Markovian Streams & Event Queries

A Markovian stream is a compact representation of a probability distribution over sequences.

Markovian streams are imprecise: at each instant, Bob is in several possible locations, each with some probability.

Markovian streams are temporally correlated: Bob’s uncertain location at time \( t \) is related to his uncertain location at time \( t + 1 \).

Event queries:

- Search for sequences within a Markovian stream.
- Are represented as NFAs.
- Are either fixed-length (no loops) or variable-length (contain self-loop edges).

The result of an event query on a Markovian stream is a set of tuples \( < q, p > \) indicating the probability \( p \) with which the event query is satisfied at each instant \( t \).