

Professional Experience

- since Aug. 2017 **Lecturer (Assistant Professor)**, University of Glasgow, UK.
2014–2017 **Postdoctoral Research Associate**, The University of Edinburgh, UK.
2010–2014 **Research Associate**, University of Münster, Germany.

University Education

- 2010–2015 **PhD degree in computer science**, University of Münster, Germany.
Supervisor: Prof. Sergei Gorlatch
Thesis: *Improving Programmability and Performance Portability on Many-Core Processors*
2005–2010 **Diploma degree in computer science with a minor in mathematics**,
(equivalent to a combined MSc and UG degree) University of Münster, Germany.
Thesis: *SkelCL — A Portable Multi-GPU Skeleton Library*

Honours and Achievements

- **Best Paper Award Winner** at ACM **CGO 2018**.
- **HiPEAC Paper Award Winner** for our paper at **ASPLOS 2018**.
- **Most cited papers** at **ICFP 2015**, **CGO 2017**, and **2018**.
- PhD thesis honoured with the highest possible grade **Summa cum laude**
Nominated as one of 34 candidates for the **prize for best dissertation** completed in 2015
in Informatics at a German, Austrian, or Swiss University.

Awarded Grants

- Nvidia GPU Grant Program (2011, 2016, and 2017) in total of approx. £13.500.
- HiPEAC collaboration grants (2016 and 2013) and HPC-Europa2 visitor grant (2012) in total of approx. €15.000.
- Intel Hardware Accelerator Research Program (2016) for privileged access to Intel's upcoming CPU+FPGA hardware.
- Access to Google's Tensor Flow Research Cloud (2019)

Research Community Activities

Program and Artifact Evaluation Committees & Reviewing

- **Program Committee Member** of ACM CGO 2020, 2019, ACM CC 2020, ACM GPCE 2019,, ACM LCTES 2019, 2018, ICPP 2020, HLPP 2019, 2018, 2017, 2016, OMASE Workshop 2019, DHPCC++ Workshop 2019, 2018, and IEEE ScalCom 2016.
- **Artifact Evaluation Committees** of ACM ICFP 2017, ACM CGO 2017, and ACM PACT 2016.

- **External reviewer for journals:** Communications of the ACM, ACM TODS, ACM TACO, ACM Computing Surveys, Science of Computer Programming Journal (Elsevier), The Journal of Supercomputing (Springer), and Software: Practice and Experience (Wiley).
- **External reviewer for conferences:** CC, CGO, Euro-Par, EuroMPI, CCGrid, ParCo, and PaCT.

Organisation Committees

- **Artifact Evaluation Chair** of CGO 2020, 2019, 2018, CC 2020, and LCTES 2019, 2018.
- **Local Organisation Co-Chair** of HiPEAC Computer Systems Week in April 2019, Scottish Programming Language Seminar in March 2018, October 2019, and UK Many-Core Developer Conference UKMAC in May 2016.
- **Web & Publicity Chair** of CC 2018.

Memberships in Research Networks

- **Member** of ACM, the German Informatics Society (GI: Gesellschaft für Informatik), the UK Many-core Research, Innovation and Opportunities Network (**MaRIONet**), the European Network on High Performance and Embedded Architecture and Compilation (**HiPEAC**) (Academic Member), the Glasgow System Section (**GLASS**), the Glasgow Parallelism Group (**GPG**), the Programming Languages at Glasgow (**PLUG**) Group, the Compiler and Architecture Design (**CaRD**) Group at the University of Edinburgh (Visiting Member), and regular participant of the Scottish Programming Language Seminars (**SPLS**).

Local Community Activities

- I am the **research student committee convener** of the School of Computing Science at the University of Glasgow. Overseeing for the academic progression of over 100 PhD students.
- I organise **Upwards**, a seminar series discussing all aspects of research life to facilitate knowledge sharing among academics and providing career advices.
- I co-organised the **Programming Language Research Programme** at the School of Informatics in Edinburgh together with James Cheney, including a seminar series covering a broad range of topics related to programming languages.
- I organised the **Humble C++ Programmer Group**, a group discussing practical programming topics in C++ targeted at PhD students to improve their coding skills.

