

# Patrick Flick

*PhD student in Computational Science, interested in High Performance Computing, Graph Algorithms, String Algorithms, Pattern Matching*

## EDUCATION

- 2014– **Ph.D. in Computational Science & Engineering**,  
*Georgia Institute of Technology.*  
*Current GPA:* 4.0  
*Research:* High Performance Computing, Bioinformatics, String Algorithms  
*Advisor:* Srinivas Aluru
- 2011–2014 **Master's Degree in Computer Science**,  
*Karlsruhe Institute of Technology, Germany.*  
*GPA:* 1.0 (4.0/4.0 equivalent)  
*Specializations:* Algorithm Engineering, Parallel Computing  
*Thesis:* Analysis of human tissue-specific protein-protein interaction networks  
*Minor:* Biology (genetics and molecular biology)
- 2012–2013 **ERASMUS exchange**,  
*Chalmers University of Technology, Sweden.*  
Studied Computer Science, Bioinformatics and Biotechnology
- 2008–2011 **Bachelor's Degree in Computer Science**,  
*Karlsruhe Institute of Technology, Germany.*  
*GPA:* 1.0 (4.0/4.0 equivalent)  
*Thesis:* Parallel sorting as malleable job  
*Minor:* Physics

## AWARDS & SCHOLARSHIPS

- 2016 **Reproducibility Award.**  
*Awarded by:* Supercomputing 2016
- 2015 **Best Student Paper.**  
*Awarded by:* Supercomputing 2015
- 2012 **Deutschlandstipendium.**  
*Awarded by:* Karlsruhe Institute of Technology
- 2012 **ERASMUS scholarship.**  
*Awarded by:* Karlsruhe Institute of Technology

## PUBLICATIONS

- 2017 **P. Flick**, S. Aluru. "Parallel Construction of Suffix Trees and the All-Nearest-Smaller-Values Problem". *IPDPS 2017*
- 2016 T. Pan, **P. Flick**, C. Jain, Y. Liu, S. Aluru, "Kmerind: A Flexible Parallel Library for K-mer Indexing of Biological Sequences on Distributed Memory Systems". *ACM BCB*
- 2015 **P. Flick**, S. Aluru. "Parallel Distributed Memory Construction of Suffix and Longest Common Prefix Arrays". *Supercomputing 2015, Best Student Paper*
- 2015 **P. Flick**, C. Jain, T. Pan, S. Aluru. "A Parallel Connectivity Algorithm for de Bruijn Graphs in Metagenomic Applications". *Supercomputing 2015, Reproducibility Award at SC16*
- 2013 **P. Flick**, P. Sanders, J. Speck, "Malleable Sorting". *IEEE 27th International Parallel and Distributed Processing Symposium, 2013*

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## RESEARCH & PROJECTS

- 2014– **Text and Genome Indexing on parallel distributed systems**,  
*Georgia Institute of Technology*.  
Suffix Array, LCP Array, and Suffix Tree construction on parallel distributed memory clusters. Implementation in C++11 and MPI.  
*Advisor:* Srinivas Aluru  
*GitHub:* [github.com/patflick/psac](https://github.com/patflick/psac)
- 2015– **mxx**.  
a C++/C++11 template library for MPI, providing typesafe C++11 bindings for MPI, and implementations for common parallel patterns and algorithms.  
*GitHub:* [github.com/patflick/mxx](https://github.com/patflick/mxx)
- 2013–2014 **Tissue-specific protein interaction networks**,  
*Chalmers University of Technology*.  
Protein expression and its role in celltype specific protein-protein interaction networks.  
*Advisors:* Prof. Dr. Alexandros Stamatakis (*KIT*), Jr.prof. Dr. Henning Meyerhenke (*KIT*),  
Francesco Gatto, PhD, Prof. Jens Nielsen, PhD, dr.tech.  
*GitHub:* [github.com/patflick/tsppi](https://github.com/patflick/tsppi)
- 2011–2012 **Malleable sorting**,  
*Karlsruhe Institute of Technology*.  
Development and implementation of a parallel sorting algorithm that can change the number of working threads during run-time.  
*Advisors:* Prof. Dr. Peter Sanders, Jochen Speck

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## EXPERIENCE

- 05/2016– **Research Intern**,  
08/2016 *Lawrence Berkeley National Laboratory*.  
High Performance Computing for analysis of PacBio long reads.
- 08/2015 **Argonne Training Program for Extreme-Scale Computing**,  
*Argonne National Labs*.  
Two-week training program covering programming methods, languages, and tools for designing, implementing, and executing computational science applications on current high-end computing systems.
- 06/2015– **Performance Applications Engineering Intern**,  
07/2015 *AMD, Sunnyvale*.  
OpenCL GPU programming and parallel algorithms development.  
Programming in OpenCL, C++, node.js, opencl.js
- 04/2010– **Teaching Assistant**,  
07/2010 *Karlsruhe Institute of Technology*.  
TA for the undergraduate class Algorithms I
- 07/2008– **Student Employee**,  
03/2010 *Yello Strom GmbH, Köln*.  
Various programming and data analysis tasks using C#, R, Matlab, SAS and SQL.

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## SKILLS

- Languages **German** (native), **English** (professional proficiency)
- Programming C++ (MPI, OpenMP, PThreads, C++11), C, Python, OpenCL, Java, SQL, C#, Haskell