David B. Black-Schaffer

Education

6/14 **Docent in Computer Science, Uppsala University**

6/08 **Ph.D. in Electrical Engineering, Stanford University**
Thesis: Block Parallel Programming for Real-time Applications on Multi-core Processors
Advisor: William J. Dally

6/02 **M.S. in Electrical Engineering, Stanford University**
Concentration: robotics and vision

5/00 **B.A. in Engineering Science, Dartmouth College**
Cum Laude

Current Employment

12/17- **Professor (Docent), Uppsala University**
Department of Information Technology, Computer Architecture Research Group

Previous Employment

4/14-12/17 **Associate Professor (Senior Lecturer, Docent), Uppsala University**
Department of Information Technology, Computer Architecture Research Group

5/10-4/14 **Assistant Professor (biträdande lektor), Uppsala University**
Department of Information Technology, Computer Architecture Research Group

9/09-5/10 **Postdoctoral Researcher, Uppsala University**
Department of Information Technology
Computationally Demanding Real-Time Applications on Multicore Platforms project

6/08-8/09 **Software Engineer, Apple, Inc.**
Graphics and Imaging Division
Design, implementation, and testing of the OpenCL standard for parallel heterogeneous computation and its first conformant implementation.

2005-2008 **Graduate Researcher, Stanford University**
Concurrent VLSI Architecture Group
Efficient Embedded Computing project for developing efficient embedded architectures and programming systems.

5/01-8/01 **Engineering Intern, Synaptics, Inc.**
Firmware and hardware design of a data acquisition system for protocol analysis.

Other: **8.3 months of parental leave between 2008 and 2012.**

Grants

2016 **European Research Council (ERC), Starting Grant**
Coordination and Composability: The Keys to Efficient Memory System Design (15.4M SEK)

2016 **Swedish Foundation for Strategic Research (SSF), Smart Systems**
Co-PI for "Automated System SpEcific Model-Based LEarning" (29M SEK)

2015 **Wallenberg Academy Fellow**
Intelligent memory systems (5MSEK + 5MSEK university co-funding)

2014 **Swedish Science Council (VR), Young Researcher Project Grant**
Proactive memory systems (3.6MSEK)

2013 **Swedish Foundation for Strategic Research (SSF), Future Research Leaders**

Heterogeneous runtime systems (10MSEK)

2013 **EU FP7 STREP, ADEPT,**
Co-PI for "Addressing Energy in Parallel Technologies" (5MSEK)

2013 **Pedagogical Development Grant (PUMA), Uppsala University**
Spreading flipped classroom teaching outside of the IT department. (99kSEK)

2013 **E-science pedagogical development project, KTH (Royal Institute of Technology)**
Co-PI for developing interactive online course material (7.5MSEK)

2012 **Framework Grant, Swedish Research Council (Vetenskapsrådet)**
Co-PI for "Efficient Modeling of Heterogeneity in the Era of Dark Silicon." (10MSEK)

2012 **Pedagogical Renewal Fund, School of Science and Technology (TUFF), Uppsala University**
Investigating interactive self-assessment questions for online lectures. (68kSEK)

Awards

2018 **Best Paper Award, International Symposium on Parallel and Distributed Processing with Applications (ISPA 2018)**
"Tail-PASS: Resource-based Cache Management for Tiled Graphics Rendering Hardware."
With Germán Ceballos and Erik Hagersten.

2017 **HiPEAC Paper Award, HiPEAC Network of Excellence**
"A Split Cache Hierarchy for Enabling Data-oriented Optimizations."
With Andreas Sembrant and Erik Hagersten.

2016 **Uppsala University Pedagogical Prize**
2016 independent prize for contributions to the integration of digital resources in teaching.

2015 **Best Paper Award, RAPIDO workshop on Rapid Simulation, 2015**
"StatTask: Reuse Distance Analysis for Task-Based Applciations."
With German Ceballos and Erik Hagersten.

2014 **HiPEAC Paper Award, HiPEAC Network of Excellence**
"The Direct-to-Data (D2D) Cache: Navigating the Cache Hierarchy with a Single Lookup."
With Andreas Sembrant and Erik Hagersten.

2013 **HiPEAC Paper Award, HiPEAC Network of Excellence**
"Modeling Performance Variation Due to Cache Sharing."
With Andreas Sandberg, Andreas Sembrant, and Erik Hagersten.

2012 **Pedagogical Prize, Uppsala Engineering and Science Student Union**
For integrating online and in-class teaching in the flipped classroom model.

2011 **Best Paper, International Conference on Parallel Processing (ICPP11)**
"Cache Pirating: Measuring the Curse of the Shared Cache."
With David Eklöv and Erik Hagersten.