Supervised PhD Students

Currently Active Students

since 10/2019	Rongxiao Fu Main Supervisor together with Ornela Dardha at the University of Glasgow
since 10/2019	Johannes Lenfers Second Supervisor together with Sergei Gorlatch at the University of Münster
since 09/2019	Martin Lücke Second Supervisor together with Aaron Smith at the University of Edinburgh
since 11/2018	Thomas Koehler Main Supervisor together with Phil Trinder at the University of Glasgow
since 10/2018	Bastian Köpcke Second Supervisor together with Sergei Gorlatch at the University of Münster
since 10/2016	Bastian Hagedorn Second Supervisor together with Sergei Gorlatch at the University of Münster
since 09/2016	Federico Pizzuti Second Supervisor together with Christophe Dubach at the University of Edinburgh
since 09/2015	Larisa Stoltzfus Second Supervisor together with Christophe Dubach at the University of Edinburgh

Graduated Students

2014 - 2019	Toomas Rimmelg Second Supervisor together with Christophe Dubach at the University of Edinburgh
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- 2015 - 2018 Michael Haidl Second Supervisor together with Sergei Gorlatch at the University of Münster
- 2013 - 2017 Juan José Fumero Second Supervisor together with Christophe Dubach at the University of Edinburgh

Research Visits

- 2019 **Hosting of a visiting researcher (2 Month)**, *From the University of Münster, Germany*.
Funded by the HPC-Europa3 project
- 2018 **Hosting of a visiting researcher (2 Month)**, *From the University of Münster, Germany*.
Funded by the HPC-Europa3 project
- 2017 **Hosting of a visiting researcher (2 Month)**, *From the University of Münster, Germany*.
Funded by the HiPEAC Network of Excellence
- 2017 **Hosting of a visiting researcher (2 Month)**, *From the University of Münster, Germany*.
Funded by the EuroLab-4-HPC project
- 2016 **Research Collaboration (3 Month)**, *dividiti Ltd., UK*.
Funded by the HiPEAC Network of Excellence
- 2016 **Hosting of a visiting researcher (2 Month)**, *From the University of Münster, Germany*.
Funded by the EuroLab-4-HPC project
- 2014 **Visiting researcher (3 Month)**, *The University of Edinburgh, UK*.
- 2013 **Visiting researcher (4 Month)**, *The University of Edinburgh, UK*.
Funded by the HiPEAC Network of Excellence
- 2012 **Visiting researcher (3 Month)**, *The University of Edinburgh/EPCC, UK*.
Funded by the HPC-Europa2 project

Publications

In my research communities publications in highly regarded conferences are much higher valued than journal publications. I list – where known to me – the acceptance rate of the conferences and their ranking using the well established CORE 2018 ranking of computer science conferences.

Citation Statistics

Overall citations: 617, h-index: 14, i-index: 19 (from Google Scholar 16th November 2019)

Journal Articles

- 2019** [J1] L. Stoltzfus, B. Hagedorn, **M. Steuwer**, S. Gorlatch, and C. Dubach. “Tiling Optimizations for Stencil Computations Using Rewrite Rules in Lift”. In: *TACO* (2019). SJR Ranking: Q3, CORE 2010 **Ranking: A**, to appear.
- 2014** [J2] M. Steuwer, M. Haidl, S. Breuer, and S. Gorlatch. “High-Level Programming of Stencil Computations on Multi-GPU Systems Using the SkelCL Library”. In: *Parallel Processing Letters* 24.3 (2014). SJR Ranking: Q3, 14 citations on Google Scholar.
- [J3] M. Olejnik, M. Steuwer, J. N. Dybowski, S. Gorlatch, and D. Heider. “gCUP: Rapid GPU-based HIV-1 Coreceptor Usage Prediction for Next-Generation Sequencing”. In: *Bioinformatics* 30.22 (2014). SJR **Ranking: Q1**, 10 citations on Google Scholar.
- [J4] M. Steuwer and S. Gorlatch. “SkelCL: A High-Level Extension of OpenCL for Multi-GPU Systems”. In: *The Journal of Supercomputing* 69.1 (2014). SJR Ranking: Q3, 15 citations on Google Scholar.

