Matti Karppa
Maininkitie 1 A 6
02320 Espoo
Finland
+358 44 0499 708
matti.karppa@aalto.fi

Curriculum Vitae

June 30, 2016

Citizenship: Finnish
Date and place of birth: January 10, 1987, Jyväskylä, Finland

Education

Master of Science (Technology), Aalto University, Computer Science, 29.8.2014, Espoo
Major: Computer and Information Science
Minors: Language Technology, Discrete Mathematics
MSc. thesis: Estimating Hand Configurations from Sign Language Videos

Bachelor of Science (Technology), Aalto University, Computer Science, 31.1.2014, Espoo
Major: Computer and Information Science
Minor: Computer Science and Engineering
BSc. thesis: Model-based Hand Tracking Methods and their Applicability to Estimating Hand
                       Configurations in Sign Language Videos, 2011, approved with honors (in Finnish)

Matriculation Examination, Vääksyn Yhteiskoulu, 05/2006

Language skills

Finnish: native
English: excellent (C2)

Research Experience

Postgraduate Researcher, Aalto University School of Science, Department of Computer Science 09/2014–
I am currently working as a doctoral student under Professor Petteri Kaski. The tentative title of my thesis is "Theory and Practice Below the Combinational Barrier". I am doing theoretical computer science research on algorithms. For example, I am trying to find subquadratic algorithms for finding correlated pairs of time series among noise.

Undergraduate Researcher, Aalto University School of Science, Department of Information and Computer Science 06/2010 – 08/2014
I worked in the Content-Based Image Retrieval research group within the CoBaSiL project, an interdisciplinary research project funded by Academy of Finland, where we research computer vision methods for the analysis and automatical annotation of Finnish Sign Language videos. My main task has been the programming of a software toolkit, called *SLMotion*, implemented in C++ using the OpenCV library which was released to the public as free software in May, 2014. Both my theses – Bachelor's and Master's – were done within the project.

Other relevant work experience

System specialist, Finnish Food Safety Authority Evira, 01/2009 – 08/2009, 07/2007 – 08/2008
I worked as a full-time system specialist for the summers of 2008 and 2009, as a part-time system specialist for the spring of 2009, and before that as a civilian serviceman in the IT department. I did user support, administered user accounts and email in Microsoft Windows Server 2003 AD and Microsoft Exchange environments, maintained servers and workstations, installed software, and participated in workstation standardization development.

Research Funding

HICT grant, Helsinki Doctoral Education Network in Information and Communications Technology, 09/2014–08/2018
I was granted four years of funding for pursuing a doctoral degree under the supervision of Professor Petteri Kaski at Aalto University.

Teaching Experience

Head Assistant, Aalto University School of Science, Department of Computer Science 01/2015 – 05/2015
I was the head assistant, in charge of some course organization and gave occasional exercises in the course ICS-A1120 Programming II (Spring 2015).

Teaching Assistant, Aalto University School of Science, Department of Information and Computer Science 09/2013 – 05/2014
I gave exercise sessions on the following courses:
ICS-A1120 Programming II (Spring 2014)
T-61.5100 Digital Image Processing P (Autumn 2013)

Scype – Aalto SCI Pedagogical Training (10 ECTS credits, 9/2014–3/2015)
I completed pedagogical training consisting of two modules: introduction to teaching at Aalto (5 ECTS credits) and Course Planning (5 ECTS credits).

Tools for Teaching Training, Aalto University, October 24, 2013
A one-day long teaching training event aimed at teaching assistants.

IT skills

Programming languages:	C++	Strong, most work experience
	Python	Some work experience
	Matlab	Some work experience
	Scala	Strong basics, some teaching experience
	C	Strong basics
	Java	Strong basics
	Shell scripts	Some BASH experience
	PHP	Little experience
	Windows command line scripts	Basics
Operating systems:	Microsoft Windows	Some IT administrative experience
	GNU/Linux, Mac OS X	Power user
Tools:	Emacs, git, CVS, GCC, CLang, make, CMake, among others	
Miscellaneous:	LaTeX	Strong (publications, coursework)
	HTML/CSS/SQL	Some basics

Publications

Matti Karppa, Petteri Kaski, Jukka Kohonen, and Padraig Ó Catháin. Explicit correlation amplifiers for finding outlier correlations in deterministic subquadratic time. In *Proc. 24th Annual European Symposium on Algorithms (ESA 2016)*, Dagstuhl, Germany, 2016a. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik.

Matti Karppa, Petteri Kaski, and Jukka Kohonen. A faster subquadratic algorithm for finding outlier correlations. In *Proc. 27th Annual ACM-SIAM Symposium on Discrete Algorithms, (SODA)*, pages 1288–1305, Philadelphia, PA, USA, 2016b. Society for Industrial and Applied Mathematics. doi: 10.1137/1.9781611974331.ch90. URL http://dx.doi.org/10.1137/1.9781611974331.ch90.

