

User Guide for Lifted Inference Algorithms(Alchemy 2.0)

Exact Inference

Computes the partition function and marginals of query atoms exactly. Uses the probabilistic theorem proving (PTP) algorithm.

e.g. `./liftedinfer -ptpe true -i ../exdata/test.mln -q queryAtom`

Lifted Blocked Gibbs

Clustering(-cls)

Used to compute feasible clusters that are sampled as blocked in the lifted blocked gibbs algorithm

Variants: i)Sequential clustering, ii)Randomized clustering

e.g. `./liftedinfer -cls true -oc cluster.cls -i ../exdata/exp1out.mln -e ../exdata/exp1test.db`

Sampling (-lvg)

Used to compute the marginal distribution of query atoms. Samples from a given clustering (may be none)

e.g. `./liftedinfer -lvg true -i ../exdata/exp1out.mln -e ../exdata/exp1test.db -q test`

Parallel clustering,sampling(-lvgc)

Samples from improved clusters in parallel with computing the clusters.

e.g. `./liftedinfer -lvgc true -i ../exdata/exp1out.mln -e ../exdata/exp1test.db -q test`

Lifted Importance Sampling (-lis)

Used to compute the partition function and also for approximate marginal estimation of query atoms

Variants: i)Uniform proposal distribution ii)Binomial proposal distribution iii) Informed proposal distribution that is adaptively improved: InformedV1: more accurate, more groundings may occur in proposal construction Informed: lesser groundings during proposal construction

e.g. `./liftedinfer -lis true -imd 0 -i ../exdata/exp1out.mln -e ../exdata/exp1test.db -q student`

Automated tests for exact inference

Run different tests to test functionality of the implementations against known ground truth values. The files for the automated tests are in exdata/autotestmlnfiles which can be extended further with other tests.

`./runliftedinfertests testfolder number_of_tests`;e.g. `./runliftedinfertests ../exdata/autotestmlnfiles/ 5`

Weight Learning

Use lifted gibbs as the inference step in discriminative weight learning

e.g. `./learnwts -infer -lvg true -maxSteps 25 -burnMaxSteps 50 -dNumIter 50 -d -i ../exdata/univ3.mln -o ../exdata/univ3-out.mln -t ../exdata/univ-train3.db -ne student`