- [J5] M. Steuwer, M. Frieze, S. Albers, and S. Gorlatch. "Introducing and Implementing the Allpairs Skeleton for GPU Systems". In: *Int. Journal of Parallel Programming* 42.4 (2014). SJR Ranking: Q3, 11 citations on Google Scholar.
- 2013** [J6] P. Kegel, M. Steuwer, and S. Gorlatch. "dOpenCL: Towards uniform programming of distributed heterogeneous multi-/many-core systems". In: *Journal of Parallel and Distributed Computing* 73.12 (2013). SJR Ranking: Q2, 11 citations on Google Scholar.
- Conference Proceedings**
- 2018** [C1] P. Ginsbach, T. Rimmelg, **M. Steuwer**, B. Bodin, C. Dubach, and M. F. P. O'Boyle. "Automatic matching of legacy code to heterogeneous APIs: An idiomatic approach". In: *Proceedings of the Twenty-Third International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS 2018, Williamsburg, VA, USA, March 24-28, 2018*. CORE 2018 **Ranking: A*, Acceptance Rate 17.5%, HiPEAC Paper Award**. Williamsburg, VA, USA: ACM, 2018.
- [C2] B. Hagedorn, L. Stoltzfus, **M. Steuwer**, S. Gorlatch, and C. Dubach. "High Performance Stencil Code Generation with LIFT". In: *Proceedings of the 2018 International Symposium on Code Generation and Optimization, CGO 2018, Vienna, Austria, February 24-28, 2018*. CORE 2018 **Ranking: A, Acceptance Rate 29%, Best Paper Award Winner, 26 citations** on Google Scholar, **most cited paper of CGO 2018**. Vienna, Austria: ACM, 2018.
- 2017** [C3] B. Hagedorn, **M. Steuwer**, and S. Gorlatch. "A Transformation-Based Approach to Developing High-Performance GPU Programs". In: *Perspectives of System Informatics - 11th International Ershov Informatics Conference, PSI 2017, Moscow, Russia, June 26-29, 2017*. Ed. by A. Voronkov and A. K. Petrenko. CORE 2018 Ranking: B. 2017.
- [C4] J. Fumero, **M. Steuwer**, L. Stadler, and C. Dubach. "Just-In-Time GPU Compilation for Interpreted Languages with Partial Evaluation". In: *Proceedings of the 13th ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments, VEE 2017, Xi'an, China, April 8-9, 2017*. CORE 2018 **Ranking: A**, 18 citations on Google Scholar. Xi'an, China: ACM, 2017.
- [C5] **M. Steuwer**, T. Rimmelg, and C. Dubach. "LIFT: A Functional Data-Parallel IR for High-Performance GPU Code Generation". In: *Proceedings of the 2017 International Symposium on Code Generation and Optimization, CGO 2017, Austin, TX, USA, February 4-8, 2017*. CORE 2018 **Ranking: A, Acceptance Rate 22%, 59 citations** on Google Scholar, **most cited paper of CGO 2017**. Austin, USA: IEEE, 2017.
- 2016** [C6] **M. Steuwer**, T. Rimmelg, and C. Dubach. "Matrix Multiplication Beyond Auto-Tuning: Rewrite-based GPU Code Generation". In: *Proceedings of the 2016 International Conference on Compilers, Architecture, and Synthesis of Embedded Systems, CASES*. CORE 2018 **Ranking: A**, 12 citations on Google Scholar. Pittsburgh, USA, 2016.
- 2015** [C7] **M. Steuwer**, C. Fensch, S. Lindley, and C. Dubach. "Generating Performance Portable Code using Rewrite Rules: From High-Level Functional Expressions to High-Performance OpenCL Code". In: *Proceedings of the 20th ACM SIGPLAN International Conference on Functional Programming, ICFP 2015*. CORE 2018 **Ranking: A*, Acceptance Rate 29%, 87 citations** on Google Scholar, **most cited paper of ICFP 2015**. Vancouver, Canada, 2015.
- [C8] J. J. Fumero, T. Rimmelg, **M. Steuwer**, and C. Dubach. "Runtime Code Generation and Data Management for Heterogeneous Computing in Java". In: *Proceedings of the Principles and Practices of Programming on the Java Platform, PPPJ 2015*. CORE 2018 Ranking: C, 14 citations on Google Scholar. Melbourne, USA, 2015.

- 2014** [C9] S. Gorlatch and M. Steuwer. "Towards High-Level Programming for Systems with Many Cores". In: *Perspectives of Systems Informatics 9th International Andrei Ershov Memorial Conference (PSI 2014)*. CORE 2018 Ranking: B. St. Petersburg, Russia, 2014.
- 2013** [C10] M. Steuwer and S. Gorlatch. "High-Level Programming for Medical Imaging on Multi-GPU Systems using the SkelCL Library". In: *Proc. of the Int. Conference on Computational Science, (ICCS)*. Vol. 18. Procedia Computer Science. CORE 2018 **Ranking: A**. Barcelona, Spain, 2013.
- [C11] M. Steuwer and S. Gorlatch. "SkelCL: Enhancing OpenCL for High-Level Programming of Multi-GPU Systems". In: *Parallel Computing Technologies 2013*. Lecture Notes in Computer Science. **32 citations** on Google Scholar. St. Petersburg, Russia, 2013.
- 2012** [C12] M. Steuwer, P. Kegel, and S. Gorlatch. "A High-Level Programming Approach for Distributed Systems with Accelerators". In: *New Trends in Software Methodologies, Tools and Techniques – Proceedings of the 11th SoMeT'12*. CORE 2018 Ranking: B. 2012.

