

Spring Semester, 2018
Instructor: John Horty

PHIL 478:
Logics for Defeasible Reasoning
Syllabus Version #1
January 25, 2018

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

Thursday and Thursday, 2:00 - 3:15, TWS 1321

Contact information

Office: Skinner Building, Rm. 1101. Office phone: I don't use my office phone. Personal cell phone: 301-408-8963. You are welcome to call my cell, but please keep it between 9:00am and 8:00pm. If I don't pick up, leave a clear message and I'll call you back. Email: horty@umiacs.umd.edu. Note: I'm not good at answering complicated questions by email, and prefer to meet in person or talk on the phone for that, but email is fine for quick administrative things, and for setting up appointments. Office hours: I'll let you know my exact office hours once they've sorted themselves out.

Course web site

<http://www.umiacs.umd.edu/users/horty/courses/2018-478>

Course materials

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

Course work and grades

Students will be required to turn in occasional homeworks. These will be checked but will not affect your course grade. Most of the homework exercises will be nuts and bolts, nothing tricky. Their main function is to show me how well you're understanding the material.

For undergraduates: Grades will be based on three exams—also nuts-and-bolts, some or all of which may be take-home—each counting for roughly 33% 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 or with religious observances.

For graduate students: You will have to do what the undergraduates do, but in addition, you'll have to help present some of the material, I'll ask you for a paper or a project. We can discuss this.

Policies

The course is subject to the various policies found here:

<http://www.ugst.umd.edu/courserelatedpolicies.html>

In addition, there is the further e-free policy: no laptops, phones, or other mobile devices can be used during class, unless you have a particular need to use a device of some sort for note-taking. If you are curious about the reasons for this policy, I can refer you to studies showing that classroom use of mobile devices interferes with learning.

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, and keep up with the web site).

1. Default logic

(a) Background and motivation

Readings: Horty [12], Horty [13, Introduction]

Background and related material: Reiter [37]

(b) Default logic

Readings: Horty [13, Chapters 1 and 2, Appendix A], Reiter [36, Sections 1 through 3]

(c) Alternative default logics

Readings: Delgrande, Schaub, and Jackson [7]

(d) Variable priorities and exclusion

Readings: Horty [13, Chapters 5 and 6]

Background and related material: Pollock [19], Raz [35, Chapter 1]

2. Pollock's work on defeasible reasoning

(a) Roots in epistemology

Readings: Pollock [19], Pollock [20, Chapters 1 and 2]

Background and related material: Pollock [27, Chapters 1 and 2], Pollock and Cruz [31]

- (b) The 1987 theory
Readings: Pollock [22], Pollock [24], Pollock [25]
Background and related material: Prakken and Horty [33],
 - (c) Problems: self-defeat, lottery, preface
Readings: Pollock [23]
 - (d) The 1994/95 theory
Readings: Pollock [26], Pollock [27, Chapters 2, 3, and 4]
Background and related material: Prakken and Horty [33]
 - (e) Later work
Readings: Pollock [28], Pollock [29], Pollock [30]
3. Argument systems
- (a) Abstract argumentation: basic definitions
Readings: Dung [8]
Background and related: Prakken and Vreeswijk [34]
 - (b) Abstract argumentation: labelings, dialogue
Readings: Prakken and Vreeswijk [34]
 - (c) Argumentation and Pollock's theories
Readings: Dung [8]
Background and related: Jakobovits [14], Jakobovits and Vermeir [15],
 - (d) Argumentation and default logic
Readings: Dung [8]
 - (e) Structured argumentation
Readings: Prakken [32]
4. Prioritized default logics
- (a) Order of application theories
Readings: Baader and Hollunder [1], Brewka [4], Brewka [5]
 - (b) Rintanen
Readings: Rintanen [38]
 - (c) Brewka and Eiter
Readings: Brewka and Eiter [6]
 - (d) An inheritance based theory
Readings: Horty [13, Chapter 8]
 - (e) Hansen's approach
Readings: Hansen [11]
5. Possible additional topics
- (a) Prioritization in argumentation
Readings: Liao et al. [17]

- (b) Input/output logic
Readings: Parent [18], Tucker [40], Tucker [39]
- (c) Reasons and oughts: other options
Readings: Bonevac [2], Bonevac [3], Fuhrmann [9], Fuhrmann [10]
- (d) Defeasible reasoning in epistemology
Readings: Lasonen-Aarnio [16], Pollock [21]

References

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