2011 **Best Paper, International Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC11)**
"Fast Modeling of Shared Caches in Multicore Systems." With David Eklöv and Erik Hagersten.

2004 **Centennial Teaching Assistant Award, Stanford University**
For developing and teaching the senior capstone electrical engineering course.

2003 **Hugh Hildreth Skilling Award for The Outstanding Teaching Assistant, Stanford University**

Supervision

Grading Committees

9/18 ADR evaluation, University of Luxembourg
4/18 Ph.D., L. Li, Linköping University, Sweden

9/15 Ph.D., A. Bardizbanyan, Chalmers University, Sweden
5/14 Ph.D., J. Wang, Linköping University, Sweden
10/13 Licentiate, A. Bardizbanyan, Chalmers University, Sweden
5/13 Licentiate, A. Pobdobas, KTH, Sweden
4/13 Ph.D., K. Van Craeynest, University of Gent, Belgium
9/12 Ph.D., V. Babka, Charles University, Prague

Doctoral Students

Graduated: Andreas Sembrant (main advisor, Lic. 12/12, Ph.D., 12/16), Konstantinos Koukos (co-advisor, Ph.D. 10/16), Muneeb Khan (co-advisor, Ph.D. 3/16), Andreas Sandberg (co-advisor, Ph.D. 5/14), David Eklöv (co-advisor, Lic. 2/11, Ph.D. 12/12), Germán Ceballos (main advisor, Lic. 10/17, Ph.D., 12/18)

On-going: Ricardo Alves (main advisor), Johan Janzén (main advisor), Gustaf Borgström (main advisor), Mehdi Alipour (main advisor), Muhammad Hassan (main advisor)

Postdocs: Trevor Carlsson (6/16-6/17), Andra Hugo (8/15-8/17), Gregory Vaumourin (2/17-9/18), Rakesh Kumar (8/17-5/19), Mihail Popov (11/17-)

Invited Talks

Umeå University (2019), University of Texas, Austin (2018), Intel, Stockholm (2017), Keynote, Lund University Pedagogical Conference (2015), Örebro University School of Business (2015), Swedish Institute of Computer Science Multicore Day (2015); HiPEAC ADEPT Workshop (2014); Keynote, Swedish Association for Distance Education (2013); Keynote, Swedish Institute of Computer Science Multicore Day (2013); University of Ghent, Dept. of Electronics and Information Systems (2013); Charles University, Prague, Dept. of Distributed and Dependable Systems (2012); Keynote, Swedish Workshop on Multicore Computing (2011); Ericsson Software Research Day (2011)

Program Committees

International Symposium on Computer Architecture (ISCA) 2019; PACT ERC (2019); International Symposium on Memory Magement ERC (ISMM 2018); PACT(2018); ICCD (2017); SBAC-PAD (2017); MICRO ERC (2017); International Symposium on Computer Architecture (ISCA) 2016; International Symposium on Performance Analysis of Systems and Software (ISPASS) 2016; Super Computing Architectures and Networks (SC) 2015; International Symposium on High-Performance Computer Architecture (HPCA) 2015; GPGPU 2014; International Conference on Supercomputing extended review committee (ICS-2014); Computing Frontiers (2014); Programming Issues for Multi-Core Computers (MULTIPROG-2014), Cluster Journal special issue on Unconventional Cluster Architectures and Applications (2013); International Conference on Advanced Parallel Processing Technology (APPT 2013); International Conference on Information Communication Technology (ICT-EurAsia 2013); 6th Workshop on Programming Issues for Heterogeneous Multicores (MULTIPROG-2013); 26th IEEE International Parallel & Distributed Programming Symposium (IPDPS 2011); 7th Annual Workshop on Modeling, Benchmarking and Simulation (MoBS 2011)

Industrial and Academic Networks

2010- **European Network of Excellence on High Performance and Embedded Architecture and Compilation (HiPEAC)**
Member; co-author of the 2011/2012 and 2013/2014 roadmap reports.

2010-2013 **Open European Network for High Performance Computing on Complex Environments**
Swedish representative; program committee member for the 2013 summer school.

2011- **Ericsson**
Two joint MSc theses on implement our Pirating and Bandit technology on their next-generation base stations; invited talk on our research at their Software Research Day in 2011.

Startups

2012- **ScalableLearning.com**
Team leader. Developing tools to support online and in-class active learning. ScalableLearning has been used by over 30,000 high school and university students in Sweden and abroad.

2014-2018 **Green Cache, AB.**
Co-founder. Commercializing research into power-efficient memory systems. 10 US patents. Multiple funded industrial collaboration projects. IP sold to a major international company.