Workshop Proceedings

- 2019** [W1] B. Köpcke, **M. Steuwer**, and S. Gorlatch. "Generating efficient FFT GPU code with Lift". In: *Proceedings of the 8th ACM SIGPLAN International Workshop on Functional High-Performance and Numerical Computing, FHPNC@ICFP 2019, Berlin, Germany, August 18, 2019*. 2019.
- [W2] F. Pizzuti, **M. Steuwer**, and C. Dubach. "Position-dependent arrays and their application for high performance code generation". In: *Proceedings of the 8th ACM SIGPLAN International Workshop on Functional High-Performance and Numerical Computing, FHPNC@ICFP 2019, Berlin, Germany, August 18, 2019*. 2019.
- [W3] B. Köpcke, **M. Steuwer**, and S. Gorlatch. "Generating Fast FFT Code for GPU from High-Level, Pattern-Based Abstractions". In: *Proceedings of the International Symposium on High-Level Parallel Programming and Applications, HLPP 2019, Linköping, Sweden, July 3–5, 2019*. 2019.
- [W4] M. Kristien, B. Bodin, **M. Steuwer**, and C. Dubach. "High-level synthesis of functional patterns with Lift". In: *Proceedings of the 6th ACM SIGPLAN International Workshop on Libraries, Languages and Compilers for Array Programming, ARRAY@PLDI 2019, Phoenix, AZ, USA, June 22, 2019*. 2019.
- [W5] N. Mogers, A. Smith, D. Vytiniotis, **M. Steuwer**, C. Dubach, and R. Tomioka. "Towards Mapping Lift to Deep Neural Network Accelerators". In: *Proceedings of the Workshop on Emerging Deep Learning Accelerators, EDLA 2019, Valencia, Spain, January 21, 2019*. 2019.
- 2018** [W6] G. Brown, C. D. Bella, M. Haidl, T. Rummelg, R. Reyes, and **M. Steuwer**. "Introducing Parallelism to the Ranges TS". In: *Proceedings of the International Workshop on OpenCL, IWOCCL 2018, Oxford, United Kingdom, May 14–16, 2018*. 2018.
- 2017** [W7] L. Stoltzfus, C. Dubach, **M. Steuwer**, A. Gray, and S. Bilbao. "A Modular Approach to Performance, Portability and Productivity for 3D Wave Models". In: *Proceedings of WOLFHP 2017, the Seventh International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing*. 2017.
- [W8] J. Fumero, **M. Steuwer**, L. Stadler, and C. Dubach. "OpenCL JIT Compilation for Dynamic Programming Languages". In: *Proceedings of the 2017 Workshop on Modern Language Runtimes, Ecosystems, and VMs, MoreVMs@<Programming> 2017, Brussels, Belgium, April 3, 2017*. 2017.

