

Save Paper! Printed versions available at the school

NASSLI



***Fourth* North American Summer School in Logic, Language, and Information**

June 20–26, 2010

June 20 Tutorials

June 21–25 Courses

June 26 Dynamic Epistemic Logic Workshop

June 26 Student Session

Sponsors

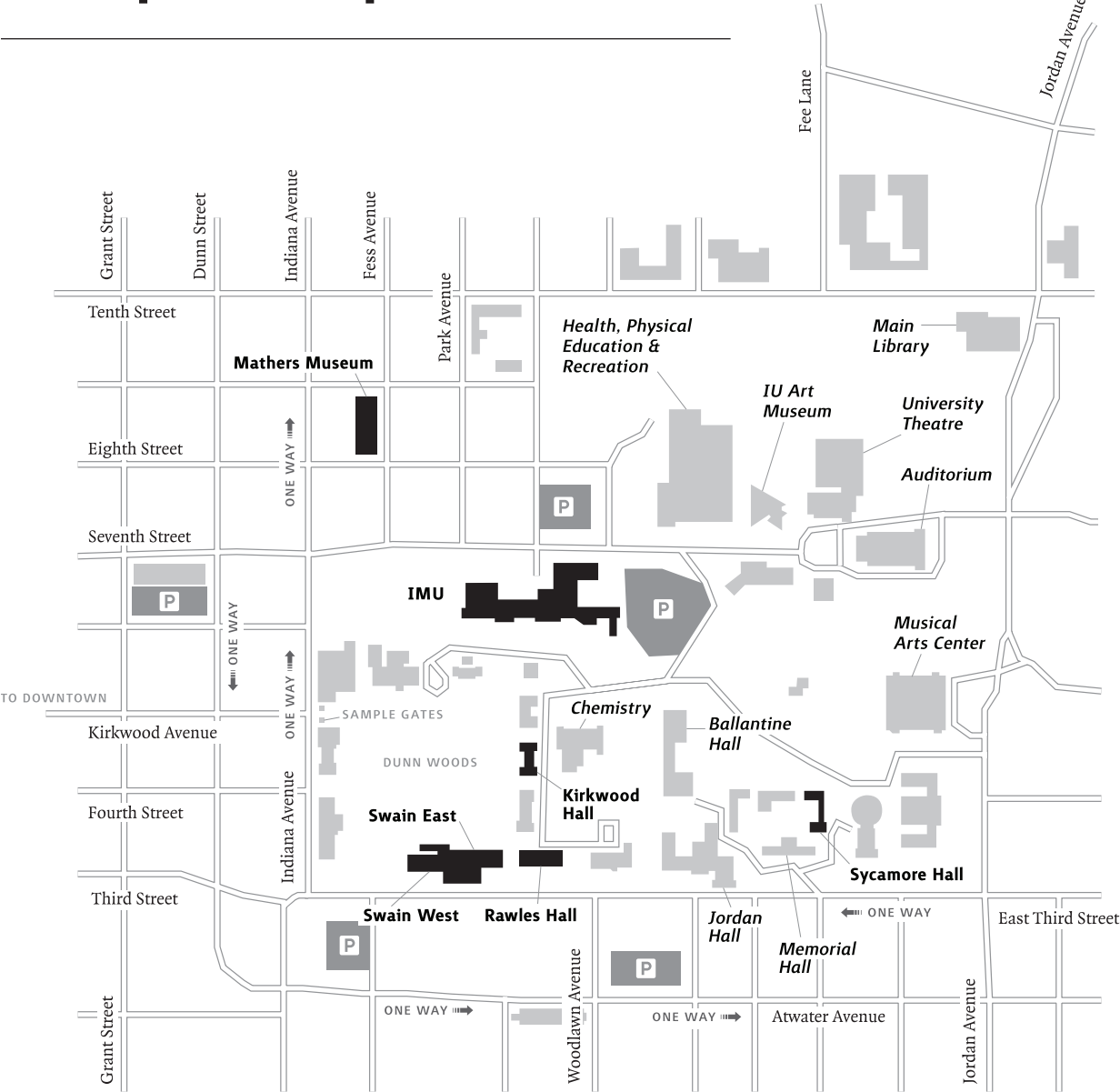
National Science Foundation

Association for Logic, Language and Information | Association for Symbolic Logic

Indiana University Cognitive Science Program | College of Arts and Sciences | School of Informatics and Computing | Departments of Linguistics, Mathematics, Philosophy
Program in Pure and Applied Logic

Stanford University Center for the Study of Language and Information

Campus Map



Key

- Conference building
- Other building
- University Parking

Contents

Campus Map | 2

Welcome and Introduction | 4

Schedule Day-By-Day | 5

Courses | 6

Tutorials, Workshops, Student Session | 7

Information, Talks | 8

Tutorial and Course Descriptions | 9

Casual and Fine Dining | 15

3

Main funding generously
granted by the
National Science
Foundation



INDIANA UNIVERSITY



NASSLLI 2010 Program Committee

David Beaver (committee chair), UT Austin | Thony Gillies, Rutgers University | John Horty, University of Maryland | Sandra Kübler, Indiana University | Eric Pacuit, Stanford University | Chris Potts, Stanford University, Dan Roth, University of Illinois, Urbana/Champaign | Chung-Chieh Shan, Rutgers University | Matthias Scheutz, Indiana University

