



A Fine-Grain Time-Sharing Time Warp System

Article in ACM Transactions on Modeling and Computer Simulation 27(2):1-25 · May 2017

DOI: 10.1145/3013528



1st [Alessandro Pellegrini](#)
10.97 · Sapienza University of Rome



2nd [Francesco Quaglia](#)
28.35 · Sapienza University of Rome

Abstract

Several techniques have been proposed to improve the performance of Parallel Discrete Event Simulation platforms relying on the Time Warp (optimistic) synchronization protocol. Among them we can mention optimized approaches for state restore, as well as techniques for load balancing or (dynamically) controlling the speculation degree, the latter being specifically targeted at reducing the incidence of causality errors...

Do you want to read this article?

Request the full-text to ask the authors to provide the full-text version.

[Request full-text](#)

Citations 0

References 39

Comments [Add yours](#)

Similar research

Transparent incremental state saving in time warp parallel discrete event simulation

Article · Jul 1996 · ACM SIGSIM Simulation Digest

Robert Rönngren Michael Liljenstam Rassul Ayani Johan Montagnat

[Request full-text](#)

0 Comments 22 Citations

Autonomic state management for optimistic simulation platforms

Article · Jan 2014

R. Vitali A. Pellegrini F. Quaglia

[Request full-text](#)

0 Comments 7 Citations



Conference Paper · Jun 2015

Davide Cingolani Alessandro Pellegrini Francesco Quaglia

[Request full-text](#)

0 Comments 7 Citations

Conjoining Emulation and Network Simulators on Linux Multiprocessors

Conference Paper · Jun 2015

Jereme Lamps Vladimir Adam David M. Nicol Matthew Caesar

[Request full-text](#)

0 Comments 3 Citations

NUMA Time Warp

Conference Paper · Jun 2015

Alessandro Pellegrini Francesco Quaglia

[Request full-text](#)

0 Comments 1 Citation

Parallel Discrete Event Simulation

Article · Jan 1988

Richard M. Fujimoto

[Request full-text](#)

0 Comments 848 Citations

XSim :real-time analytic parallel simulations

Conference Paper · Jan 2002

C.D. Carothers

[Request full-text](#)

0 Comments 4 Citations

TimeKeeper: a lightweight virtual time system for linux

Article · May 2014

Jereme Lamps David M. Nicol Matthew Caesar

[Request full-text](#)

0 Comments 10 Citations

Parallel Discrete Event Simulation for Multi-Core Systems: Analysis and Optimization

Article · Jun 2014 · IEEE Transactions on Parallel and Distributed Systems

Jingjing Wang Deepak Jagtap Nael Abu-Ghazaleh Dmitry Ponomarev

[Request full-text](#)

0 Comments 15 Citations

Warp speed: Executing time warp on 1,966,080 cores

[Read full-text](#)

0 Comments 46 Citations

Consistent and efficient output-streams management in optimistic simulation platforms

Full-text available · Conference Paper · May 2013

Francesco Antonacci Alessandro Pellegrini Francesco Quaglia

[Read full-text](#)

0 Comments 6 Citations

Transparent Multi-Core Speculative Parallelization of DES Models with Event and Cross-State Dependencies

Full-text available · Conference Paper · May 2014

Alessandro Pellegrini Francesco Quaglia

[Read full-text](#)

0 Comments 9 Citations

Load sharing for optimistic parallel simulations on multi core machines

Full-text available · Article · Aug 2012 · ACM SIGMETRICS Performance Evaluation Review

Roberto Vitali Alessandro Pellegrini Francesco Quaglia

[Read full-text](#)

0 Comments 11 Citations

The ROME OpTimistic Simulator: Core Internals and Programming Model

Full-text available · Conference Paper · Jan 2011

Alessandro Pellegrini Roberto Vitali Francesco Quaglia

[Read full-text](#)

0 Comments 12 Citations

Autonomic State Management for Optimistic Simulation Platforms

Full-text available · Article · Jun 2015 · IEEE Transactions on Parallel and Distributed Systems

Alessandro Pellegrini Roberto Vitali Francesco Quaglia

[Read full-text](#)

0 Comments 10 Citations

Taming Wild Horses: The Need for Virtual Time-Based Scheduling of VMs in Network Simulations

Article · Aug 2012

Srikanth B Yoginath Kalyan S Perumalla

[Request full-text](#)

0 Comments 6 Citations

Performance of time warp under synthetic workloads

[Request full-text](#)

0 Comments 250 Citations

The Dark Side of Risk (What your mother never told you about Time Warp)

Full-text available · Article · Feb 1970 · ACM SIGSIM Simulation Digest

David M. Nicol Xiaowen Liu

[Read full-text](#)

