PLACE: A Query Processor for Handling Real-time Spatio-temporal Data Streams

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Challenges of Spatio-temporal Streams
- Data expiration (Predicate-based window queries)
- Scalability
  - Massive number of objects
  - Massive number of continuous queries
- Continuous evaluation
- Query/Object combinations
  - Stationary queries / Moving objects
  - Stationary queries / Moving objects
  - Moving queries / Moving objects

Spatio-temporal Operators
- Negative tuples are produced from continuous sliding predicate-based window
- Tuples are expired out-of-order. In contrast to First-In-First-Expire as in sliding time-based window queries

Uncertainty in Continuous Queries
- Moving range queries
- Stationary kNN queries
- Predicting the result

Extended SQL Syntax
REGISTER QUERY query_name AS
SELECT select.clause
FROM from.clause
WHERE where.clause
INSIDE inside.clause
kNN kNN.clause
WINDOW window.clause

Architecture

Server

Client (1)

Client (2)