JIST:
Java In Simulation Time

Transparent Parallel and Optimistic Execution of Parallel Discrete Event Simulations

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http://www.cs.cornell.edu/barr/repository/jist/jist-spinglass.ppt
motivation

ad hoc network simulations lack...

- scalability
  - ns2 is the gold standard
  - PDNS (uses RTI-KIT)

or

- detail
  - approximate physical level
  - packet level
discrete event simulation

- simulation
  - state
  - time
  - event queue

- event queue
  - events
  - temporal ordering

- events
  - change state
  - generate events
java in simulation time

• Java-based simulation framework

• runs simulations
  • efficiently
    • in parallel
    • optimistically
  • transparently

• simulations written in plain Java
serial simulation time

- program state in objects
- objects partitioned among entities
- separators of state, time
- serial execution

- inject orthogonal code
  - inspection, node mobility, debugging
parallel simulation time

- lock-step in simulation time
  - concurrent events
  - conservative
- separators
  - location-independence
  - entity tracking
- balance load
- minimize network overhead
optimistic simulation time

- checkpoint entities
- cascade undo
  - cancellation
  - propagation

- rollback interface
  - automatic rollback method generation
- balance forward progress of time
evaluation

• **SWANS**
  - Scalable Wireless Ad hoc Network Simulator

• **prototype**
  - physical: propagation, reception
  - link: 802.11b
  - routing: DSR or ZRP
  - application: CBR
  - mobility model
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Thank you.

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