Patrick Flick

Georgia Institute of Technology
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Ph.D. Candidate in Computational Science. Research interest in high performance and parallel computing, parallel combinatorial and numerical algorithms. Seeking full time employment starting May'19.

Education

2014– **Ph.D. in Computational Science & Engineering**,
Georgia Institute of Technology.
Current GPA: 4.0
Research: High performance computing, parallel string and graph 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
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)
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

2019 **P. Flick**, S. Aluru. "Distributed Enhanced Suffix Arrays: Efficient Algorithms for Construction and Querying". *IPDPS 2019 (under review)*

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

Experience

05/2018–08/2018 **Research Intern**,
Intel Parallel Computing Lab, Santa Clara.
High Performance Parallel Sparse Tensor Factorization

06/2017–08/2017 **Research Intern**,
Facebook AI Research, NYC.
Implementation and performance evaluation of pytorch for AMD's GPUs.

05/2016–08/2016 **Research Intern**,
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.

06/2015–07/2015 **Performance Applications Engineering Intern**,
AMD, Sunnyvale.
OpenCL GPU programming and parallel algorithms development.
Programming in OpenCL, C++, node.js, opencl.js

04/2010–07/2010 **Teaching Assistant**,
Karlsruhe Institute of Technology.
TA for the undergraduate class Algorithms I

07/2008–03/2010 **Student Employee**,
Yello Strom GmbH, Köln.
Various programming and data analysis tasks using C#, R, Matlab, SAS and SQL.

Research & Projects

2014– **Parallel Distributed String Indexing**,
Georgia Institute of Technology.
Suffix Array, LCP Array, and Suffix Tree construction on parallel distributed memory clusters. Implementation in C++11 and MPI.
GitHub: github.com/patflick/psac

2015– **mxx**.
A 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

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

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

Skills and Involvement

Languages **German** (native), **English** (professional proficiency)

Programming C++ (MPI, OpenMP, PThreads, C++11), C, Python, OpenCL, Cuda, SQL

Involvement President of CSE graduate student association (2016-2018)
Vice-President of CoC grad student council (2016-2018)