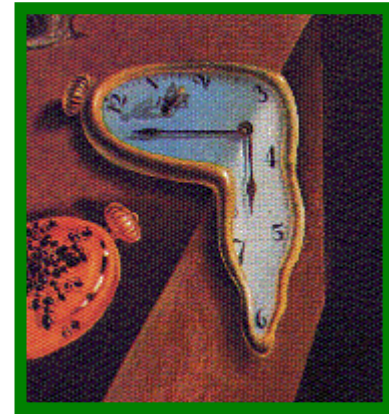


JIST:
Java In Simulation Time



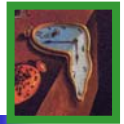
**Transparent Parallel and
Optimistic Execution of
Parallel Discrete Event Simulations**

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11 December 2002**

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

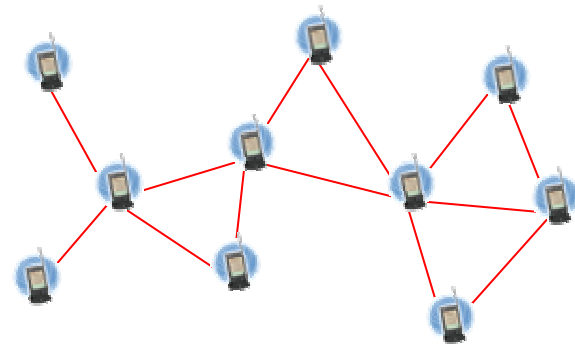


ad hoc network simulations lack...

- **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**

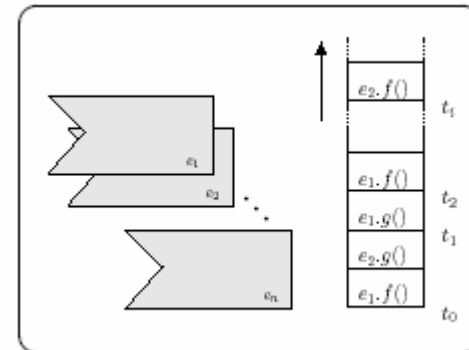
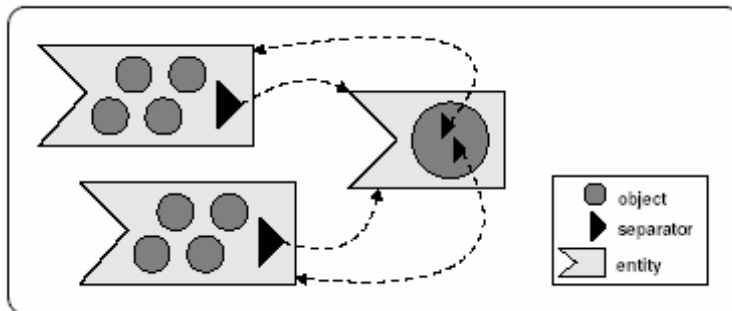


- **Java-based simulation framework**
- **runs simulations**
 - **efficiently**
 - **in parallel**
 - **optimistically**
 - **transparently**
- **simulations written in plain Java**

serial simulation time



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

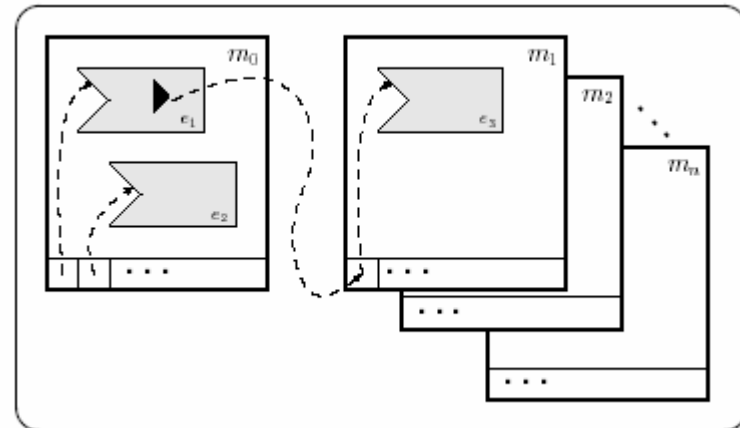


- **inject orthogonal code**
 - **inspection, node mobility, debugging**

parallel simulation time



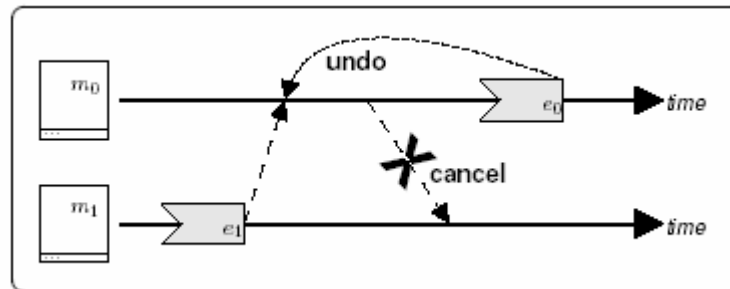
- **lock-step in simulation time**
 - concurrent events
 - conservative
- **separators**
 - location-independence
 - entity tracking
- **balance load**
- **minimize network overhead**



optimistic simulation time



- **checkpoint entities**
- **cascade undo**
 - **cancellation**
 - **propagation**

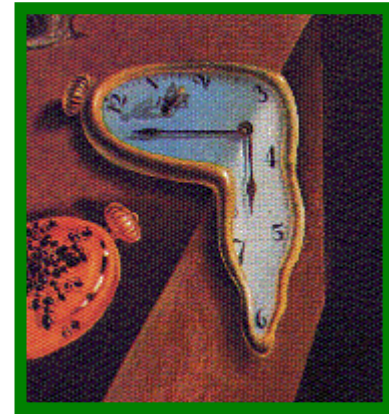


- **rollback interface**
 - **automatic rollback method generation**
- **balance forward progress of time**



- **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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