- [W9] M. Haidl, **M. Steuwer**, H. Dirks, T. Hummernbrum, and S. Gorlatch. "Towards Composable GPU Programming: Programming GPUs with Eager Actions and Lazy Views". In: *PMAM'17: Proceedings of the 8th International Workshop on Programming Models and Applications for Multi-cores and Manycores*. Austin, USA: ACM, 2017.
- 2016** [W10] T. Rimmelg, T. Lutz, **M. Steuwer**, and C. Dubach. "Performance Portable GPU Code Generation for Matrix Multiplication". In: *GPGPU'16: Proceedings of the 9th ACM Workshop on General Purpose Processing using GPUs*. 18 citations on Google Scholar. Barcelona, Spain, 2016.
- [W11] M. Haidl, **M. Steuwer**, T. Humernbrum, and S. Gorlatch. "Multi-Stage Programming for GPUs in Modern C++ using PACXX". In: *GPGPU'16: Proceedings of the 9th ACM Workshop on General Purpose Processing using GPUs*. Barcelona, Spain, 2016.
- [W12] A. Harries, **M. Steuwer**, M. Cole, A. Gray, and C. Dubach. "Compositional Compilation for Sparse, Irregular Data Parallelism". In: *HLPGPGPU'16: Workshop on High-Level Prog. for Heterogeneous and Hierarchical Parallel Systems*. Prague, Czech Republic, 2016.
- [W13] C. Cummins, P. Petoumenos, **M. Steuwer**, and H. Leather. "Towards Collaborative Performance Tuning of Algorithmic Skeletons". In: *HLPGPGPU'16: Workshop on High-Level Prog. for Heterogeneous and Hierarchical Parallel Systems*. Prague, Czech Republic, 2016.
- [W14] C. Cummins, P. Petoumenos, **M. Steuwer**, and H. Leather. "Autotuning OpenCL Workgroup Size for Stencil Patterns". In: *ADAPT'16: Proceedings of the 2016 International Workshop on Adaptive Self-tuning Computing Systems*. 18 citations on Google Scholar. Prague, Czech Republic, 2016.
- 2014** [W15] J. J. Fumero, M. Steuwer, and C. Dubach. "A Composable Array Function Interface for Heterogeneous Computing in Java". In: *ARRAY'14: Proceedings of the 2014 ACM SIGPLAN International Workshop on Libraries, Languages, and Compilers for Array Programming*. 20 citations on Google Scholar. Edinburgh, Scotland, 2014.
- [W16] S. Breuer, M. Steuwer, and S. Gorlatch. "Extending the SkelCL Skeleton Library for Stencil Computations on Multi-GPU Systems". In: *Proceedings of the 1st International Workshop on High-Performance Stencil Computations*. 13 citations on Google Scholar. Vienna, Austria, 2014.
- 2012** [W17] M. Steuwer, P. Kegel, and S. Gorlatch. "Towards High-Level Programming of Multi-GPU Systems Using the SkelCL Library". In: *IEEE International Symposium on Parallel and Distributed Processing Workshops*. 18 citations on Google Scholar. 2012.
- [W18] M. Steuwer, S. Gorlatch, M. Buß, and S. Breuer. "Using the SkelCL Library for High-Level GPU Programming of 2D Applications". In: *Euro-Par 2012: Parallel Processing Workshops*. Lecture Notes in Computer Science. Rhodes Island, Greece, 2012.
- [W19] P. Kegel, M. Steuwer, and S. Gorlatch. "dOpenCL: Towards a Uniform Programming Approach for Distributed Heterogeneous Multi-/Many-Core Systems". In: *IEEE International Symposium on Parallel and Distributed Processing Workshops*. **38 citations** on Google Scholar. 2012.
- 2011** [W20] M. Steuwer, P. Kegel, and S. Gorlatch. "SkelCL - A Portable Skeleton Library for High-Level GPU Programming". In: *IEEE International Symposium on Parallel and Distributed Processing Workshops*. **140 citations** on Google Scholar. 2011.

Thesis

- 2015** [T1] **M. Steuwer**. “Improving Programmability and Performance Portability on Many-Core Processors”. Grade: *Summa Cum Laude*, Supervised by Prof. Sergei Gorlatch, **Nominated** for the **prize for best dissertation** awarded by the German Informatics Society. PhD thesis. University of Münster, 2015.

Book Chapter

- 2016** [B1] **M. Steuwer**. “Verbesserung der Programmierbarkeit und Performance-Portabilität von Manycore-Prozessoren (Improving Programmability and Performance Portability on Many-Core Processors)”. In: *Ausgezeichnete Informatikdissertationen 2015 (Distinguished Dissertations in Informatics 2015)*. Ed. by S. Hölldobler. Lecture Notes in Informatics. German Informatics Society, 2016.
- 2014** [B2] C. Kessler, S. Gorlatch, J. Emmyren, U. Dastgeer, M. Steuwer, and P. Kegel. “Skeleton Programming for Portable Many-Core Computing”. In: *Programming Multi-core and Many-core Computing Systems*. Wiley, 2014.
- 2013** [B3] P. Kegel, M. Steuwer, and S. Gorlatch. “Uniform High-Level Programming of Many-Core and Multi-GPU Systems”. In: *Transition of HPC Towards Exascale Computing*. Vol. 24. Advances in Parallel Computing. IOS Press, 2013.