0 Comments 36 Citations

Calendar queues: A fast O(1) priority queue implementation for the simulation event set problem

Article · Oct 1988 · Communications of the ACM

Randy Brown

[Request full-text](#)

0 Comments 352 Citations

Synchronization Methods in Parallel and Distributed Discrete-Event Simulation

Full-text available · Article · Jan 2013 · Simulation Modelling Practice and Theory

Shafagh Jafer Qi Liu Gabriel Wainer

[Read full-text](#)

0 Comments 24 Citations

Extreme scale computing: Modeling the impact of system noise in multi-core clustered systems

Conference Paper · Jan 2010

Seetharami Seelam Liana L. Fong Asser N. Tantawi +2 more authors... Kevin Gildea

[Request full-text](#)

0 Comments 18 Citations

Distributed Simulation and the Time Warp Operating System.

Full-text available · Conference Paper · Nov 1987

David R. Jefferson Brian Beckman Frederick Wieland +9 more authors... Steve Bellenot

[Read full-text](#)

0 Comments 173 Citations

Characterizing application sensitivity to OS interference using kernel-level noise injection

Full-text available · Conference Paper · Nov 2008

Kurt B. Ferreira Patrick G. Bridges Ron Brightwell

[Read full-text](#)

0 Comments 120 Citations

Virtual Time.

Full-text available · Article · Jul 1985 · ACM Transactions on Programming Languages and Systems



0 Comments 1008 Citations

Efficient Execution of Time Warp Programs on Heterogeneous, NOW Platforms.

Article · Mar 2000 · IEEE Transactions on Parallel and Distributed Systems

Christopher D. Carothers Richard M. Fujimoto

[Request full-text](#)

0 Comments 41 Citations

Software Supports for Event Preemptive Rollback in Optimistic Parallel Simulation on Myrinet Clusters.

Article · Dec 2005 · Journal of Interconnection Networks

Andrea Santoro Francesco Quaglia

[Request full-text](#)

0 Comments 5 Citations

On the processor scheduling problem in time warp synchronization

Full-text available · Article · Jul 2002 · ACM Transactions on Modeling and Computer Simulation

Francesco Quaglia Vittorio Cortellessa

[Read full-text](#)

0 Comments 11 Citations

Optimal Power Control in Interference Limited Fading Wireless Channels with Outage Probability Specifications

Article · Jan 2002 · IEEE Transactions on Wireless Communications

Sunil Kandukuri Stephen Boyd

[Request full-text](#)

0 Comments 466 Citations

Parallel Discrete Event Simulation

Article · Jan 1989 · Communications of the ACM

Richard M. Fujimoto

[Request full-text](#)

0 Comments 1301 Citations

Identifying Sources of Operating System Jitter Through Fine-Grained Kernel Instrumentation

Full-text available · Conference Paper · Oct 2007

Pradipta De Ravi Kothari Vijay Mann

[Read full-text](#)

0 Comments 31 Citations

DyMeLoR: Dynamic Memory Logger and Restorer Library for Optimistic Simulation Objects with Generic Memory Layout

Conference Paper · Jul 2008

[Recommend](#)[Request full-text](#)

0 Comments 24 Citations

On learning algorithms and balancing loads in Time Warp

Conference Paper · Feb 1999

Myongsu Choe Carl Tropper

[Request full-text](#)

0 Comments 33 Citations

Automatic Incremental State Saving

Conference Paper · Feb 1996

D. West K. Panesar

[Request full-text](#)

0 Comments 59 Citations

The dark side of risk (what your mother never told you about TimeWarp)

Conference Paper · Jul 1997

D.M. Nicol X. Liu

[Request full-text](#)

0 Comments 15 Citations

On process migration and load balancing in Time Warp

Article · Apr 1993 · IEEE Transactions on Parallel and Distributed Systems

David W. Glazer Carl Tropper

[Request full-text](#)

0 Comments 116 Citations

Gtw: A Time Warp System For Shared Memory Multiprocessors

Full-text available · Article · Oct 1998

Samir Das Richard Fujimoto Kiran Panesar +1 more author... Maria Hybinette

[Read full-text](#)

0 Comments 202 Citations

Analysis of Bounded Time Warp and Comparison with YAWNS

Full-text available · Article · Jan 1997 · ACM Transactions on Modeling and Computer Simulation

Phillip M. Dickens David M. Nicol Paul F. Reynolds +3 more authors... Name J. M. Duva

[Read full-text](#)

0 Comments 25 Citations

ROOT-Sim: The ROme OpTimistic Simulator—v 1.0. Retrieved from [http](#). Group Hpdc Research.

Processor scheduling for Time Warp parallel simulation. Y.-B Lin, E D Lazowska.