Institute of Physics Publishing

International Workshop on Statistical-Mechanical Informatics 2007

IW-SMI 2007

Journal of Physics: Conference Series Vol. 95

September 16-19, 2007
Kyoto, Japan

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60560-248-6

Some format issues inherent in the e-media version may also appear in this print version.

Copyright (2007) by the Institute of Physics Publishing.

All rights reserved.

For permission requests, please contact the Institute of Physics Publishing at the address below.

Institute of Physics Publishing
Dirac House, Temple Back
Bristol BS1 6BE UK

Tel +44 (0)117 929 7481
Fax +44 (0)117 929 4318

Institute of Physics Publishing

International Workshop on Statistical-Mechanical Informatics
2007

TABLE OF CONTENTS

Inference from Correlated Patterns: a Unified Theory for Perceptron Learning and Linear Vector Channels 1
Y Kabashima

Asymptotics of Harish-Chandra-Itzykson-Zuber Integrals and Free Probability Theory 14
T Tanaka

Some Recent Results Concerning Phase Transitions in Spin Glasses 23
A P Young

Spin Glasses and Algorithm Benchmarks: a One-dimensional View 32
H G Katzgraber

A Monte Carlo Algorithm for Sampling Rare Events: Application to a Search for the Griffiths Singularity 42
K Hukushima, Y Iba

A Quadratic Programming Problem Arising from Vector Precoding in Wireless Communications 52
R R Müller, D Guo, A L Moustakas

Some Large Linear Systems in Communications: Estimation, Information and Statistical Physics 61
D Guo

Statistical-mechanics-based Analysis of Multiuser MIMO Channels with Linear Dispersion Codes 71
K Takeuchi, T Tanaka

Interior Point Decoding for Linear Vector Channels 82
T Wadayama

Statistical Mechanics of Sensing and Communications: Insights and Techniques 92
T Murayama, P Davis

Solution-space Structure of (some) Optimization Problems 107
A K Hartmann, A Mann, W Radenbach

Phase Transitions and Computational Difficulty in Random Constraint Satisfaction Problems 117
F Krząkała, L Zdeborová

Relationship Between Clustering and Algorithmic Phase Transitions in the Random K-XORSAT Model and Its NP-complete Extensions 127
F Altarelli, R Monasson, F Zamponi

Cycles in Sparse Random Graphs 143
E Marinari, V V Kerrebroeck

Deterministic Annealing Variant of Variational Bayes Method 153
K Katahira, K Watanabe, M Okada

Gene-network Inference by Message Passing 162
A Braunstein, A Pagnani, M Weigt, R Zecchina

The Space of Feasible Solutions in Metabolic Networks 173
A Braunstein, R Mulet, A Pagnani

Combining Multiple Decisions: Applications to Bioinformatics 183
N Yukinawa, T Takenouchi, S Oba, S Ishii

Statistical Physics of Group Testing 196
M Mézard, M Tarzia, C Toninelli

Optimization and Thermodynamics of Classical Problems from a Quantum Perspective 206
R D Somma, C D Batista, G Ortiz

Mathematical Aspects of Quantum Annealing 214
H Nishimori, S Morita

Quantum Cryptography and Quantification of Quantum Correlations 225
M Koashi

A Quantum-statistical-mechanical Extension of Gaussian Mixture Model 235
K Tanaka, K Tsuda

Author Index