Talks and Presentations

- 09/2019 **Invited Talk:** *ELEVATE: a language to write composable program optimizations*
Google DeepMind, London, UK.
- 02/2019 **Invited Talk:** *Lift: Generating High Performance Code with Rewrite Rules*
Programming Languages and Software Engineering Group, **University of Washington in Seattle**, US.
- 02/2019 **Invited Talk:** *Lift: Generating High Performance Code with Rewrite Rules*
Microsoft Research in Redmond, US.
- 12/2018 Talk: *Implementing lambda calculus in Python and C++*
Programming Languages at Glasgow (PLUG), University of Glasgow, UK.
- 11/2018 Talk: *High-level Features – Low-level Performance: GPU Performance Prediction of Stencils*
System Seminar, University of Glasgow, UK.
- 09/2018 **Invited Talk:** *Generating Performance Portable Code with Lift*
Shonan Meeting No.134: Advances in Heterogeneous Computing from Hardware to Software, Japan.
- 03/2018 **Invited Talk:** *Lift: Code Generation by Rewriting Algorithmic Skeletons*
Dagstuhl Seminar 18111 on Loop Optimizations, Schloss Dagstuhl, Germany.
- 02/2018 **Invited Talk:**
Programming GPUs with Eager Actions and Lazy Views
Compiler and Architecture Design Group Seminar, University of Edinburgh, UK.
- 02/2018 Talk: *The Lift Project: Performance Portable Parallel Code Generation via Rewrite Rules*
Formal Analysis, Theory and Algorithms Seminar, University of Glasgow, UK.
- 11/2017 Talk: *Programming GPUs with Eager Actions and Lazy Views*
System Seminar, University of Glasgow, UK.
- 10/2017 Talk: *The Lift Project: Performance Portable Parallel Code Generation via Rewrite Rules*
System Seminar, University of Glasgow, UK.
- 10/2017 **Invited Talk:** *The Lift Project: Performance Portable Parallel Code Generation via Rewrite Rules*
Microsoft Research Labs in Cambridge, UK.

- 09/2017 **Invited Talk:**
The Lift Project: Performance Portable Parallel Code Generation via Rewrite Rules
University of Hull HPC Symposium 2017 at the University of Hull, UK.
- 07/2017 **Invited Talk:**
The Lift Project: Performance Portable Parallel Code Generation via Rewrite Rules
University of Münster, Germany.
- 06/2017 Talk: *Programming GPUs with Eager Actions and Lazy Views*
Scottish Programming Languages Seminar at the University of the West of Scotland in Paisley, UK.
- 04/2017 Talk: *Programming GPUs with Eager Actions and Lazy Views*
C++ Edinburgh Meetup in Edinburgh, UK.
- 02/2017 Talk: *Lift: A Functional Data-Parallel IR for High-Performance GPU Code Generation*
International Symposium on Code Generation and Optimization (CGO) 2017 in Austin, USA.
- 02/2017 Talk: *Programming GPUs with Eager Actions and Lazy Views*
International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM) 2017 in Austin, USA.
- 12/2016 **Invited Talk:** *The Lift Project: Performance Portable GPU Code Generation via Rewrite Rules*
Computer Laboratory Systems Research Group Seminar, **University of Cambridge**, UK.
- 08/2016 **Invited Talk:**
Structured Parallel Programming — From High-Level Functional Expressions to High-Performance OpenCL Code
Center for Advanced Electornics Dresden, Dresden University of Technology, Germany.
- 05/2016 **Invited Talk:**
Improving Programmability and Performance Portability on Many-Core Processors
Colloquium of candidates nominated for the *prize for best dissertation* awarded by the German Informatics Society, Schloss Dagstuhl, Germany.
- 04/2016 **Invited Talk:** *The lift Project: Performance Portability via Rewrite Rules*
Saarland University, Germany.
- 01/2016 **Invited Talk:** *Performance Portable GPU Code Generation*
Imperial College London, UK.
- 12/2015 Talk: *Functional Programming in C++*
Programming Language Interest Group at Edinburgh University, UK.
- 10/2015 **Invited Talk:** *Generating Performance Portable Code using Rewrite Rules*
Imperial College London, UK.
- 09/2015 Talk: *Generating Performance Portable Code using Rewrite Rules: From High-Level Functional Expressions to High-Performance OpenCL Code*
International Conference on Functional Programming (ICFP) 2015 in Vancouver, Canada.
- 06/2015 Talk: *Generating Performance Portable Code using Rewrite Rules*
Scottish Programming Languages Seminar in St. Andrews, UK.
- 05/2014 **Invited Talk:** *SkelCL: High-Level Programming of Multi-GPU Systems*
Institute for Computational and Applied Mathematics, University of Münster, Germany.
- 05/2014 **Invited Talk:** *SkelCL: High-Level Programming of Multi-GPU Systems*
Workshop on Fast Data Processing on GPUs in Dresden, Germany.
- 01/2014 Talk: *Extending the SkelCL Library for Stencil Computations on Multi-GPU Systems*
HiStencils 2014 workshop in Vienna, Austria.

