Dr. Raoul Malm
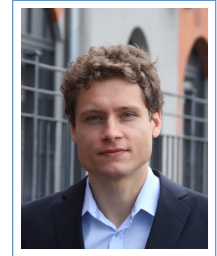
German citizenship

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since 10/2017	- Self-teaching Machine/Deep/Reinforcement Learning and Computer Vision by taking Coursera courses, studying scientific books[1] and research papers, and writing source code.
01/2017 - 09/2017 (Sabbatical)	- Travelling in Nepal, Myanmar, Thailand, Hong Kong, China and Japan - Trekking to the Everest Base Camp in Nepal, climbing Mont Blanc in France, running the Zugspitze trail-marathon near Munich and the city marathons in Cologne and Frankfurt

Education

08/2012 - 11/2016	**Dr. rer. nat. in Theoretical Physics with Distinction, Grade: 0.7 (summa cum laude)** Johannes Gutenberg-University Mainz Thesis: "Five-dimensional Perspective on Higgs Physics and the $b \to s\gamma$ Transition in a Warped Extra Dimension" (d-nb.info/1120148685/34) Supervisor: Prof. Dr. Matthias Neubert
04/2006 - 05/2012	**Dipl.-Phys. in Theoretical Physics, Grade: 1.0 (very good)** Johannes Gutenberg-University Mainz Thesis: "Mitigation of the ϵ_K Fine-tuning Problem in the Randall-Sundrum Model" Supervisor: Prof. Dr. Matthias Neubert
08/1996 - 03/2005	**Secondary School (Abitur), Grade: 1.6 (good)** "Gymnasium am Kurfürstlichen Schloss" in Mainz

Awards

05/2017	Prize for excellent doctoral thesis given by "Friends of Mainz University"
05/2013 - 05/2015	Junior membership of the Gutenberg Academy, Johannes Gutenberg-University Mainz
08/2012 - 08/2014	Fellowship through the Graduate School "Symmetry Breaking in Fundamental Interactions" (DFG/GRK 1581), Student representative from 08/2013 till 08/2014
30/01/2013	Prize for outstanding diploma thesis of the faculty Physics, Mathematics and Computer Science, Johannes Gutenberg-University Mainz
02/2004	First place in "Jugend forscht" (German youth science competition) at the regional level C++ project: "Speech Recognition: Realisation and Application"

Programming Languages

Python, TensorFlow, C++, Mathematica, LaTeX

Software Projects

2018	Nuclei segmentation of microscopic images (2018 Data Science Bowl) by coding a U-Net shaped 10-layer CNN in Python using TensorFlow and OpenCV, where the main computation is performed on a Nvidia GPU in the Google cloud, see my github page. I finished the kaggle contest in the top 14%.
2018	Cancer classification of breast histology images by coding a CNN in Python using TensorFlow and OpenCV. My jupyter notebook won a $500 kernel prize, see my kaggle profile.
2011-2016	Numerical analysis of Higgs and Flavour physics in warped extra dimensions using Mathematica and C++, see my github page.
2004	Basic speech recognition software written in C++ in order to navigate a small vehicle by speaking commands into a microphone, see my homepage.

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[1] I have been studying "Pattern Recognition and Machine Learning" by M. Bishop, "Foundations of Machine Learning" by M. Mohri et. al., "Deep Learning" by I. Goodfellow et. al., "Algorithms for Reinforcement Learning" by C. Szepesvari and "Computer Vision" by R. Szeliski.

Coursera Certificates

2018	"Machine Learning" & "Deep Learning Specialisation", Stanford University
2018	"Neuronal Networks For Machine Learning", University of Toronto
2018	"Genomic Technologies" & "Neuroscience for Neuroimaging", Johns Hopkins University
2018	"Robotics: Perception", University of Pennsylvania
2017	"Bayesian Statistics", University of California, Santa Cruz
2017	"Financial Engineering and Risk Management", Columbia University

Peer-reviewed Scientific Papers

2016	R. Malm, M. Neubert, C. Schmell, JHEP **04**, 042 (2016), arXiv:1509.02539 [hep-ph]
2015	R. Malm, M. Neubert, C. Schmell, JHEP **02**, 008 (2015), arXiv:1408.4456 [hep-ph]
2014	J. Hahn, C. Hörner, R. Malm, M. Neubert, K. Novotny, C. Schmell, Eur. Phys. J. $C74$, 2857 (2014), arXiv:1312.5731 [hep-ph]
2014	R. Malm, M. Neubert, K. Novotny, C. Schmell, JHEP **01**, 173 (2014), arXiv:1303.5702
2012	M. Bauer, R. Malm, and M. Neubert, Phys. Rev. Lett. **108**, 081603 (2012), arXiv:1110.0471

Selection of Talks

2015	"Loop Processes and Higgs Phenomenology in a Warped Extra Dimension", Physics seminar, Ludwig Maximilian University of Munich
2014	"Loop Processes and Higgs Phenomenology in a Warped Extra Dimension", Graduate Summer School, Frauenchiemsee
2013	"5D Perspective on Higgs Production via Gluon Fusion at the Boundary of a Warped Extra Dimension", Graduate School Retreat, Eberbach Abbey, Eltville
2012	"Mitigation of the ϵ_K Fine-tuning Problem in the Randall-Sundrum Model", Graduate School Retreat, Bad Kreuznach
2012	"Neutrinos faster than light? Theoretical aspects", Physics seminar, Johannes Gutenberg-University Mainz

Stays Abroad

06/2014 - 07/2014	Summer school TASI 2014 "Journeys Through the Precision Frontier: Amplitudes for Colliders" at the University of Colorado, Boulder, USA
01/2014 - 02/2014	Winter school "GGI Lectures on the Theory of Fundamental Interactions" at the Galileo Galilei Institute for Theoretical Physics, Florence, Italy
05/2013 - 06/2013	Workshop "Exploring the TeV Scale New Physics with LHC Data" at the Kavli Institute for Theoretical Physics at the University of California, Santa Barbara, USA

Work Experience

2011-2016	Research assistant, Johannes Gutenberg-University Mainz Working group of Prof. Dr. Matthias Neubert Topics: physics beyond the Standard Model, collider physics and phenomenology
2012 - 2014	Academic teaching (Johannes Gutenberg-University Mainz) with advanced tutorials on - Quantum Field Theory and Theoretical Particle Physics - Modern Quantum Field Theory and Introduction to the Standard Model - Higher Quantum Mechanics and Quantum Field Theory
04/2008 - 04/2009	Research assistant as a student, Johannes Gutenberg-University Mainz QUANTUM group of Prof. Dr. Arnold Rauschenbeutel Project: "Construction of an Optical Fiber-based Biosensor"
05/2005 - 01/2006	Civilian service, St. Vincenz and Elisabeth Hospital in Mainz, Germany

Languages	German (native), English (fluent), French (basics)
Personal Interests	AI | Deep Learning, Science | Society, Climbing | Trail Running