

Kalle Rutanen

Curriculum vitae

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Personal information

Full name Kalle Matias Rutanen
Born 1983
Nationality Finnish

Education

- 2016 **D.Sc. (Tech.) in Mathematics**, *Tampere University of Technology*, Tampere, Finland.
2008 **M.Sc. (Tech.) in Computer Science**, *Tampere University of Technology*, Tampere, Finland.

Publications

- 2016 **Kalle Rutanen**, *O-notation in Algorithm Analysis*, Doctoral Thesis, Tampere University of Technology, Volume 1427, October 2016.
- 2015 **Kalle Rutanen, Germán Gómez-Herrero, Sirkka-Liisa Eriksson, Karen Egiazarian**, *A General Definition of the O-notation for Algorithm Analysis*, Bulletin of EATCS 117, October 2015.
- Gérman Gómez-Herrero, Wei Wu, Kalle Rutanen, Miguel C. Soriano, Gordon Pipa, Raul Vicente**, *Assessing Coupling Dynamics from an Ensemble of Time Series*, Entropy 17, pp. 1958–1970, 2015.
- 2014 **Pekka Ruusuvuori, Lassi Paavolainen, Kalle Rutanen, Anita Mäki, Heikki Huttunen, Varpu Marjomäki**, *Quantitative Analysis of Dynamic Association in Live Biological Fluorescent Samples*, PLoS ONE 9 (4), 2014.
- 2013 **Kalle Rutanen, Germán Gómez-Herrero, Sirkka-Liisa Eriksson, Karen Egiazarian**, *Least-Squares Transformations between Point-Sets*, 18th Scandinavian Conference on Image Analysis, pp. 501–511, June 17–20, 2013.
- 2010 **Gérman Gómez-Herrero, Kalle Rutanen, Karen Egiazarian**, *Blind Source Separation by Entropy Rate Minimization*, Signal Processing Letters, IEEE, Volume 17, Issue 2, pp. 153–156, 2010.
- 2008 **Heikki Huttunen, Pekka Ruusuvuori, Tapio Manninen, Kalle Rutanen, Risto Rönkkä**, *Dynamic Adaptation of Interconnections in Inkjet Printed Electronics*, International Conference on Signals and Electronic Systems (ICSSES), pp. 449–452, 2008.
- Heikki Huttunen, Pekka Ruusuvuori, Tapio Manninen, Kalle Rutanen, Risto Rönkkä, Ari Visa**, *Object Detection for Dynamic Adaptation of Interconnections in Inkjet Printed Electronics*, 15th IEEE Internal Conference on Image Processing (ICIP), pp. 2364–2367, 2008.

Published software

- 2005–2017 **Pastel**, a C++/Matlab library for geometry and computer graphics.
- 2010–2017 **Remark**, a Python library for documenting software libraries in lightweight notation.
- 2009 **TIM**, a C++/Matlab library for estimation of information-theoretic measures from time-series.

Academic visits abroad

- 2014 **Research visit to Netherlands Institute for Neuroscience**, *Amsterdam, Netherlands*.
A 1-month visit to Eus J.W. van Someren's research group on July.
- 2013 **Research visit to Netherlands Institute for Neuroscience**, *Amsterdam, Netherlands*.
A 1.5-month visit to Eus J.W. van Someren's research group on May–June.

Grants

- 2015 **Science Fund of the City of Tampere**.
June – August Three-month summer grant for *Entropy Combinations*.
- 2009–2010 **Finnish Foundation for Technology Promotion**.
One year grant for *Geometric Algebra in Computer Graphics*. (September 2009 – August 2010)

Work experience in research

- 2017– **Researcher**, *Tampere University of Technology, Department of Mathematics*, Tampere, Finland.
Working on the theory of entropy combinations and ASCII-encoding of mathematical symbols. (October 2016 – July 2017)
- 2014–2016 **Researcher**, *Tampere University of Technology, Department of Mathematics*, Tampere, Finland.
Worked on O-notation in Algorithm Analysis; my doctoral thesis. I was funded by working as a teaching assistant. (January 2015 – October 2016)
- 2013–2014 **Researcher**, *Tampere University of Technology, Department of Mathematics*, Tampere, Finland.
Worked on the theory of entropy combinations, and on least-squares transformations. I was funded by the Finnish National Doctoral Programme in Mathematics and its Applications. (January 2013 – December 2014)
- 2010–2011 **Researcher**, *Tampere University of Technology, Department of Signal Processing, Image Analysis Group*, Tampere, Finland.
Worked on the theory of entropy combinations, and participated in the development of BM3D-related noise-reduction algorithms for images and video. (September 2010 – August 2011)
- 2009 **Researcher**, *Tampere University of Technology, Department of Signal Processing, Image Analysis Group*, Tampere, Finland.
April – August Programmed the TIM software for entropy combination estimation in C++ and Matlab.
- 2007–2009 **Research assistant**, *Tampere University of Technology, Department of Signal Processing, Computational Systems Biology Group*, Tampere, Finland.
Developed algorithms for printed electronics. The work was based on image processing in Matlab and C++. (March 2007 – February 2009)

Work experience in teaching

2011–2016 **Teaching assistant**, *Tampere University of Technology, Department of Mathematics*, Tampere, Finland.

For every course, I was responsible for holding weekly exercise groups. I held these exercise groups to fund my doctoral studies.

- MAT-02700 Operations Research (Spring 2016)
- MAT-01310 Engineering Mathematics A3 (Spring 2015, Spring 2016)
- MAT-01220 Engineering Mathematics B2 (Fall 2015)
- MAT-01110 Engineering Mathematics A1 (Fall 2015)
- MAT-02500 Probability Theory (Fall 2015)
- MAT-02650 Mathematics for Algorithms (Spring 2015)
- MAT-61256 Geometric Analysis (Spring 2015)
- MAT-01320 Engineering Mathematics B3 (Spring 2015)
- MAT-10421 Engineering Mathematics A2 (Fall 2011, Fall 2012)
- MAT-10412 Engineering Mathematics B1 (Fall 2011, Fall 2012)
- MAT-20401 Vector Analysis (Fall 2011, Fall 2012)
- MAT-20501 Probability Theory (Spring 2012, Fall 2012)
- MAT-10444 Engineering Mathematics C4 (Spring 2012)
- MAT-53756 Introduction to Geometric Algebra and its Applications (Spring 2012)

Programming and markup languages

Excellent C++
Intermediate Python, MATLAB, HTML, CSS, \LaTeX
Basic Mathematica, JavaScript

Languages

Native Finnish
Excellent English
Basic Swedish

Other activities

- I was a regular contributor to the comp.graphics.algorithms newsgroup during 2002–2012 (pseudonym Kaba).