NASSLLI Local Organizers

Saleh Aliyari | Eric Baucom | Emily Cahill | Rehj Cantrell | Thomas Decker | Markus Dickinson | Eli Drumm | David Fisher | Ryan Fitzpatrick | Qingfang Fu | Bing He | Josh Herring | Yu-Yin Hsu | Christian Hoffland | Ross Israel | Sandra Kuebler | Scott Ledbetter | Huina Mao | Tony Meyer | Emad Mohamed | Larry Moss | Jaimie Murdock | Marwa Ragheb | Ramyaa | Robert Rose | Alex Rudnick | Charese Smiley | Amber Smith | Janet Smith | Mikael Thompson | Wren Thornton | Larisse Vufo | Erik Wennstrom | Ning Yu

NASSLLI Steering Committee

David Beaver, UT Austin | Larry Moss (chair), Indiana University | Phokion Kolaitis, UC Santa Cruz / IBM Almaden Research Center | Valeria de Paiva, Cuill, Inc. | Stuart Shieber, Harvard University | Moshe Vardi, Rice University

Program designed and typeset by Christian Hoffland.

Copyright © 2010 Indiana University. Map copyright © 2010 Christian Hoffland. All rights reserved.

Welcome and Introduction

Welcome to the Fourth North American Summer School in Logic, Language, and Information: **NASSLLI '10.**

NASSLLI is a summer school with classes in the interface between computer science, linguistics, and logic.

After previous editions at Stanford University, Indiana University, and UCLA, we are pleased to welcome participants to the fourth NASSLLI at Indiana University, Bloomington, Indiana. The summer school, loosely modeled on the long-running ESSLLI series in Europe, consists of a number of courses and workshops, selected on the basis of the proposals.

Courses and workshops meet for 90 or 120 minutes on each of five days, June 21–25, and there will be tutorials on June 20 and a day-long series of workshops and student sessions on June 26. The instructors are prominent researchers who volunteer their time and energy to present basic work in their disciplines. Many are coming from Europe just to teach at NASSLLI.

NASSLLI courses are aimed at graduate students and advanced undergraduates in wide variety of fields. The instructors know that people will be attending from a wide range of disciplines, and they all are pleased to be associated with an interdisciplinary school. The courses will also appeal to post-docs and researchers in all of the relevant fields.

In addition to classes in the daytime, the evenings will have social events and plenary lectures. Bloomington is a wonderful place to visit, known for arts, music, and ethnic restaurants. All of this is within fifteen minutes walking from campus. We aim to make NASSLLI fun and exciting. Please make sure to read through this program for the details of the events.

We hope that you enjoy the school.

NASSLLI 2010 Program Committee

Schedule Day-By-Day

SUNDAY, JUNE 20

More information

5

Tutorials

7 | 9

9:00 a–4:30 p | Swain East 140

MONDAY, JUNE 21

Registration

8

8:00 a | Rawles Hall 107

Reception

8

7:00–8:30 p | Woodburn House, 519 North College Avenue

MONDAY, JUNE 21 TO FRIDAY, JUNE 25

Courses

6 | 9–14

9:00 a–5:30 p | Various rooms

WEDNESDAY, JUNE 23

Invited Lecture: Measuring Belief

8

Rohit Parikh

6:30–8:00 p | Rawles Hall 100

Refreshments will be served afterwards in Rawles Hall 107

THURSDAY, JUNE 24

Party!

8

7:00 p | Mathers Museum, 416 North Indiana Avenue

SATURDAY, JUNE 26

Workshop on New Directions in Dynamic Epistemic Logic

7 | 14

9:00–11:30 a | Swain East 140

Student Session

7

1:00–5:20 p | Swain East 140

Courses

See pages 9–14

	COMPUTATIONAL LINGUISTICS	LANGUAGE	LOGIC	DYNAMIC LOGIC
9:00	Statistical Models of Language John Paolillo Sycamore Hall 200	Imperative Meaning in Context Cleo Condoravdi and Sven Lauer Swain West 103	Applications of Intuitionistic Logics David McCarty Kirkwood Hall 212	Dynamic Epistemic Logic Hans van Ditmarsch Swain East 140
10:30	BREAK			
11:00	Computational Learning Theory Shalom Lappin Kirkwood Hall 212	Phonological Relationships in Linguistic Theory Kathleen Currie Hall Swain West 103	Logics: A Modal Perspective Carlos Areces and Patrick Blackburn Swain East 140	
12:30	LUNCH BREAK			
2:00	Dependency Parsing Sandra Kübler and Markus Dickinson Swain West 103	Minimalist Grammars Greg Koble Kirkwood Hall 212	Markov Logic Mathias Niepert Sycamore Hall 200	Multi-Agent Belief Dynamics Alexandru Baltag and Sonja Smets Swain East 140
3:30	BREAK			
4:00	Workshop on Inference from Text Larry Moss and Annie Zaenen Swain West 103	Natural Language Semantics Reinhard Muskens Swain East 140	Introduction to (Finitely) Many-Valued Logics Francis Jeffrey Pelletier Kirkwood Hall 212	Logics of Rational Agency Eric Pacuit Sycamore Hall 200
5:30				

