

Dr. Niklas Stefan Nolte – Curriculum Vitae

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Date of Birth	12.12.1994	Email	niklas@nolte.dev
Nationality	German & Swedish	StackOverflow	nnohte
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Work experience

- 03/2021-present** Postdoctoral Associate at Massachusetts Institute of Technology (MIT):
- Research and software development for the High Level Trigger (HLT) at the LHCb Experiment at CERN.
 - AI Research for fundamental physics - IAIFI project - Lipschitz networks, monotonicity, robustness
- 11/2017-02/2021** Doctoral thesis at European Organization for Nuclear Research (CERN):
A Selection Framework for LHCb's Upgrade Trigger
Full time research and software development for the HLT and detector upgrade of LHCb planned for 2021.
- Algorithm scheduler used for the HLT processing farm
 - Primary vertex finding algorithm in High performance environment
 - HLT application configuration for the detector upgrade: frontend for O(500) people developing O(1000) reconstruction and selection chains
 - Design & Implementation of an event model together with suitable filter & vertexing algorithms
 - Intra-event signature classification for bandwidth minimization in trigger persistence.
 - Multi-Event-Scheduler for heterogeneous architectures, specifically for GPUs in the HLT.
- 10/2016-09/2017** Master's thesis:
Search for Lepton Flavor Violation in $\phi \rightarrow e^+ \mu^-$ decays
I developed central parts of the analysis, mostly focussing on data classification based on physical/kinematic properties of the final state, Monte-Carlo simulation correction and statistical evaluation of the detector's sensitivity for this decay.
- 04/2015-07/2015** Bachelor's thesis:
Search for Lepton Flavor Violation in $B^+ \rightarrow K^+ e^+ \mu^-$ decays
Together with a colleague I performed initial studies, laying out the ground work for the full analysis PRL123(2019)241802.

Education

11/2017-02/2021	Physics PhD student with specialization on high performance software development and machine learning for physics, supported by the Wolfgang-Gentner-Stipendium at CERN and TU Dortmund University.
10/2018	CERN School of Computing in Israel
10/2015-10/2017	Master of Science in Physics at TU Dortmund University
10/2012-09/2015	Bachelor of Science in Physics at TU Dortmund University
09/2004-06/2012	Abitur at Geschwister-Scholl-Gymnasium Lüdenscheid
Extraordinary	Skipped two school years (2nd and 10th year)

Talks and publications

CHEP Adelaide	2019	<i>Configuration and scheduling of the LHCb trigger application</i> , EPJ, doi:10.1051/epjconf/202024505004
ACAT Saas-Fee	2019	<i>The core software framework for the LHCb Upgrade</i> IOPScience, doi:10.1088/1742-6596/1525/1/012052
DPG Aachen	2019	<i>Scheduling LHCb's upgrade trigger</i>
DPG Würzburg	2018	<i>Search for Lepton Flavor Violation in $\phi \rightarrow e^+ \mu^-$ decays</i>
Additionally		As part of the LHCb research collaboration we publish papers regularly based on the work of many, see the homepage

Training and supervision

04/2021-present	Supervising master student
05/2017-08/2017	Supervised bachelor student
02/2017	training supervisor for the lecture "Statistical Methods of Data Processing"
2010-2017	Private tutor for Physics and Mathematics
since 2008	Volunteer worker for youth/teenager groups at church, summer camps etc.

Skills

Languages

- German (mother tongue)
- English (C2)
- Swedish (A1)

Computing

- Expert level of C++ (mainly STL, BOOST)
- Expert level of python, math, tensor manipulation and automatic differentiation libraries
- Intermediate level of Haskell
- Beginner level of Go
- Everyday usage of git[lab|hub], zsh/bash
- \LaTeX
- UNIX systems

Miscellaneous

- Biking, Running
- Boxing, Bujinkan
- Skiing
- Gaming
- Riddles and Puzzles