

**2010 Ninth International Workshop on  
Parallel and Distributed Methods in  
Verification, and Second International  
Workshop on High Performance  
Computational Systems Biology**

**(PDMC-HiBi 2010)**

**Enschede, Netherlands  
30 September – 1 October 2010**



**IEEE Catalog Number: CFP1085H-PRT  
ISBN: 978-1-4244-8753-0**

# 2010 Ninth International Workshop on Parallel and Distributed Methods in Verification/2010 Second International Workshop on High Performance Computational Systems Biology

## *PDMC-HiBi 2010*

# Table of Contents

<b>Preface</b> .....	vii
<b>PDMC 2010 Workshop Organization</b> .....	ix
<b>HiBi 2010 Workshop Organization</b> .....	x

---

### **Ninth International Workshop on Parallel and Distributed Methods in Verification (PDMC 2010)**

Invited Paper Abstract (PDMC 2010) .....	3
<i>Youssef Hamadi</i>	
DiVinE: Parallel Distributed Model Checker .....	4
<i>Jirí Barnat, Luboš Brim, Milan Češka, and Petr Rockai</i>	
A General Lock-Free Algorithm for Parallel State Space Construction .....	8
<i>Rodrigo T. Saad, Silvano Dal Zilio, and Bernard Berthomieu</i>	
GPU-PRISM: An Extension of PRISM for General Purpose Graphics Processing Units .....	17
<i>Dragan Bošnjacki, Stefan Edelkamp, Damian Sulewski, and Anton Wijs</i>	
Three High Performance Architectures in the Parallel APMC Boat .....	20
<i>Khaled Hamidouche, Alexandre Borghi, Pierre Esterie, Joel Falcou, and Sylvain Peyronnet</i>	
Industrial Strength Distributed Explicit State Model Checking .....	28
<i>Brad Bingham, Jesse Bingham, Flavio M. de Paula, John Erickson, Gaurav Singh, and Mark Reitblatt</i>	

A BSP Algorithm for the State Space Construction of Security Protocols .....	37
<i>Frédéric Gava, Michaël Guedj, and Franck Pommereau</i>	
<b>Second International Workshop on High Performance Computational Systems Biology (HiBi 2010)</b>	
Invited Paper Abstract (HiBi 2010) .....	47
<i>Peter Schuster</i>	
Implementation of Smith-Waterman Algorithm in OpenCL for GPUs .....	48
<i>Dzmitry Razmyslovich, Guillermo Marcus, Markus Gipp, Marc Zapatka, and Andreas Szillus</i>	
Enhancing the Scalability of Simulations by Embracing Multiple Levels of Parallelization .....	57
<i>Jan Himmelspach, Roland Ewald, Stefan Leye, and Adelinde M. Uhrmacher</i>	
Parallel Particle-Based Reaction Diffusion: A GPU Implementation .....	67
<i>Lorenzo Dematté</i>	
Using the GPU and Multi-core CPU to Generate a 3D Oviduct through Feature Extraction from Histology Slides .....	78
<i>Mark Burkitt, Dawn Walker, Daniela M. Romano, and Alireza Fazeli</i>	
Parallel Computing Algorithms for Reverse-Engineering and Analysis of Genome-Wide Gene Regulatory Networks from Gene Expression Profiles.....	88
<i>Vincenzo Belcastro, Diego di Bernardo, Francesco Gregoretti, and Gennaro Oliva</i>	
Parameter Scanning by Parallel Model Checking with Applications in Systems Biology .....	95
<i>Jirí Barnat, Luboš Brim, David Šafránek, and Martin Vejnár</i>	
Predicting the Effects of Parameters Changes in Stochastic Models through Parallel Synthetic Experiments and Multivariate Analysis .....	105
<i>Michele Forlin, Tommaso Mazza, and Davide Prandi</i>	
Fast Parallel Markov Clustering in Bioinformatics Using Massively Parallel Graphics Processing Unit Computing .....	116
<i>Alhadi Bustamam, Kevin Burrage, and Nicholas A. Hamilton</i>	
HMMlib: A C++ Library for General Hidden Markov Models Exploiting Modern CPUs .....	126
<i>Andreas Sand, Christian N.S. Pedersen, Thomas Mailund, and Asbjørn Tølbøl Brask</i>	
<b>Author Index</b> .....	135