Karl Palmskog
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Curriculum Vitae

Karl Palmskog

Research Interests

I am interested in techniques and tools for construction of correct and efficient software systems, in particular using proof assistants. I also take a broad interest in programming languages, software engineering, and formal verification.

Education

Feb 2009 - Nov 2014	**Ph.D., Computer Science**, 240 ECTS credits, KTH Royal Institute of Technology, Stockholm, Sweden. Research on distributed systems and programming languages. Chairman of the Ph.D. student council at the School of Computer Science and Communication in 2013.
Aug 2001 - May 2007	**M.Sc., Computer Science and Engineering**, 270 ECTS credits, KTH Royal Institute of Technology, Stockholm, Sweden. Master's project at Ericsson AB: "Verification of the Session Management Protocol".
Mar 2002 - Jan 2003	Military service/training in the Swedish Armed Forces.

Employment

Jan 2018 -	**Research Fellow**, The University of Texas at Austin, TX, USA. Postdoctoral research on software engineering.
Sep 2017 - Jan 2018	**Visiting Scholar**, University of Illinois at Urbana-Champaign, IL, USA. Postdoctoral research on software verification and proof engineering.
Jan 2015 - Aug 2017	**Postdoctoral Research Associate**, University of Illinois at Urbana-Champaign, IL, USA. Postdoctoral research on programming languages.
Nov 2014 - Dec 2014	**Researcher**, KTH Royal Institute of Technology, Stockholm, Sweden. Postdoctoral research on programming languages and distributed systems.
Feb 2014 - Sep 2014	**Research Engineer**, KTH Royal Institute of Technology, Stockholm, Sweden. Research on programming languages and distributed systems.
Feb 2009 - Jan 2014	**Doctoral Student**, KTH Royal Institute of Technology, Stockholm, Sweden. Lecturer, teaching assistant, and lab assistant in several computer science courses.
Feb 2007 - Jan 2009	**Developer**, Jaycut AB, Stockholm, Sweden. Company co-founder and developer of a platform for online video editing. Company sold in 2011 to Research in Motion (now Blackberry).

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Contributions to Software

Blockchain formalization	`https://github.com/certichain/toychain`
Verdi verification framework	`https://github.com/uwplse/verdi`
Verdi Raft consensus protocol	`https://github.com/uwplse/verdi-raft`
Verdi Chord ring protocol	`https://github.com/DistributedComponents`
Verdi tree aggregation protocol	`https://github.com/DistributedComponents`
Cheerios serialization library	`https://github.com/uwplse/cheerios`
Coq plugins for proof analysis	`https://github.com/proofengineering`
iCoq proof selection tool	`http://cozy.ece.utexas.edu/icoq/`
Distributed separation logic	`https://github.com/DistributedComponents/disel`
SerAPI Coq library	`https://github.com/ejgallego/coq-serapi`

See also GitHub profile: `https://github.com/palmskog`

Professional Service

Workshop on FM for Blockchains	Program Committee Member
CAV 2019	External Reviewer
ISSTA 2019	External Reviewer
SCICO	Reviewer 2019
FASE 2019	External Reviewer
ICSE 2019	External Reviewer
POPL 2019	Artifact Eval. Committee Member
ASE 2018	External Reviewer
FM 2018	External Reviewer
TOMACS	Reviewer 2018
QEST 2017	External Reviewer
COORDINATION 2017	External Reviewer
PDP 2017	External Reviewer
QEST 2016	Proceedings Chair
CONCUR 2016	External Reviewer
COORDINATION 2016	External Reviewer
FORTE 2016	External Reviewer
iFM 2016	External Reviewer
SRDS 2015	External Reviewer
COORDINATION 2015	External Reviewer
CPP 2013	External Reviewer

External Funding

"ReCoqtion: Meta-Certified Continuous Program Verification", Research Award from Facebook, joint with Zachary Tatlock, University of Washington (50k USD).

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Publications

[1] Karl Palmskog, Milos Gligoric, Lucas Pena, and Grigore Rosu. Verifying finality for blockchain systems. In *International Workshop on Coq for Programming Languages*, January 2019.

