

Project for 276 2013. Focused on Probabilistic Programming

Project reports requirements:

In addition to project presentation you need to submit project reports due on our meeting on Tuesday 3-5 of the finals week, June 11. The report includes a summary of the paper/tutorial and more important any account of any original work that you did yourself. Your thought/critique of it, any additional work (modeling a problem, evaluating or any additional work you did). Depending on its nature it can be anywhere between 4-8 pages and if there is any additional material you wish to include it should be part of the appendix.

Summary of schedule presentations:

Tuesday June 4: Team 3 and team 6
Thursday June 6, 11-12:30: Teams 4,5, and 2
Thursday June 6, 1-2: Teams 1 and 7
Tuesday (3:30-5): teams 8 and 9

List of Projects for CS 276 S13

Team 1: Abdullah Abdulrahman Alamoudi
schedule: 6/6 Thursday (1-2 slot)

Effective Bayesian Inference for Stochastic Programs

Paper:

Daphne Koller, David McAllester, and Avi Pfeffer. "Effective Bayesian Inference for Stochastic Programs." AAI-97

Team 2: Chris Van Wagenen
scheduled: Thursday

Tutorial on Church

Paper:

Noah D. Goodman, Vikash K. Mansinghka, Daniel M. Roy, Keith Bonawitz, and

Joshua B. Tenenbaum. "Church: a language for generative models." UAI-08

Team 3: Michael Stewart
Scheduled: Tuesday 6/4

A tutorial or a project using the "PRL" language.

Papers:

[1] Nir Friedman, Lise Getoor, Daphne Koller, and Avi Pfeffer. "Learning Probabilistic Relational Models." IJCAI-99

[2] Lise Getoor, John Grant. "PRL: A Probabilistic Relational Language." Journal of Machine Learning 2006

Team 4: John Brock and Bryan Cutler
A Blog tutorial.
schedule: Thursday

Team 5: Jianlin Shi and Geng Ji
Scheduled: Thursday 6/6

Learning Relational Structure for Temporal Relation Extraction

Paper:

Tushar Khot, Siddharth Srivastava, Sriraam Natarajan and Jude Shavlik. "Learning Relational Structure for Temporal Relation Extraction." StaRAI-12

Team 6: Kevin Bache and Moshe Lichman
Scheduled: Tuesday 6/4

A tutorial on Figaro

Team 7: Pramodh Prabhakar

Refining an Automatically Extracted Knowledge Base using Markov Logic
Schedule: Thursday

Description: Implementation of the algorithm presented in the paper [1] for refining a Knowledge Base using Markov Logic

Papers:

[1] Lowd, Shangpu Jiang Daniel, and Dejing Dou. "Using Markov Logic to Refine an Automatically Extracted Knowledge Base." StaRAI-2012

[2] P. Domingos and D. Lowd. Markov logic: An interface layer for artificial intelligence. Synthesis Lectures on Artificial Intelligence and Machine Learning, 3(1):1–155, 2009

[3] A. Carlson, J. Betteridge, B. Kisiel, B. Settles, E. R. Hruschka, Jr., and T. M. Mitchell. Toward an architecture for never-ending language learning. In AAI-2010, 2010

Team 8: Junkyu Lee
scheduled: 11th week

Study on the Lifted Inference Based on Stochastic Sampling (using MLN)

Team 9: Rozita Rahimi, Negar Aref

Tutorial on The Markov Logic Language

Updated information: We want to focus on languages from the group:

Figaro (IBAL)

Blog,

Markov Logic

Church-

Students are encouraged to select a focus on one of these languages and to provide tutorial and example.

Main sources of information:

1. [Probabilistic-Programming.org \(a wiki\)](http://Probabilistic-Programming.org): This website serves as a repository of links and information about probabilistic programming languages, including both academic research spanning theory, algorithms, modeling, and systems, as well as implementations, evaluations, and applications. If you would like to contribute to this site, please contact Daniel Roy. The site is still under construction: please help us link to relevant projects and research!

[NIPS 2012 Workshop: Probabilistic Decision Programming with Figaro](#)

2. Markov Logic: An Interface Layer of Artificial Intelligence (Pedro Domingos and Daniel Lowd) ([pdf](#)) ([print](#))
3. Statistical Relational Learning book: : <http://www.cs.umd.edu/srl-book/> (Edited by Lise Getoor and Ben Taskar)
4. [3rd Statistical Relational AI \(StaRAI-13\)](#) workshop at [AAAI '13](#)

Software

Alchemy: Learning and Inference in Markov Logic Networks
(<https://code.google.com/p/alchemy-2/>)

Church, a probabilistic programming language
(<http://projects.csail.mit.edu/church/wiki/Church>)

People

1. [Avi Pfeffer](#)
2. [Stuart Russell](#)
3. [Pedro Domingos](#)
4. [Vibhav Gogate](#)
5. [Lise Getoor](#)
6. [David Poole](#)

