CS492: Probabilistic Programming

Implementing Inference Algorithms for Probabilistic Programs

Hongseok Yang
KAIST

Two approaches

- Translation to a known probabilistic model.

- Inference by evaluation.

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Inference by evaluation

View an inference algorithm for prob. programs as a non-standard interpreter.

Plan

- Blackboard lecture.

- Look at the lecture note, "Note6.pdf".

```
((fn [x1]
    (if (> x1 0) (+ x1 2) (- x1 2)))
  (sample (normal 0 1)))
```

```
(let [x1 (sample (normal 0 1))
      x2  (if (> x1 0)
              1
              (sample (normal (* x1 x1) 4)))
      x3  (observe (normal x2 1) 3)]
  (list x1 x2))
```

Syntactic sugar

(let [] e)
= e
(let [x1 e1 x2 e2 ... xn en] e)
= ((fn [x1] (let [x2 e2 ... xn en] e)) e1)