SUNDAY, JUNE 20

Tutorials

See page 9

TUTORIALS SWAIN EAST 140

9:00 **Introduction to Logic**
Carlos Areces

11:00 **Basics of Formal Language Theory**
Larry Moss

12:00 **LUNCH BREAK**

1:00 **Modal and Epistemic Logic**
Hans van Ditmarsch

3:00 **BREAK**

3:30 **Panel Discussion: Computational Linguistics**
Markus Dickinson and Sandra Kübler

4:30

SATURDAY, JUNE 26

Workshops | Sessions

See page 14

NEW DIRECTIONS IN DYNAMIC EPISTEMIC LOGIC SWAIN EAST 140

9:00 **L_a , an Aspect-Oriented Multi-Modal Logic**
Arsene Sabas and Michael Boyer

9:40 **Moorean Phenomena in Epistemic Logic**
Wes Holliday and Thomas Icard

10:30 **Tracking the Truth, Keep Changing Your Beliefs! Or, Dynamic Belief Revision as a Learning Method**
Alexandru Baltag, invited speaker

11:30

STUDENT SESSION SWAIN EAST 140

1:00 **Constrained Scrambling in CCG: A Case Study in Japanese**
Wren Thornton

1:40 **German Impersonal Pronouns: Pragmatics and Semantic Differences** | Sarah Zobel

2:20 **A Game Theoretical Analysis of Slurs and Appropriate Use**
Adam Croom

3:00

BREAK

3:20 **Bounded Rational Probabilistic Epistemic Dynamics in Bilateral Bargaining Under Uncertainty** | Paul Varkey

4:00 **Disjunction Property and Finite Model Property For an Intuitionistic Epistemic Logic** | Yoichi Hirai

4:40 **Reasoning About Belief in Social Software Using Modal Logic**
Ronald de Haan

5:20

7

Information

Registration

Mon 8:00 a | Rawles Hall 107

For those who have not registered, or who registered and did not yet pay, there will be a formal registration.

Coffee Breaks

Mon–Fri 10:30–11:00 a, 3:30–4:00 p

Rawles Hall 107

Please note that we plan to give out specially-designed mugs for hot and cold drinks, and so we are not purchasing any additional cups for the school. The mugs will be available at the Monday morning registration and at the first break itself.

Reception

Mon 7:00–8:30 p

Woodburn House, 519 North College Avenue

There will be an opening reception on Monday evening in Woodburn House, which is about a 15-minute walk from where most of the NASSLLI classes are held. The reception will feature light snacks and live music. In addition, your registration packet includes a ticket for a soft drink, beer, or glass of wine. Following the reception, you may wish to eat dinner at one of the many downtown restaurants.

Party!

Thu 6:30 p | Mathers Museum, 416 North Indiana Avenue (near Eighth Street)

There will be a party on Thursday evening at the Mathers Museum, 416 North Indiana Avenue. This is about 15 minutes walking from Rawles Hall. The party will include dinner from Siam House.

Talks

INVITED LECTURE

8

Measuring Belief

Rohit Parikh

Wed 6:30–8:00 p | Rawles Hall 100

Knowledge is understood as justified true belief, plus something else, as we all know from Gettier. But if belief is an important component of knowledge, then in order to understand knowledge, we need to think more about belief.

Actual beliefs are not closed under logical inference, and they can be inconsistent with each other. Moreover, expressed belief may conflict with observed behavior. So we need something more refined than Kripke structures to deal with actual belief.

We point out that beliefs can be observed in two ways. One is by simply asking the agent and presuming that one is told the truth. The other way is to observe the choices made by an agent and inferring from these observations both the beliefs and the preferences of the agent.

This second way was pursued, among others, by Ramsey and Savage, and is, indeed the only way we have of assigning beliefs to infants and animals. But we still retain the “vanilla” notion of belief, namely beliefs ascertained by asking questions. Adults of course have both notions of belief and they are often, but not always, correlated with each other.

We will discuss these two ways of understanding belief, compare them with Tamar Gendler’s notion of “alief,” and also mention the experimental work of Verbrugge and her colleagues.

Tutorial and Course Descriptions

See pages 6–7 for overall schedule

TUTORIALS

Introduction to Logic

Carlos Areces

Sun 9:00–11:00 a | Swain East 140

In this tutorial are presented the basics of logic, focusing particularly on classical propositional logic and its syntax, semantics, notions of satisfiability, validity, entailment, and theorem.

Basics of Formal Logic

Larry Moss

Sun 11:00 a–12:00 p | Swain East 140

The basics of formal language theory are given, including regular and context-free languages, and also the Lambek Calculus.

Modal and Epistemic Logic

Hans van Ditmarsch

Sun 1:00–3:00 p | Swain East 140

The basics of modal and epistemic logic are presented, with an eye towards the course that will be taught by the same instructor on Dynamic Epistemic Logic, and also the courses by Eric Pacuit and by Alexandru Baltag and Sonja Smets.