For each we can seek: Language, Algorithms, Tutorials

Papers

- [Lifted First-Order Probabilistic Inference](#)
Rodrigo de Salvo Braz and Eyal Amir and Dan Roth
- [Lifted inference: normalizing loops by evaluation](#)
Oleg Kiselyov, Chung-chieh Shan
- [Figaro: An Object Oriented Probabilistic Programming Language](#) ([tutorial slides](#))
Avi Pfeffer
- [Probabilistic Theorem Proving](#)
Vibhav Gogate and Pedro Domingos
- [On Lifting the Gibbs Sampling Algorithm](#)
Deepak Venugopal and Vibhav Gogate

- [Advances in Lifted Importance Sampling](#)
Vibhav Gogate et al.
- [Effective Bayesian Inference for Stochastic Programs](#)
Koller, Pfeffer, and McAllester
- [Exploiting Uniform Assignments in First-Order MPE](#)
Udi Apsel and Ronen I. Brafman, UAI 2012
- [Lifted Relational Variational Inference](#)
Chois and Amir, UAI 2012
- [Lifted Relax, Compensate and then Recover: From Approximate to Exact Lifted Probabilistic Inference](#)
Darwiche, et. al, UAI 2012

Papers from StaRAI-2012 (workshop at UAI 2012)

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- [From Lifted Inference to Lifted Models](#)
Daan Fierens and Kristian Kersting.
 - [Generalized Counting for Lifted Variable Elimination](#)
Nima Taghipour and Jesse Davis.
 - [Random Regression for Bayes Nets Applied to Relational Data](#)
Oliver Schulte, Hassan Khosravi, Tianxiang Gao and Yuke Zhu.
 - [Nonparametric Relational Hybrid Models](#)
Jaesik Choi and Eyal Amir.
 - [Probabilistic Soft Logic for Trust Analysis in Social Networks](#)
Bert Huang, Angelika Kimmig, Lise Getoor and Jennifer Golbeck.
 - [Using Markov Logic to Refine an Automatically Extracted Knowledge Base](#)
Shangpu Jiang, Daniel Lowd and Dejing Dou.
 - [Accelerating Imitation Learning in Relational Domains via Transfer by Initialization](#)
Sriaram Natarajan, Phillip Odom, Saket Joshi, Tushar Khot, Kristian Kersting and Prasad Tadepalli.
 - [Slice Normalized Dynamic Markov Logic Networks](#)
Tivadar Papai, Henry Kautz and Daniel Stefankovic.
 - [Creating and Manipulating Probabilistic Programs with Figaro](#)
Avi Pfeffer.
 - [On Lifting the Gibbs Sampling Algorithm](#)
Deepak Venugopal and Vibhav Gogate.
 - [Lifted Arbitrary Constraint Solving for Lifted Probabilistic Inference](#)
Rodrigo de Salvo Braz, Shahin Saadati, Hung Bui and Ciaran O'Reilly.
 - [First-Order Models for POMDPs](#)
Siddharth Srivastava, Stuart Russell and Avi Pfeffer.
 - [Initial Empirical Evaluation of Anytime Lifted Belief Propagation](#)
Richard G. Freedman, Rodrigo de Salvo Braz, Hung Bui and Sriaram Natarajan.
 - [Learning Relational Structure for Temporal Relation Extraction](#)
Tushar Khot, Siddharth Srivastava, Sriaram Natarajan and Jude Shavlik.

- [*Evaluating Inference Algorithms for the Prolog Factor Language*](#)
Tiago Gomes and Vítor Santos Costa.
- [*Liftability of Probabilistic Inference: Upper and Lower Bounds*](#)
Manfred Jaeger and Guy Van Den Broeck.
- [*Integrating Human Instructions and Reinforcement Learners : An SRL Approach*](#)
Pradyot Korupolu V N, S S Manimaran, Balaraman Ravindran and Sriraam Natarajan.
- [*Aggregation and Population Growth: The Relational Logistic Regression and Markov Logic Cases*](#)
David Poole, David Buchman, Sriraam Natarajan and Kristian Kersting.
- [*Combining Logic, Continuous Parameters and Markov Decision Processes Using Hybrid ASP*](#)
Alex Brik and Jeffrey Remmel.
- [*Automorphism Groups of Graphical Models and Lifted Variational Inference*](#)
Hung Bui, Tuyen Huynh and Sebastian Riedel.
- *Convex Adversarial Collective Classification*
Mohamadali Torkamani and Daniel Lowd.
- [*A Dynamic Programming Algorithm for Inference in Recursive Probabilistic Programs*](#)
Andreas Stuhlmüller and Noah Goodman.
- [*Lifted Probabilistic Inference: An MCMC Perspective*](#)
Mathias Niepert.
- [*A Particle Filter for Probabilistic Dynamic Relational Domains*](#)
Davide Nitti, Tinne De Laet, McElory Hoffmann, Ingo Thon, Guy Van den Broeck and Luc De Raedt.

Here is a link to projects in 2007 that had a similar focus:

<http://www.ics.uci.edu/~dechter/courses/ics-275b/Fall-2007/projects.html>

Papers from UAI 2012

<http://www.auai.org/uai2012/schedule.shtml>

