University of Maryland
Contribution to CoAX 2002
http://www.cs.umd.edu/projects/impact
Robert Ross, robross@cs.umd.edu
V.S. Subrahmanian, vs@cs.umd.edu

Description:

- Integration of IMPACT (the Interactive Maryland Platform for Agents Collaborating Together) with the CoABS Grid
- IMPACT enables agents that can efficiently store, manipulate, query, and reason over data that includes events, times, and probabilities
- Our IMPACT agents use probabilistic temporal data that is generated by our predictions for the future locations of targeted vehicles

Prediction - Creation:

- Generate several prediction models by varying the following features and then smoothing the results:
  - Focus: Observed positions or anticipated destinations (i.e., asset locations)
  - Calculation method: Linear, quadratic, periodic, and cubic regression for \( X = f(t) \) and \( Y = g(t) \)
  - Time window: Number of observations to consider
- Combine predictions into a uniform model that excludes nogo areas

Prediction - Filtration:

- Can return a probability matrix where
  - Identifier: Match a given id
  - Time slice: Pertains to a single instant \( t \)
  - Space: Within a bounding box
- Can instead return windows of size \( WinX \times WinY \) that also satisfy the following constraints:
  - Probability: Exceed a threshold
  - Cardinality: Return most nonoverlapping windows
  - Utility: Only return windows that are within reach of some attacker