Panel Discussion: Computational Linguistics

Markus Dickinson and Sandra Kübler

Sun 3:30–4:30 p | Swain East 140

The presenters lead a panel discussion on the major issues in computational linguistics for the next 10 years, and what kind of background should one acquire to enter the field.

COMPUTATIONAL LINGUISTICS

Computational Learning Theory and Poverty of the Stimulus Arguments

Shalom Lappin

Mon–Fri 11:00 a–12:30 p | Kirkwood Hall 212

This course is about arguments from the poverty of the stimulus (APS) and their consequences for discussions of language learnability. The course will cover topics in computational learning theory such as the Gold paradigm and probabilistic learning. Technical results have been invoked to argue for strong domain specific learning biases encoded as constraints on the hypothesis space of possible natural language grammars. The course will examine versions of the APS, and will argue that they depend upon problematic assumptions concerning the learning situation and the target class. By revising these assumptions, one arrives at more encouraging results for the classes of learnable languages, and for the tractability of grammar induction through domain general probabilistic learning algorithms. These results undermine learning theoretic versions of the

COURSE AND TUTORIAL DESCRIPTIONS

APS as a motivation for a strong bias theory of UG.

The course will be based the learning theoretic chapters of Alex Clark and Shalom Lappin (2010), *Linguistic Nativism and the the Poverty of the Stimulus*, Wiley Blackwell, Oxford.

Dependency Parsing

Sandra Kübler and Markus Dickinson

Mon–Fri 2:00–3:30 p | Swain West 103

Dependency-based methods for syntactic parsing are becoming more and more popular in the computational linguistics community. The aim of this course is to give an overview of the state of the art in dependency parsing, including computational methods for dependency analysis as well as available resources for different languages in terms of parsers and syntactically annotated data resources. After an introduction, in which the basic terms will be defined, the three main parsing methods for dependency parsing will be presented: dependency parsing based on dynamic programming techniques, dependency parsing as constraint satisfaction, and dependency parsing with deterministic parsing algorithms combined with machine learning techniques. The course will also give an overview of existing implementations and treebanks, followed by a discussion of the pros and cons of dependency parsing and an outlook on the expected developments in this area.

Statistical Models of Language

John Paolillo

Mon–Fri 9:00–10:30 a | Sycamore Hall 200

For the past fifteen years, increasing attention has focused on the application of statistical methods and estimation heuristics to Natural Language Processing. With the availability of large corpora, “empirical” approaches are able to produce acceptable system performance using linguistically simpler

forms of information. Unfortunately, the relationship of the models used in Natural Language Processing to the scientific goals of understanding the workings of natural language has become somewhat muddled. This course illustrates that this need not be so: if one begins with a clear conception of the process to be observed, and its relation to data, then a statistical model can be constructed which permits interesting questions to be asked and answered within the paradigm of statistics. This results in a truly empirical approach in which language-related heuristics are harnessed in a rigorous framework that permits specific questions to be addressed in an incremental programmatic fashion.

Workshop on Inference from Text

Larry Moss and Annie Zaenen

Mon–Fri 4:00–5:30 p | Swain West 103

This NASSLLI workshop runs concurrently with the courses. It mainly consists of papers submitted by authors and reviewed by a committee. The topic is the intersection between two areas of work: textual entailment as an area of natural language processing, and natural logic as an area of logic and natural language semantics. The first topic deals with a current challenge in the areas of question answering, information retrieval and extraction, and document summarization, the challenge of capturing inference in actual texts. The second topic is the attempt to provide logical systems for inference in small fragments of language, and to study the computational properties of those systems. Depending on the number of submissions, the workshop may also include overview talks on these topics. The committee includes Johan Bos (Sapienza University of Rome), Nissim Francez (Technion University), Bill MacCartney (Aardvark), Chris Manning (Stanford University), and the workshop organizers.

LANGUAGE**Imperative Meaning in Context****Cleo Condoravdi and Sven Lauer**

Mon–Fri 9:00–10:30 a | Swain West 103

This course is concerned with the performative effects of ‘conduct-guiding’ natural language utterances. Imperatives are the prototypical type of expression that can be used to bring about such effects: they can be used for a variety of functions, such as to command, request, permit, wish, concede, or give advice. Many other forms can be used as well. The interactional force such an expression can have on any given occasion of utterance depends on both the context and its conventional meaning. The challenge for theories of natural language is thus to get the division of labor between (conventional) semantic meaning and (non-conventional) pragmatic reasoning right, so as to correctly predict all (and only all) possible expression/context/force triples. The course will survey theories of imperatives in linguistic semantics, philosophy and logic with an emphasis on how well they rise to the challenge. It also develops an approach of its own. A basic knowledge of formal semantics is required.

