Prague Logic Camp / Prague Gathering of Logicians

Thursday, 9 May 2019

Carles Noguera (UTIA CAS): Mathematical Fuzzy Logic and graded reasoning
(10:00–11:00)

Abstract: Graded predicates are pervasive in natural language and are an essential device in human knowledge and reasoning. They include, among others, vague predicates such as "rich", "tall", "old" or "red", which do not yield a precise separation between the objects to which they apply and those to which they do not. Vague predicates give rise to difficult logical challenges such as the sorites paradox. Indeed, take a vague predicate F and a sequence of objects $1, 2, \ldots, n$, such that: $F(1)$ is true, $F(n)$ is false, and for each i, the objects i and $i + 1$ are extremely similar in all respects relevant to the application of F; the sorites paradox is an argument which, based on two apparently true premises $F(1)$ and "for each i: $F(i)$ implies $F(i + 1)$", after n applications of modus ponens reaches the clearly false conclusion $F(n)$.

This paradox has been intensively discussed in the literature and several competing theories of vagueness have emerged. In this talk we will concentrate on accounts given in terms of fuzzy logics. The main idea is that for graded predicates in general, and for vague predicates in particular, truth is not a matter of all or nothing, but a matter of degree. That is, a proposition can be true (in different intensities), can be false (in different intensities too), and (possibly) have intermediate truth degrees. This allows solve the paradox by giving a semantic interpretation in which the second premise is almost true – so for ordinary purposes we accept it – but it is not fully true, and so the argument is correct but unsound.

The goal of this talk is to introduce the theoretical apparatus of Mathematical Fuzzy Logic in the necessary extent to show and discuss, in some detail, its solutions to the sorites paradox and put forward a general research program for graded reasoning.

Amanda Vidal (ICS CAS): Many-valued modal logics   (11:30–12:30)

Abstract: The talk outlines, in a non-technical way, the basic motivations of many-valued modal logics, the differences between them an classical modal logics, and some current research problems in the area of many-valued modal logic.

Andrew Tedder (ICS CAS): Two logics of variable essence   (14:30–15:30)

Abstract: Theories relating the modal properties of objects to essences of those objects are about as old as the study of modal metaphysics itself, and Kit Fine's recent work on the logic of essence provides a semantic and proof theoretic characterisation of one such theory. In this talk, I consider an alternative framework, and develop it in the direction of providing natural logics of variable essences – the idea being to characterise counterfactual (counterpossible) situations/worlds in which objects have essential properties other than they actually do, and so, have different modal properties more generally. Semantics are

presented for two logics of variable essences, one classical and one non-classical, and we consider some questions concerning the proof theoretic characterisation of these systems, as well as discuss the use of the systems for modelling the divine voluntarist view, arguably, developed by Descartes in his discussion of the eternal truths.

Vít Punčochář (FLU CAS): A duality between two semantic frameworks
(16:00–17:00)

Abstract: In my talk I will present a logical system $InqR$, which is a logic of questions based on the relevant logic R as the background logic of declaratives. I will develop a semantics for $InqR$ and it will be shown that this semantics is, in a precisely defined sense, dual to Routley-Meyer semantics for R. I will discuss a philosophical meaning of the duality between Routley-Meyer semantics and the semantics for $InqR$.

Igor Sedlár (ICS CAS): Dynamics in non-classical logic (17:30–18:30)

Abstract: Dynamic logics formalize reasoning about dynamics of information, broadly speaking. Instances of such dynamics include modifications of variable assignments in the course of a run of a computer program, or updates of knowledge bases by new information. Most current research on dynamic logic concerns extensions of classical logic, but there are good reasons to consider alternatives based on non-classical logic. In my talk I outline these reasons and alternatives, thereby providing a gentle introduction to non-classical dynamic logic.