Erik Hörmann

I am currently studying Applied Mathematics at *La Sapienza* University, and I hold a MSc in Theoretical Physics from the same university.

My main field of interest lies at the confluence of methods from statistical mechanics and computer science, primarily in the applications to networked and complex systems.

My work includes various experiences with Monte Carlo algorithms, belief propagtion, analysis of complex energy landscapes and optical methods for high performance computation in such areas.

SCIENTIFIC EXPERIENCE

Oct 2019 – Today
MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS
Intelligent Control group
Intern student

Statistical Mechanics for inference and optimal control
Kernel methods in RKHS

Feb 2017 – Today
ISTITUTO ITALIANO DI TECNOLOGIA (IIT)
Center for Nanolife Sciences: CNLS@Sapienza
Trainee researcher

Optical computations for optimization
Markov Chain Monte Carlo algorithms on complex systems
Statistical Mechanics and Condensed Matter physics
Experimental physics: Photonics

Dec 2018 – Today
INTERNATIONAL ASSOCIATION OF PHYSICS STUDENTS
jIAPS: Journal of IAPS
Editor

Member of the editorial board of the journal
Correction and evaluation of submitted articles
Responsible for social media channels of the journal

Aug 2018
ROSKILDE UNIVERSITY
Department of Science and Environment
Summer intern

High performance computing
Advanced algorithms for MC methods: threshold algorithm
GPGPU computing on GPU cluster

Sep 2014 – Oct 2016
LA SAPIENZA, UNIVERSITY OF ROME
Department of Physics
Excellence program: 3 distinct projects, one per semester

Data sequence analysis: human DNA correlation
Ising model simulation with multi spin coding and PThread
Study of Hopfield Neural networks attractors

Jul 2013 – Sep 2013
ELETTRA, SINCROTRONE TRIESTE
SuperESCA beamline
Summer undergraduate program

Condensed Matter Physics and Physics of Interfaces
High-resolution core-level photoemission spectroscopy (HR-XPS)
Data analysis with R

CONTACT DETAILS

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www.erikhormann.eu

LinkedIn:
www.linkedin.com/in/erikhörmann

EXPERTISE

Statistical Physics:

Statistical mechanics
4+ years

Complex systems
3+ years

Spin Glass Theory
2 years

Dynamical Systems
3+ semesters

Ergodic theory
3+ semesters

Statistical Field Theory
2 semesters

Methods and Algorithms:

Markov Chain Monte Carlo methods
3+ years

Complex Energy Landscape Analysis
3+ years

Principal Components Analysis
2 years

Krylov Metods
1 year

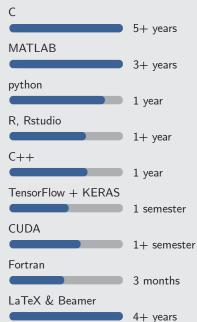Simulated Annealing methods
1 year

Statistical learning
1 year

Belief Propagation methods
1 semester

IT SKILLS

Scientific and programming:

C
5+ years

MATLAB
3+ years

python
1 year

R, Rstudio
1+ year

C++
1 year

TensorFlow + KERAS
1 semester

CUDA
1+ semester

Fortran
3 months

LaTeX & Beamer
4+ years

General purpose:

- Unix, bash, git
- CSS, HTML, Wordpress
- SQL, MySQL
- MS Office, Apple iWork
- Adobe CS

LANGUAGES

Italian:	mother tongue
English:	C2 CEFR [Cambridge ESOL CPE]
German:	B1 CEFR [Sprachzentrum C-Test]

MEMBERSHIPS

2017-today: *Società Italiana di Fisica* Italian Physical Society

2017-today: *European Physical Society*

2014-today: *International Association of Physics Students*

OTHER INTERESTS

- Opera and Classical Music
- Popular Science
- Table games
- Swimming

EDUCATION

Oct 2018 — Today
LA SAPIENZA, UNIVERSITY OF ROME
Master of Science in Applied Mathematics
Major in Algorithm Theory and Combinatorics
Grades avg: 29.80/30 [updated November 2019]
Supervisor: prof. Elena Agliari

Oct 2016 — Oct 2018
LA SAPIENZA, UNIVERSITY OF ROME
Master of Science in Theoretical Physics
Major in Statistical Mechanics and Complex Systems
Final grade: 110/110 *summa cum laude*
Grade avg: 29.70/30
Supervisor: prof. Giancarlo Ruocco
Thesis title: Optical Spin Glass: a new model for galssy systems

Sep 2017 — Mar 2018
HUMBOLTD UNIVERSITÄT ZU BERLIN
ERASMUS semester
Grade avg: 1.0
Supervisor: prof. Dirk Kreimer

Oct 2013 — Oct 2016
LA SAPIENZA, UNIVERSITY OF ROME
Bachelor of Science in Physics
Final grade: 110/110 *summa cum laude*
Grade avg: 28.42/30
Supervisor: prof. Giancarlo Ruocco
Thesis title: Dyadic Matrices and Neural Networks

CONFERENCES & PUBLICATIONS

Jun 2018
Viscous liquids and the glass transition XV, Holbæk (DK)
Poster: Optical Computing for Complex Systems

Nov 2019
PNAS: Proceedings of the National Academy of Science USA
Article: Optical computation of a spin glass dynamics with tunable complexity [paper under submission]

AWARDS AND GRANTS

Aug 2019
Grant for international specialization
Department of Mathematics, *La Sapienza* University of Rome
Awarded on a competitive basis, only one per year: EUR 2,821

Sep 2013 — Sep 2018
Full residential scholarship
Lamaro Pozzani University College, Rome
Awarded to 14 students per year in Italy
Full coverage of living expenses [approx. EUR 10,000 yearly]
Renewed yearly under evaluation of academic performance

Sep 2017
Grant for International Students
Sorgente Group Foundation, Rome
Grant for study and research experiences abroad: EUR 3,000

Sep 2014 — Jul 2016
Excellence Program
Department of Physics, *La Sapienza* University of Rome
Honor assigned on a competitive basis
Full financial coverage for tuition fees throughout the degree

May 2013
Silver medal at Italian National Mathematical Olympiad