Minimalist Grammars**Greg Kobele**

Mon–Fri 2:00–3:30 p | Kirkwood Hall 212

Research in the tradition of Chomsky’s minimalist program is often inaccessible to non-minimalists, partly because of the highly intuitive level at which much of the work in this tradition is conducted. This course will show how major components of recent Chomskian syntax can be expressed in formal grammars inspired by Stabler’s “minimalist grammar” (MG). Many MG variants have been rigorously related to well-understood formalisms such as multi-component tree adjoining grammars. As

a result, a wide range of Chomskian proposals can be understood and assessed by formally minded linguists from every linguistic tradition. Considering especially recent (empirically consequential) proposals about locality, copying operations, adjunction, and interfaces (phonetic, morphological, semantic), this formal treatment sometimes reveals surprising aspects of those proposals that have been obscured in the informal literature.

Natural Language Semantics**Reinhard Muskens**

Mon–Fri 4:00–5:30 p | Swain East 140

This course offers a quick-paced introduction to natural language semantics in the logical tradition initiated by Richard Montague. It is geared towards students who have a good working knowledge of (classical) logic but no previous exposure to natural language semantics. Some familiarity with linguistics would be helpful but is certainly not necessary. Students will leave with a good understanding of the essentials of semantics in the Montague tradition and be familiar with some classical analyses of semantic phenomena. They will also have a basic understanding of how some offshoots of the Montagovian paradigm, such as Situation Semantics and Discourse Representation Theory, relate to the original theory. Though the course is aimed at beginners, students who are already familiar with Montague’s theory may want to take the course nevertheless, because this course will present the essentials of semantics in a way which radically streamlines many of the standard presentations, and bring students to a considerable level of sophistication quickly.

Phonological Relationships in Linguistic Theory

Kathleen Currie Hall

Mon–Fri 11:00 a–12:30 p | Swain West 103

This course has three goals: (1) to provide a basic background in the definition and role of phonological relationships (contrast, allophony) in linguistic theory; (2) to introduce some of the many problems in the usual definitions of phonological relationships; and (3) to demonstrate how the tools of statistics and computational linguistics (probability, information theory, corpus-based approaches to linguistic description) can be used to solve these problems. Presenting the Probabilistic Phonological Relationship Model introduced by the instructor, the course also shows how to apply the model to corpora of linguistic data. This course will not only provide students with insights into the future of probabilistic phonology but also hands-on experience with applying mathematical models to linguistic data. Some specific background in phonology is useful but not necessary, as long as the student has general knowledge of linguistics or information theory.

LOGIC

Applications of Intuitionistic Logics

David McCarty

Mon–Fri 9:00–10:30 a | Kirkwood Hall 212

Intended for cognitive scientists, computer scientists, mathematicians, and philosophers with a course in logic, this course is an in-depth look at intuitionistic logics. It begins with a presentation of logics of expanding information. It includes interpretations over frames and topologies, and Heyting algebra. It also covers computational models and realizability, and topics related to computable

mathematics and set theory and algebra. Computational models of intuitionistic logic contain nonclassical sets that are potentially infinite and are able to represent the creative or expanding character of mathematical knowledge and human computation. This is related to the point that familiar models of mathematical cognition based upon standard formal systems and their elaborations do not adequately reflect the creativity of the mathematical mind. The course concludes with a survey of the answers provided by intuitionism to questions arising about language, including the question, “How large is a language?”

Logics: A Modal Perspective

Carlos Areces and Patrick Blackburn

Mon–Fri 11:00 a–12:30 p | Swain East 140

The course introduces a number of logics that are important in many modern scientific disciplines: propositional logic, modal and temporal logics, description logics, first-order logic, fix-point logic and second-order logic. It will introduce them in a way that makes clear both the underlying unity of these systems, their differences, possible uses and applications. Beginning with propositional logic, it presents logical languages of increasing strength for talking about relational structures, and in parallel it studies inference tasks (satisfiability, model checking, model building, etc.) and algorithms for them. The instructors believe that the course material is indispensable to a modern education in logic. Unfortunately, much of it is only currently available in advanced courses and textbooks. This course is designed to make this material accessible to an interdisciplinary audience, and it is based on a book being written by the instructors.

Markov Logic

Mathias Niepert

Mon–Fri 2:00–3:30 p | Sycamore Hall 200

Probabilistic logics are important due to their ability to simultaneously model ‘hard’ and ‘soft’ logical constraints. The difference between these is that hard constraints always hold, while soft ones typically hold. Given a collection of hard and soft constraints, probabilistic logics can infer the most likely alignment by computing one that satisfies all of the hard and most of the soft constraints. Markov logic is such a probabilistic logic, combining the theory of Markov networks with that of first-order logic. It originates in a 2006 paper by Richardson and Domingos. The course will include basic probability theory, then move to Markov logic itself. The last portion of the course will be devoted to applications in computational linguistics and the semantic web. An additional goal is to show students how to employ Markov logic in their own fields of research.

Introduction to (Finitely) Many-Valued Logics

Francis Jeffrey Pelletier

Mon–Fri 4:00–5:30 p | Kirkwood Hall 212

Over the decades there have been many proposals that suggest that our explanation of certain phenomena ought to be captured in part by a many-valued theory. This is most prominent in philosophy, but it also occurs in linguistics (especially semantics) and artificial intelligence. This course presents the variety of finitely-many-valued logics, and shows how to evaluate (at least on a superficial level) which of these logics are suitable to describe various phenomena. On the formal level, we will discuss issues of expressive completeness, of the possible interpretations of the logical operators using the non-standard truth values, and topics concerning deduction, such as

designated values, validity, and the deduction theorem. A general method for using many-valued semantic tableaux will be described for use on these logics. On a different level, we will investigate the logical relations among various of the well-studied many-valued logics, showing which logics are included in which other logics. The background knowledge of logic that is presumed is just classical propositional logic, either through a philosophy logic course, a linguistics semantics course, or a computing discrete math course.