Language Competence

English: native
Swedish: conversant

Teaching

2011- **Instructor, Uppsala University**
- Introduction to Computer Architecture Research (new course, PhD-level, 2014, 2015)
- Parallel programming for performance (new course, MSc-level, 2014)
- Introduction to computer architecture (local, 2011-2018)
- Introduction to computer architecture (distance, 2011-2013)

2010-2014 **Invited lecturer, KTH Summer School on High Performance Computing**
Graphics processor architecture and programming

2004 **Instructor and course developer, Stanford University**
Digital systems design lab

2003 **Instructor, Stanford University**
Advanced logic design lab

Professional Development

2014	M.S.c. Thesis grading course, Uppsala University (0.5 days)
2014	Active Classrooms Seminar, Uppsala University (0.5 days)
2013	Student Survey Course, Uppsala University (0.5 days)
2013	Active Students Course, Uppsala University (3 days)
2013	Ph.D. Advisor Training Course, Uppsala University (3 weeks)
2013	Student Group Dynamics Course, Uppsala University (1 week)
2011	Ph.D. Advisor Training Course (short), Uppsala University (2 days)
2010	Teacher Training Course, Uppsala University (5 weeks)

Popular Press Articles About my Teaching

9/16	J. Svensson. “Lecturing is not the same as teaching.” (Att föreläsa är inte detsamma som att undervisa.) Universen, Vol 4., 2016.
3/16	P-O. Eliasson. “Get started with flipped classroom.” (Kom igång med omvänt klassrum.) Universitetsläraren, nr 2, 2016.
9/14	P-O. Eliasson. “Flipped classrooms produce more effective learning.” (Flippade klassrum ger mer effektiv inlärning.) Universitetsläraren, vol. 9, 2014.
9/14	S. Jansson. “Lectures are best on film.” (Föreläsningar är bäst på film.) Forskning & Framsteg, vol. 8, 2014.
6/14	A. Hulth. “Inspired by MOOCs.” (Inspirerad av Moocs.) Universen, Vol. 3, 2014.

Pedagogical Outreach

1/19	Presentation on active learning, Umeå University
8/18	Presentation on active learning, Medical Science Faculty teaching day, Uppsala University
11/17	Presentation on active learning, Karolinska Institutie, EDolution seminar
11/17	Presentation and workshop on active learning, Gävle University
10/17	Keynote on active learning, EdTech Sweden Conference, Stockholm

8/17	Presentation and workshop on active learning, Uppsala University Medical School, department of Neroscience
8/17	Presentation and workshop on active learning, SLU Education Conference
5/17	Presentation on active learning, Uppsala Technology and Science PhD Student Days
11/16	Presentation on active learning to high school teachers, Ångström Spektrum Lärardagar
11/16	Presentation on active learning, Södertorn University, Department of Science, Environment and Engineering.
4/16	Oragnizer, ScalableLearning User mingle, KTH
6/15	Organizer, ScalableLearning User Group Meeting, Kista, Sweden (40+ attendees)
11/15	Keynote, Lund University pedagogical conference
10/15	Debate panel on digitalization in education, Royal Swedish Academy of Engineering
10/15	Presentation of flipped classroom teaching, Örebro University School of Business
6/15	Organizer, ScalableLearning User Group Meeting, Kista, Sweden (40+ attendees)
6/14	Organizer, ScalableLearning User Group Meeting, Kista, Sweden (40+ attendees)
11/13	Since 2013, over 1.1M total YouTube views of my educational material (lectures and active learning tutorials). Most viewed lecture ("What is virtual memory?") has 170k views.
10/13	Keynote, Swedish Association for Distance Education
10/13	Presentation of flipped classroom teaching, Uppsala University Conference on University Pedagogical Development
9/13	Presentation of flipped classroom teaching, Uppsala University Department of Pedagogical Development
4/13	Presentation of flipped classroom teaching, Uppsala University Division of Science and Technology Pedagogical Conference
5/13	Keynote on Flipped Classroom Teaching, KTH (250 attendees, 11,300+ online views)
9/12-	Teacher workshops on flipped classroom teaching at Uppsala University, KTH, Stockholm University, Chalmers, Gent University (Belgium), HiPEAC Computer Systems Week (Tallinn, Estonia), NTNU (Norway), Darlarna University, Blekinge University, Mälardalen University, Malmö University, Gävle University, Karolinska Institute, Södertorn University
9/12-	Project lead for the design and development of the ScalableLearning platform for improving student interactivity and teacher feedback via flipped classroom teaching.

Academic Outreach

5/15	Presentation of power-efficient research to students, Valsätra School, Uppsala, Sweden
11/13	Invited talk, technical physics students' research symposium
5/13	Invited talk, technical physics students' event week