf Hlobil (Concordia University)
Title: "Reasoning First"
Abstract: I present a view according to which the property of being a good piece of reasoning plays a central explanatory role. On the practical side, e.g., we can explain notions like "reason to act", "permissible", and "acting virtuously" in terms of good practical reasoning. On the theoretical side, the notion of good reasoning allows us to give an account of logical consequence. According to this account, logical consequence is merely a particular subset of a broader class of validities that are usually defeasible and material. This suggests a new approach to nonmonotonic logic that reverses the usual order of explanation. That reversal must, at first, seem unattractive to those who want to use nonmonotonic logics in the creation of AI. I point out some advantages of the approach.

John Horty (University of Maryland)
Title: TBD
Abstract: TBD

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Daniel Kaplan (University of Pittsburgh)
Title: "Defeasible Content"
Abstract: The phenomenon of defeasible or non-monotonic inference seems fairly straightforward: if from p follows q, but from p together with r does not follow q, then we say that the implication from p to q is defeasible. Yet most accounts still insist (at least implicitly) on fairly orthodox understandings of content such that it becomes difficult to see a univocal way of understanding both p and "follows from" that gets the above right. I put forward an account of what I call "defeasible content" that makes natural the idea that both of the above are univocal. I do this by following semantic inferentialists who understand content as (at least partially) constituted by its role in ordinary reasoning. My own account thus takes defeasible reasoning to be an essential part of the content itself and is not explained as somehow downstream from that content. Along the way I explore two other accounts of defeasible reasoning: preferential models and default logic. I argue that these accounts fail to understand defeasible inference as an essential feature of content itself.

Jared Millson (Agnes Scott College)
Title: "A Defeasible Logic for Zetetic Agents"
Abstract: The study of defeasible reasoning unites epistemologists with those working in AI, in part, because both are interested in epistemic rationality. While it is traditionally thought to govern the formation and (with)holding of beliefs, epistemic rationality may also apply to the interrogative attitudes associated with our core epistemic practice of inquiry, such as wondering, investigating, and curiosity. Since generally intelligent systems should be capable of rational informative-seeking behavior, AI researchers have a natural interest in the norms that govern interrogative attitudes, or what I call zetetic rationality. In this paper, I draw on recent work in epistemology and nonclassical logic to argue that zetetic rationality can be modeled via defeasible inferences to and from questions, i.e. erotetic inferences. I offer a sequent calculus that accommodates the unique features of "erotetic defeat" and that exhibits the computational properties needed to inform the design of zetetically rational systems.

Francesca Toni (Imperial College London)
Title: "Non-monotonic Reasoning by Computational Argumentation"
Abstract: Computational argumentation, as understood in AI, has strong roots within non-monotonic reasoning. I will show how a number of approaches to support non-monotonic reasoning, including logic programming and default logic, can be understood argumentatively, in abstract argumentation and assumption-based argumentation (two well know formalisms in computational argumentation), and what this understanding empowers in terms of cross-fertilisation and computation.

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Tianyu Wu (UC Irvine)

Title: "On the Logic Programming Solution to the Imperfective Paradox"

Abstract: In this paper, I provide an accessible explication and an in-depth evaluation of the "logic of planning" designed by Michiel van Lambalgen and Fritz Hamm in their 2008 book *The Proper Treatment of Events* as a tool to model temporal notions in natural languages and to solve long-standing paradoxes in formal semantics. In particular, their use of logic programming makes their method distinctively new in the literature of formal semantics. I argue that, though this system can avoid some known problems facing the famous early solution to the imperfective paradox given by Dowty (1979), it falls short as a fully satisfactory solution to the paradox. I show this by elaborating on the objection from Perrin and Vidal (2017) concerning impossible and infeasible tasks, and through an inexpressibility objection related to their use of three-valued logic. These problems thus limit the scope of their ability to offer fundamentally different solutions to the problems in formal semantics.