13

DYNAMIC LOGIC

Dynamic Epistemic Logic

Hans van Ditmarsch

Mon–Fri 9:00–10:30 a | Swain East 140

Epistemic logic models knowledge and belief in multi-agent systems. The topic has been developed several ways and now is seen as a strand of modal logic with epistemic modal operators for knowledge and dynamic modal operators for knowledge and belief change. The course teaches the basics of Dynamic Epistemic Logic, focussing on the semantics and the applications. It includes: (i) epistemic logic (including group epistemic operators such as common knowledge), (ii) public announcement logic, (iii) action model logic (full expressive power, includes non-public events), (iv) recent developments (factual change, belief revision), (v) applications and puzzles (communication protocols, 100 prisoners, hangman paradox, etc). This course presupposes knowledge of the syntax and semantics of basic modal logic. Note that the day prior to NASSLLI classes there will be an intensive tutorial on related topics.

Logics of Rational Agency

Eric Pacuit

Mon–Fri 4:00–5:30 p | Sycamore Hall 200

This course will introduce logics for reasoning about communities of rational and not-so rational agents engaged in some form of social interaction. Much of this work builds upon existing logical frameworks developed by philosophers and computer scientists incorporating insights and ideas from philosophy, game theory, decision theory and social choice theory. The result is a web of logical systems each addressing different aspects of rational agency and social interaction. Rather than providing an encyclopedic account of these different logical systems, we will focus on the main conceptual and technical issues that drive a logical analysis. The main objective is to see the various logical systems as a coherent account of rational agency and social interaction. The course will not restrict attention to any one specific logical framework. Rather, the primary objective will be to discuss a number of different logical frameworks toward the goal of understanding how they work together.

Multi-Agent Belief Dynamics

Alexandru Baltag and Sonja Smets

Mon–Fri 2:00–3:30 p | Swain East 140

This course has a strong inter-disciplinary character, touching on issues of relevance to computer science, artificial intelligence, epistemology, game theory, social choice Theory, etc. It presents a family of logics for reasoning about belief dynamics in a multi-agent context. Phenomena to be modeled include single-agent belief revision, “updates” and “upgrades” induced by various types of learning, different forms of belief “merge” induced by various types of communication, as well as more complex belief-changing interactions such as deceitful communication,

bluffing, secrecy, wiretapping etc. The logics in this course descend from propositional dynamic logic, and they also incorporate ideas from belief revision theory and non-monotonic logics. This course is related to the NASSLLI course on Dynamic Epistemic Logic. This course presupposes knowledge of the syntax and semantics of basic modal logic. There will be a pre-NASSLLI tutorial day to help with this.

14

NEW DIRECTIONS IN DYNAMIC EPISTEMIC LOGIC

Hans van Ditmarsch and Eric Pacuit

Sat 9:00–11:30 a | Swain East 140

There is a growing interest in logics that reason about interaction in communities of rational and not-so rational agents. The goal of this one-day workshop is to explore these dynamic epistemic logics, in the broadest possible sense. Researchers from various fields including logic, game theory, artificial intelligence, philosophy, linguistics, and cognitive science will present a paper describing original or recently published work.

L_a , an Aspect-Oriented Multi-Modal Logic

Arsene Sabas and Michael Boyer

9:00–9:40 a | Swain East 140

Moorean Phenomena in Epistemic Logic

Wes Holliday and Thomas Icard

9:40–10:20 a | Swain East 140

Tracking the Truth, Keep Changing Your Beliefs! Or, Dynamic Belief Revision as a Learning Method

Alexandru Baltag, invited speaker

10:30–11:30 a | Swain East 140

Casual and Fine Dining

See page 2 for Campus Map

Key

- \$** Inexpensive
- \$\$** Average
- \$\$\$** Above average
- 🍷** Delivery available
- 🌿** Vegetarian options
- 📶** Wi-fi enabled

In the IMU

The Market, Burger King, Pizza Hut, Kiva **\$**
Fast food, Snacks 🍷
(812) 856-0379

Starbucks **\$**
Coffee 🍷

Sugar 'n' Spice **\$**
Coffee and Bakery

The Tudor Room **\$\$\$**
Buffet
(812) 855-1620

Fourth Street

Anatolia **\$\$\$**
Turkish
405 East Fourth Street
(812) 334-2991

Anyetsang's Little Tibet **\$\$\$**
Tibetan 🌿
415 East Fourth Street
(812) 331-0122