- 12/2013 **Invited Talk:** *SkelCL: High-Level Programming of Multi-GPU Systems*
Research group on elementary particle physics, University of Wuppertal, Germany.
- 07/2013 Talk: *Introducing and Implementing the Allpairs Skeleton for GPU Systems*
HLPP 2013 workshop in Paris, France.
- 06/2013 Talk: *High-Level Programming for Medical Imaging on Multi-GPU Systems using the SkelCL Library*
ICCS 2013 conference in Barcelona, Spain.
- 08/2012 Talk: *Using the SkelCL Library for High-Level GPU Programming of 2D Applications*
ParaPhrase 2012 workshop held in conjunction with Euro-Par 2012 in Rhodes, Greece.
- 06/2012 Talk: *High-Level Programming for Heterogeneous Systems with Accelerators*
PDESoft 2012 workshop in Münster, Germany.
- 05/2012 Talk: *Towards High-Level Programming of Multi-GPU Systems Using the SkelCL Library*
ASHES 2012 workshop held in conjunction with IPDPS 2012 in Shanghai, China.
- 04/2012 **Invited talk:** *A Skeleton Library for Heterogeneous Multi-/Many-Core Systems*
NAIS workshop in Edinburgh, UK.
- 01/2012 Talk: *Towards a High-Level Approach for Programming Distributed Systems with GPUs*
COST Action IC0805 ("ComplexHPC") meeting in Timisoara, Romania.
- 12/2011 **Invited talk:** *SkelCL — A High-Level Programming Library for GPU Programming*
Jülich Supercomputing Centre (JSC), Germany.
- 05/2011 Talk: *SkelCL — A Portable Skeleton Library for High-Level GPU Programming*
HIPS 2011 workshop held in conjunction with IPDPS 2011 in Anchorage, Alaska, USA.
- 09/2008 **Invited talk:** *Development of an Online Game as a Student Project*
ITSoftTEAM workshop in Chernihiv, Ukraine.

Teaching Experience

As a Lecturer at the University of Glasgow.

- 2019 - 2020
- *Systems Programming*, undergraduate course (Level H/M). About 200 students.
 - *Professional Software Development Team Project*, undergraduate course (Level H/M), together with Tim Storer (Course Coordinator), Craig Macdonald, Iadh Ounis, and Lito Michala. About 200 students.
- 2018 - 2019
- *Systems Programming*, undergraduate course (Level H/M). About 180 students.
 - *Professional Software Development Team Project*, undergraduate course (Level H/M), together with Tim Storer (Course Coordinator), Inah Omoronyia, and Jeff Dalton. About 180 students.
- 2017 - 2018
- *Operating Systems*, undergraduate course (Level H/M), together with Wim Vanderbauwhede. About 80 students.
 - *Professional Software Development Team Project*, undergraduate course (Level H/M), together with Tim Storer (Course Coordinator), Inah Omoronyia, and Joemon Jose. About 160 students.
 - *MSC CS+ Team Project*, topic: *Developing a visual tool for exploring rewriting*. 6 Students.

As a postdoctoral researcher at the University of Edinburgh.

- 2016 - 2017
 - Guest Lecture on *DSLs and rewrite-based optimizations for performance-portable parallel programming* in the *Elements of Programming Languages* course given by James Cheney.
 - Guest Lecture in the *Compiling Techniques* course given by Christophe Dubach.
 - Assistance in the tutorials of the *Compiling Techniques* course given by Christophe Dubach.
 - 2015 - 2016
 - Organiser and Lecturer of the C++ programming course *The Humble C++ Programmer* aiming to improve PhD students coding skills.
 - Guest Lecture on *DSLs and rewrite-based optimizations for performance-portable parallel programming* in the *Elements of Programming Languages* course given by James Cheney.
 - Assistance in the tutorials of the *Compiling Techniques* course given by Christophe Dubach.
 - 2014 - 2015
 - Guest Lecture in the *Compiling Techniques* course given by Christophe Dubach.
- As a research associate at the University of Münster.
- 2013 - 2014
 - Supervised MSc student project: *Design and implementation of a high-level API for programming heterogeneous clusters.*
 - Supervised MSc student project: *High-level programming of online games in future generation networks.*
 - 2012 - 2013
 - Course Design and Lecturer: *Introduction to programming with C and C++.*
 - Teaching assistant: *Multi-core and GPU: Parallel Programming.*
 - Teaching assistant: *Operating Systems.*
 - 2011 - 2012
 - Supervised MSc student project: *High-level programming of heterogeneous systems.*
 - Teaching assistant: *Multi-core and GPU: Parallel Programming.*
 - Teaching assistant: *Technical aspects of cloud computing* seminar.
 - Teaching assistant: *Operating Systems.*
 - 2010 - 2011
 - Supervised UG/MSc student project: *Internet- and GPU-based Cloud Computing.*
 - Course Design and teaching assistant: *Multi-core and GPU: Parallel Programming.*
 - Supervised UG student project: *High-level GPU programming.*

Supervised Undergraduate and Master Students

As a Lecturer at the University of Glasgow.