[2] Minas Charalambides, Karl Palmskog, and Gul Agha. Types for progress in actor programs. In *Models, Languages and Tools for Concurrent and Distributed Programming, Essays Dedicated to Rocco De Nicola on the Occasion of His 65th Birthday*, pages to–appear, 2019.

[3] Karl Palmskog, Ahmet Celik, and Milos Gligoric. piCoq: Parallel regression proving for large-scale verification projects. In *International Symposium on Software Testing and Analysis*, pages 344–355, New York, NY, USA, July 2018. ACM.

[4] Ahmet Celik, Karl Palmskog, and Milos Gligoric. A regression proof selection tool for Coq. In *International Conference on Software Engineering, Demo*, pages 117–120, June 2018.

[5] Gul Agha and Karl Palmskog. Transforming threads into actors: Learning concurrency structure from execution traces. In Marten Lohstroh, Patricia Derler, and Marjan Sirjani, editors, *Principles of Modeling: Essays Dedicated to Edward A. Lee on the Occasion of His 60th Birthday*, pages 16–37, Cham, 2018. Springer.

[6] Gul Agha and Karl Palmskog. A survey of statistical model checking. *ACM Trans. Model. Comput. Simul.*, 28(1):6:1–6:39, January 2018.

[7] Gul Agha, Minas Charalambides, Kirill Mechitov, Karl Palmskog, Atul Sandur, and Reza Shiftehfar. Theoretical considerations: Inferring and enforcing use patterns for mobile cloud assurance. In *Assured Cloud Computing*, pages 237–276. John Wiley & Sons, Ltd, July 2018.

[8] Ryan Doenges, James R. Wilcox, Doug Woos, Zachary Tatlock, and Karl Palmskog. Verifying implementations of churn-tolerant distributed systems. In *International Workshop on Coq for Programming Languages*, January 2017.

[9] Ahmet Celik, Karl Palmskog, and Milos Gligoric. iCoq: Regression proof selection for large-scale verification projects. In *Automated Software Engineering*, pages 171–182, November 2017.

[10] Karl Palmskog, Farah Hariri, and Darko Marinov. A case study on executing instrumented code in Java PathFinder. *SIGSOFT Softw. Eng. Notes*, 40(6):1–5, November 2015.

[11] Mads Dam and Karl Palmskog. Location-independent routing in process network overlays. *Service Oriented Computing and Applications*, 9(3):285–309, Sep 2015.

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[12] Karl Palmskog. *Towards Correct and Efficient Program Execution in Decentralized Networks: Programming Languages, Semantics, and Resource Management*. PhD thesis, School of Computer Science and Communication, KTH Royal Institute of Technology, November 2014.

[13] Mads Dam and Karl Palmskog. Location independent routing in process network overlays. In *Parallel, Distributed and Network-Based Processing (PDP), 2014 22nd International Conference on*, pages 715–724. IEEE, Feb 2014.

[14] Karl Palmskog, Mads Dam, Andreas Lundblad, and Ali Jafari. ABS-NET: Fully decentralized runtime adaptation for distributed objects. In Marco Carbone, Ivan Lanese, Alberto Lluch Lafuente, and Ana Sokolova, editors, Proceedings 6th *Interaction and Concurrency Experience,* Florence, Italy, 6th June 2013, volume 131 of *Electronic Proceedings in Theoretical Computer Science*, pages 85–100. Open Publishing Association, 2013.

[15] Mads Dam and Karl Palmskog. Efficient and fully abstract routing of futures in object network overlays. In *Proceedings of the 2013 Workshop on Programming Based on Actors, Agents, and Decentralized Control*, AGERE! '13, pages 49–60, New York, NY, USA, 2013. ACM.

[16] Kristján Valur Jónsson, Karl Palmskog, and Ymir Vigfússon. Secure distributed top-k aggregation. In *Proceedings of IEEE International Conference on Communications (ICC)*, pages 804–809. IEEE, June 2012.

[17] Karl Palmskog, Alberto Gonzalez Prieto, Catalin Meirosu, Rolf Stadler, and Mads Dam. Scalable metadata-directed search in a network of information. In *Proceedings of Future Network & Mobile Summit*, pages 1–8. IEEE, June 2010.