Ashenda's Abasha **\$\$\$**
Ethiopian
424 East Fourth Street
(812) 333-5522

Basil Leaf **\$\$\$**
Vietnamese
404 East Fourth Street
(812) 330-8978

Casablanca **\$\$\$**
Mediterranean 🌿
402 East Fourth Street
(812) 335-9048

Café Ami **\$**
Korean and Japanese
409 East Fourth Street
(812) 339-2735

Dats **\$\$\$**
Cajun, Creole 🍷
211 South Grant Street
(812) 339-3090

Dunn Inn **\$\$\$**
American 🌿
208 South Dunn Street
(812) 330-2002

Mandalay
International
413 East Fourth Street
(812) 339-7334

Puccini's La Dolce Vita **\$\$\$**
Italian
420 East Fourth Street
(812) 333-5522

Siam House **\$**
Thai 🌿
420 East Fourth Street
(812) 331-1233

Snow Lion **\$\$\$**
Tibetan 🌿
113 South Grant Street
(812) 336-0835

Indiana Avenue

Buffa Louie's **\$\$\$**
Wings 🍷
114 South Indiana Avenue
(812) 333-3032

Chow Bar **\$\$\$**
Asian
216 South Indiana Avenue
(812) 336-3888

Dagwood's Subs **\$**
Sandwiches 🍷 📶
116 South Indiana Avenue
(812) 333-3000

Penn Station **\$**
Sandwiches
212 South Indiana Avenue
(812) 333-7366

Qdoba **\$**
Mexican, Southwest
116 South Indiana Avenue
(812) 339-1122

Starbucks **\$\$\$**
Coffee 🍷
110 South Indiana Avenue
(812) 333-6075

Kirkwood Area

Bloomington Bagel **\$**
Bagels and Coffee 🍷 📶
113 North Dunn Street
(812) 333-4653

Café Django **\$\$\$**
International 🌿
116 North Grant Street
(812) 335-1297

Café Pizzeria **\$\$\$**
Pizza 🍷
405 East Kirkwood Avenue
(812) 332-2111

Chipotle Grill **\$**
Burritos 🌿
420 East Kirkwood Avenue
(812) 330-1435

Esan Thai
Thai
221 East Kirkwood Avenue
(812) 333-8424

Falafel's **\$\$\$**
Greek, Israeli
430 East Kirkwood Avenue
(812) 355-3555

Finch's Brasserie **\$\$\$**
Gourmet American 🌿
514 East Kirkwood Avenue
(812) 333-2700

Jimmy John's Deli **\$**
Sandwiches 🍷
430 East Kirkwood Avenue
(812) 332-9265

Kilroy's Bar and Grill **\$\$\$**
Bar and Grill 🍷
502 East Kirkwood Avenue
(812) 332-3700

Laughing Planet **\$**
Burritos 🌿
322 East Kirkwood Avenue
(812) 332-2233

Nick's English Hut **\$\$\$**
Bar and Grill 🍷
East Kirkwood Avenue
(812) 332-4040

Noodles & Company **\$\$\$**
Noodles
517 East Kirkwood Avenue
(812) 323-1400

Pita Pit **\$**
Pitas and Soup
530 East Kirkwood Avenue
(812) 355-3500

The Pour House Café **\$**
Coffee
314 East Kirkwood Avenue
(812) 339-7000

Runcible Spoon **\$\$\$**
Breakfast, Coffee, Sandwiches
412 East Sixth Street
(812) 334-3997

Shanti **\$\$\$**
Indian 🌿
221 East Kirkwood Avenue
(812) 333-0303

Soma **\$\$\$**
Coffee and Juice Bar
322 East Kirkwood Avenue
(812) 331-2770

The Farm **\$\$\$**
Indiana Gourmet 🌿
108 East Kirkwood Avenue
(812) 323-0002

Uncle D's Pizza **\$**
Pizza 🍷
430 East Kirkwood Avenue
(812) 339-2260

Village Deli **\$**
Breakfasts, Sandwiches 🍷 🌿 📶
409 East Kirkwood Avenue
(812) 336-2303

Downtown Area

Bloomington Bagel Company **\$**
Bagels and Coffee 🍷 📶
238 North Morton Street
(812) 349-4653

Bloomington Sandwich **\$\$\$**
Sandwiches 🍷
107 North College Avenue
(812) 330-9611

