PHIL 478:  
Logics for Defeasible Reasoning  
Syllabus Version #1  
January 27, 2014

Description

Philosophy and artificial intelligence often rely on logical models of reasoning, yet standard logic, originally designed to systematize reasoning in mathematics, applies only in domains where information is certain. In many scientific fields, as well as in ordinary commonsense reasoning, both people and machines must reason on the basis of information that is uncertain, incomplete, or even inconsistent. This course is focused on logics—sometimes known as “defeasible” or “nonmonotonic” logics—designed for reasoning with information of this kind. Course prerequisites: PHIL 370 or equivalent work in formal logic or permission of the instructor.

Time and place

Tuesday and Thursday, 3:30 - 4:45, Skinner Building, Rm. 1115

Contact information

Office: Skinner Building, Room 1101. Office phone: I don’t use my office phone. Cell phone: 301-408-8963 (you are welcome to call my cell). Email: horty@umiacs.umd.edu. Office hours: I’ll let you know my exact office hours once they’ve sorted themselves out.

Course materials

I will make electronic copies of the readings available as the course progresses.

Course work and grades

Students will be required to turn in weekly homeworks. These will be checked but will not affect your course grade—unless you don’t turn them in, in which case I will deduct one point from your 100-point final grade for each homework not turned in. The homeworks will be nuts and bolts, nothing tricky. Their main function, in fact, is to show me how well you’re understanding the material.

Grades will be based on three exams and a final—some or all of which may be take-home—each counting for roughly 25% of your grade. I cannot be sure exactly when the exams will be scheduled yet—this depends on how things go in class. But I will try to distribute them evenly over the term, will give you plenty of notice, and will be flexible if you run into conflicts with other work.
Course topics

Here is a tentative, initial list. The list will be undergoing revision throughout the term (be sure to check the version number on the syllabus).

1. Default logic
   (a) Background and motivation
       Readings: Horty [10], Reiter [34]
   (b) Default logic
       Readings: Horty [11, Chapters 1 and 2], Reiter [33]
   (c) Alternative default logics
       Readings: Delgrande, Schaub, and Jackson [6]
   (d) Variable priorities and exclusion
       Background and related material: Pollock [17], Raz [32, Chapter 1]

2. An interlude on inheritance reasoning
   (a) Ancient work
       Readings: Horty [9]
   (b) Knoks
       Readings: Knoks [14]
   (c) Bastiaanse and Veltman
       Readings: Bastiaanse and Veltman [2]

3. Prioritized default logics
   (a) Order of application theories
       Readings: Baader and Hollunder [1], Brewka [3], Brewka [4]
   (b) Rintanen
       Readings: Rintanen [35]
   (c) Brewka and Eiter
       Readings: Brewka and Eiter [5]
   (d) An inheritance based theory
       Readings: Horty [11, Chapter 8]
   (e) Hansen’s approach
       Readings: Hansen [8]
   (f) Parent’s approach
       Readings: Parent [16]
   (g) Tucker’s approach
       Readings: Tucker [36]

4. Pollock’s work on defeasible reasoning
(a) Roots in epistemology
Readings: Pollock [17], Pollock [18, Chapters 1 and 2]
Background and related material: Pollock [24, Chapters 1 and 2], Pollock and Cruz [28]

(b) The 1987 theory
Readings: Pollock [19], Pollock [21], Pollock [22]
Background and related material: Dung [7], Prakken and Horty [30],

(c) Problems: self-defeat, lottery, preface
Readings: Pollock [20]

(d) The 1994/95 theory
Readings: Pollock [23], Pollock [24, Chapters 2, 3, and 4]
Background and related material: Dung [7], Jakobovits [12], Jakobovits and Vermeir [13], Prakken and Horty [30]

(e) Later work
Readings: Pollock [25], Pollock [26], Pollock [27]

5. Argument systems

(a) Abstract argumentation: basic definitions
Readings: Dung [7]
Background and related: Prakken and Vreeswijk [31]

(b) Abstract argumentation: labelings, dialogue
Readings: Prakken and Vreeswijk [31]

(c) Argumentation and Pollock’s theories
Readings: Dung [7]

(d) Argumentation and default logic
Readings: Dung [7]

(e) Structured argumentation
Readings: Prakken [29]
Background and related: Modgil and Prakken [15]

(f) Argumentation and priorities
Readings: Prakken [29]

References