Ville Viitaniemi, Matti Karppa, and Jorma Laaksonen. 2D appearance based techniques for tracking the signer configuration in sign language video recordings. In *Proceedings of 11th International Conference on Image Analysis and Recognition (ICIAR 2014)*, volume 2, pages 29–38, Berlin, Germany, October 2014a. ISBN 978-3-319-11754-6. doi: 10.1007/978-3-319-11755-3_4. URL http://dx.doi.org/10.1007/978-3-319-11755-3_4.

Ville Viitaniemi, Matti Karppa, and Jorma Laaksonen. Experiments on recognising the handshape in blobs extracted from sign language videos. In *Proceedings of 22nd International Conference on Pattern Recognition (ICPR 2014)*, Los Alamitos, CA, USA, August 2014b. IEEE Computer Society. doi: 10.1109/ICPR.2014.446. URL http://dx.doi.org/10.1109/ICPR.2014.446.

Matti Karppa, Ville Viitaniemi, Marcos Luzardo, Jorma Laaksonen, and Tommi Jantunen. SLMotion – an extensible sign language oriented video analysis tool. In Nicoletta Calzolari (Conference Chair), Khalid Choukri, Thierry Declerck, Hrafn Loftsson, Bente Maegaard, Joseph Mariani, Asuncion Moreno, Jan Odijk, and Stelios Piperidis, editors, *Proceedings of 9th Language Resources and Evaluation Conference (LREC 2014)*, Reykjavík, Iceland, May 2014. European Language Resources Association. ISBN 978-2-9517408-8-4. URL http://www.lrec-conf.org/proceedings/lrec2014/pdf/209_Paper.pdf.

Ville Viitaniemi, Tommi Jantunen, Leena Savolainen, Matti Karppa, and Jorma Laaksonen. S-pot – a benchmark in spotting signs within continuous signing. In Nicoletta Calzolari (Conference Chair), Khalid Choukri, Thierry Declerck, Hrafn Loftsson, Bente Maegaard, Joseph Mariani, Asuncion Moreno, Jan Odijk, and Stelios Piperidis, editors, *Proceedings of 9th Language Resources and Evaluation Conference (LREC 2014)*, Reykjavík, Iceland, May 2014c. European Language Resources Association. ISBN 978-2-9517408-8-4. URL http://www.lrec-conf.org/proceedings/lrec2014/pdf/440_Paper.pdf.

Marcos Luzardo, Ville Viitaniemi, Matti Karppa, Jorma Laaksonen, and Tommi Jantunen. Estimating head pose and state of facial elements for sign language video. In *Proceedings of the 6th Workshop on the Representation and Processing of Sign Languages: Beyond the Manual Channel (LREC 2014)*, Reykjavík, Iceland, May 2014. European Language Resources Association. URL http://www.lrec-conf.org/proceedings/lrec2014/workshops/LREC2014Workshop-SignLanguage%20Proceedings.pdf.

Ville Viitaniemi, Matti Karppa, Jorma Laaksonen, and Tommi Jantunen. Detecting hand-head occlusions in sign language video. In *Proceedings of the 18th Scandinavian Conference on Image Analysis*, volume 7944 of *LNCS*, pages 361–372, Berlin, Germany, June 2013. Springer. doi: 10.1007/978-3-642-38886-6_35. URL http://dx.doi.org/10.1007/978-3-642-38886-6_35.

Marcos Luzardo, Matti Karppa, Jorma Laaksonen, and Tommi Jantunen. Head pose estimation for sign language video. In *Proceedings of the 18th Scandinavian Conference on Image Analysis*, volume 7944 of *LNCS*, pages 349–361, Berlin, Germany, June 2013. Springer. doi: 10.1007/978-3-642-38886-6_34. URL http://dx.doi.org/10.1007/978-3-642-38886-6_34.

Matti Karppa, Tommi Jantunen, Ville Viitaniemi, Jorma Laaksonen, Birgitta Burger, and Danny De Weerdt. Comparing computer vision analysis of signed language video with motion capture recordings. In *Proceedings of 8th Language Resources and Evaluation Conference (LREC 2012)*, pages 2421–2425, Istanbul, Turkey, May 2012. European Language Resources Association. URL http://www.lrec-conf.org/proceedings/lrec2012/pdf/321_Paper.pdf.

Matti Karppa, Tommi Jantunen, Markus Koskela, Jorma Laaksonen, and Ville Viitaniemi. Method for visualisation and analysis of hand and head movements in sign language video. In *Proceedings of the 2nd Gesture and Speech in Interaction conference (GESPIN 2011)*, Bielefeld, Germany, 2011. University of Bielefed. URL `http://coral2.spectrum.uni-bielefeld.de/gespin2011/final/Jantunen.pdf`.