[18] Yuri Ismailov, Karl Palmskog, Micael Widell, Petter Arvidsson, and YaoShuang Wang. Session Layer Resurgence: Towards Mobile, Disconnection- and Delay-Tolerant Communication. In *Proceedings of 4th European Conference on Universal Multiservice Networks*, pages 337–345. IEEE, February 2007.

[19] Karl Palmskog. Verification of the Session Management Protocol. Master's thesis, School of Computer Science and Communication, KTH Royal Institute of Technology, November 2006.

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Recent Presentations

01/19/18	Verifying Finality for Blockchain Systems. Presentation at CoqPL Workshop.
01/09/18	Regression proving with Dependent Types: Theory and Practice. Presentation at Lean Together workshop.
07/18/18	piCoq: Parallel Regression Proving for Large-Scale Verification Projects. Presentation at the International Symposium on Software Testing and Analysis (ISSTA).
06/13/18	An Introduction to Verification of Software Systems. Invited presentation at Klarna AB.
06/12/18	Regression Proving in Large-Scale Verification Projects: Theory and Practice. Invited presentation at KTH Royal Institute of Technology.
05/31/18	A Regression Proof Selection Tool For Coq. Tool demonstration at the International Conference on Software Engineering (ICSE).
10/31/17	iCoq: Regression Proof Selection for Large-Scale Verification Projects. Presentation at the International Conference on Automated Software Engineering (ASE).
10/30/17	Guest lecturer, CS524, The π-Calculus
10/25/17	Guest lecturer, CS524, Concurrent Processes and Bisimulation
10/23/17	Guest lecturer, CS524, Proofs by Induction
3/14/17	Guest lecturer, CS598, Stochastic computing
1/23/17	iCoq: Regression Proof Selection for Large-Scale Coq Projects. Invited presentation at University of Washington Proof Assistant User Group.
9/29/16	Guest lecturer, CS173, Intro to discrete structures: graph colorings
8/25/16	Guest lecturer, CS173, Intro to discrete structures: graph problems
8/23/16	Guest lecturer, CS173, Intro to discrete structures: course overview
11/9/15	A Case Study on Executing Instrumented Code in Java PathFinder. Presentation at Java PathFinder workshop (JPF 2015)
10/30/15	Guest lecturer, CS477, Temporal logic
10/27/15	Hybrid Inference of Semantics for Software Adaptation. Invited presentation at the 2nd Workshop on Software Engineering for Parallel Systems (SEPS 2015).
5/5/15	Guest lecturer, CS421, Logic Programming
5/1/15	Automatic Conversion of Shared-Memory Programs to the Message-Passing Model Using Dynamic Probabilistic Inference. Invited presentation at BBN Technologies.
4/29/15	Network-Oblivious Programmers, Network-Aware Program Execution. Invited presentations at MIT Computer Science and Artificial Intelligence Laboratory.

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Teaching Experience

Graduate student advising	UT Austin		Co-advising of 2 junior PhD students.
Student supervision	UIUC		Co-supervision of 5 undergraduate students and junior PhD students.
Concurrent Programming Languages	UIUC	CS524	Guest lecturer. Development of exercises.
Programming Languages for Next Generation Applications	UIUC	CS598	Guest lecturer.
Discrete Structures	UIUC	CS173	Guest lecturer.
Formal Software Development Methods	UIUC	CS477	Guest lecturer.
Logic for Computer Science	KTH	DD1350	Held recitation classes. Gave lab assistance to students. Corrected written assignments and exams. Developed course material.
Program System Construction Using C++	KTH	DD2387	Held recitation classes. Gave lab assistance to students. Corrected exams. Developed course material.
Software Engineering	KTH	DD2385	Held recitation classes. Gave lab assistance to students. Developed course material.
Network Security	KTH	DD2495	Guest lecturer. Gave lab assistance to students. Developed course material.
Advanced Algorithms	KTH	DD2440	Corrected written assignments. Conducted oral exams.
Algorithms, Data Structures and Complexity	KTH	DD1352	Gave lab assistance to students. Conducted oral exams.
Compiler Construction	KTH	DD2488	Conducted oral exams.
Numerical Methods	KTH	DN1240	Gave lab assistance to students.