- 09/2019 Final year project of Xueying Qin on
- 03/2020 *Proving the correctness of rewrite rules in Agda*
- 09/2019 Final year project of Sarah Ashworth on
- 03/2020 *Implementation of pattern-based computations on an FPGA*
- 09/2019 Final year project of Euan Mcgrevey on
- 03/2020 *Optimizing image processing applications by rewriting*
- 09/2019 Final year project of Darius Darulis on
- 03/2020 *Predicting the performance of rewritten program variations*
- 09/2019 Final year project of David Wood on
- 03/2020 *Optimizing the compilation time of the Rust compiler*
- 06/2018 Final year project of Ryan Maloney on
- 09/2019 *UFC Fight Prediction Web App*

- 06/2018 Final year project of Stuart Rawlinson on
- 09/2019 *Scansion: A Poetry Analysis Web Application*
- 06/2018 Final year project of Junjie Shentu on
- 09/2019 *Development of Ordering Application in Restaurants*
- 06/2018 Final year project of Liam James on
- 09/2019 *Developing an Android Food Rating Application for Armature Chefs*
- 09/2018 Final year project of Hansheng Zhang on
- 03/2019 *Multi-Level Parallel Applications with the C++ Parallel STL*
- 09/2018 Final year project of Dimitar Borisov on
- 03/2019 *Exploiting specialised hardware for general purpose computing*
- 09/2017 Final year project of Domantas Jurkus on
- 03/2018 *Computer Vision Applications with the Parallel STL*
- 09/2017 Final year project of Matthew Cornetto on
- 03/2018 *Sorting Algorithms on GPUs*

The following students have been co-supervised with Sergei Gorlatch at the University of Münster.

- 09/2016 MSc thesis of Bastian Hagedorn on
Efficient GPU Code Generation for Stencil Computations via Parallel Patterns
- 07/2014 Bachelor thesis of André Lüers on
Evaluation of the Skeleton Library FastFlow
- 07/2014 Bachelor thesis of Lars Klein on
A Parallel Implementation of the T-CUP Software using the SkelCL Library
- 01/2014 Master thesis of Michael Olejnik on
A GPU-based Classification Framework for HIV Resistance Prediction
- 01/2014 Master thesis of Stefan Breuer on
Extending the SkelCL Library for Stencil Computations
- 11/2013 Diploma thesis of Wadim Hamm on
Development of a Divide & Conquer Skeleton for SkelCL
- 07/2013 Bachelor thesis of Matthias Droste on
Evaluation of the Skeleton Library SkePU
- 06/2013 Bachelor thesis of Kai Kientopf on
Implementation of the Needleman-Wunsch Algorithm and the Breath-First-Search with SkelCL
- 06/2013 Master thesis of Florian Quinkert on
A Model for Predicting Work Distribution in Heterogeneous Systems and its Implementation in SkelCL
- 03/2013 Master thesis of Malte Frieze on
Extending the Skeleton Library SkelCL with a Skeleton for Allpairs Computations
- 03/2013 Bachelor thesis of Sebastian Mißbach on
Implementing the LU-Decomposition and the Mersenne-Twister with the SkelCL Library
- 03/2013 Bachelor thesis of Patrick Schiffler on
Performance Analysis of SkelCL using B+ Tree Traversal and 3D Jacobi Stencil Computation
- 01/2013 Diploma thesis of Markus Blank-Burian on
Simulation and Analysis of Two-Dimensional Turbulences on Parallel Computer Architectures
- 06/2012 Diploma thesis of Matthias Buß on
Adding Multidimensional Data Types to the Multi-GPU Skeleton Library SkelCL

- 09/2011 Bachelor thesis of Michael Olejnik on
Investigating the Use of GPUs for Radix Sort
- 09/2011 Bachelor thesis of Jan Gerd Tenberge on
Extending the SkelCL Library with Iterators
- 08/2011 Bachelor thesis of Stefan Breuer on
Enhancing SkelCL's MapOverlap Skeleton
- 08/2011 Bachelor thesis of Tobias Günnewig on
Developing a Library for Manipulating Source Code of C-based Languages