Bobby's Pub **\$**
American
100 College Avenue
(812) 330-0955

CASUAL AND FINE DINING

- Butch's** \$
New Jersey, Italian, Jewish
 120 East Seventh Street
 (812) 822-0210
- Coaches Lounge** \$\$
Bar and Grill
 24 North College Avenue
 (812) 339-3537
- Crazy Horse** \$\$
Bar and Grill 🍷
 214 West Kirkwood Avenue
 (812) 336-8877
- Grazie!** \$\$
Italian
 106 West Sixth Street
 (812) 323-0303
- Irish Lion** \$\$
Irish Bar and Grill
 212 West Kirkwood Avenue
 (812) 336-9076
- Janko's Little Zagreb** \$\$\$
Steakhouse
 223 West Sixth Street
 (812) 332-0694
- Japonee** \$\$
Asian
 320 North Walnut Street
 (812) 333-3122
- Kilroy's Sports Bar** \$\$
Bar and Grill 🍷 🍷
 319 North Walnut Street
 (812) 333-6006
- Malibu Grill** \$\$
Grill
 106 North Walnut Street
 (812) 333-6006
- Max's Place** \$\$
Pizza and Pub
 109 West Seventh Street
 (812) 336-5169
- Michael's Uptown Café** \$\$\$
American and Cajun ☑️ 🍷
 102 East Kirkwood Avenue
 (812) 339-0900
- Opie Taylor's** \$\$
Bar and Grill 🍷
 110 North Walnut Street
 (812) 333-7287
- Le Petite Café** \$\$
French
 308 West Sixth Street
 (812) 334-9747
- Restaurant Tallent** \$\$\$
American Fine Dining ☑️
 208 North Walnut Street
 (812) 330-9801
- Roots** \$
Vegetarian Food and Juice Bar ☑️
 124 North Walnut Street
 (812) 336-7668
- Samira** \$
Afghan ☑️
 100 West Sixth Street
 (812) 331-3761
- Scholar's Inn Bakehouse** \$
Bakery and Sandwiches 🍷
 125 North College Avenue,
 3002 East Third Street
 (812) 331-6029
- Scotty's Brewhouse** \$\$
Burgers and Grill
 302 North Walnut Street
 (812) 333-5151
- Stefano's Ice Café** \$
Ice Cream, Coffee 🍷
 101 West Kirkwood Avenue
 (812) 331-0575
- Trojan Horse** \$\$
Greek ☑️
 100 East Kirkwood Avenue
 (812) 332-1101
- The Mac Grill** \$\$
International
 1434 East Third Street
 (812) 334-9100
- Mother Bear's Pizza** \$\$
Pizza
 1428 East Third Street
 (812) 332-4495
- Tina's Cuisine** \$
Gourmet Groceries and Sandwiches ☑️ ☑️
 309 East Third Street
 (812) 332-0464
- Turkuaz Café** \$\$
International 🍷
 301 East Third Street
 333-7908
- Yogi's Bar and Grill** \$
Burgers and Grill
 519 East Tenth Street
 (812) 323-9644
- Axis Night Club** \$\$
 419 North Walnut Street
 (812) 332-0402
- Bears Place** \$\$
 1316 East Third Street
 (812) 339-3460
- Bluebird Nightclub** \$
 216 North Walnut Street
 (812) 336-3984
- Bobby's Pub** \$
 101 West Kirkwood Avenue
 (812) 330-0955
- Bullwinkles** \$
 201 South College Avenue
 (812) 334-3232
- Chili's Grill and Bar** \$
 2811 East Third Street
 (812) 334-0535
- Crazy Horse** \$
 214 West Kirkwood Avenue
 (812) 336-8877
- Fifty-Six Degrees Bar** \$
 1131 South College Mall Road
 (812) 330-1111
- Jake's Nightclub** \$
 419 North Walnut Street
 (812) 332-0402
- Kilroy's Sports Bar** \$
 319 North Walnut Street
 (812) 333-6006
- Night Moves** \$
 1730 North Walnut Street
 (812) 335-1850
- Office Lounge** \$
 3900 East Third Street
 (812) 332-0911
- Players Pub** \$
 424 South Walnut Street
 (812) 334-2080
- Sunset Tavern** \$
 400 West Eleventh Street
 (812) 332-7702
- Uncle Elizabeth's** \$
 502 North Morton Street
 (812) 331-0060
- Uncle Fester's** \$
 430 East Kirkwood Ave Ste 7
 (812) 323-1023
- Upstairs Pub** \$
 430 East Kirkwood Avenue
 (812) 333-3003
- Video Saloon** \$
 105 West Seventh Street
 (812) 333-0064
-
- Further Afield**
- Chocolate Moose** \$
Ice Cream
 401 South Walnut Street
 (812) 333-0475
- Lennie's** \$
Bar and Grill, Pizza
 1795 East Tenth Street
 (812) 323-2112
- Raggazzi Art Café** \$
Italian
 212 South Rogers Street
 (812) 323-9005
- Sobon** \$
Korean
 1811 East Tenth Street
 (812) 333-1004
- Scholar's Inn** \$
American Fine Dining
 717 North College Avenue
 (812) 332-1892
- Truffle's 56 Degrees** \$
American Fine Dining
 1131 South College Mall
 (812) 330-1111
- Upland Brewing Company** \$
Bar and Grill
 245 North Walnut Street
 (812) 336-2337
-
- Other Spots Near Campus**
- Ami** \$
Japanese
 1500 East Third Street
 (812) 339-7868
- Bear's Place** \$
Bar and Grill
 1316 East Third Street
 (812) 339-3460
- Big Mouth Subs** \$
Sandwiches ☑️
 1420 East Third Street
 (812) 323-8987
- City Bakery** \$
Coffee
 1318 East Third Street
 (812) 323-9904
- Copper Cup** \$
Coffee 🍷
 1400 East Third Street
 (812) 323-8492
 415 North College Avenue
 (812) 323-8454
- Dragon Express** \$
Asian
 1400 East Third Street
 (812) 331-7030
-
- Bars and Clubs**
- The Alley**
 210 West Kirkwood Avenue
 (812) 336-2216