

Kalle Rutanen

Curriculum vitae

Tampere, FINLAND
☎ +358 40 777 1881
✉ kaba@hilvi.org
🌐 <http://kaba.hilvi.org>



Personal information

Full name Kalle Matias Rutanen
Born 1983
Nationality Finnish

Education

2017 **D.Sc. (Tech.) in Mathematics**, *Tampere University of Technology*, Tampere, Finland.
2008 **M.Sc. (Tech.) in Computer Science**, *Tampere University of Technology*, Tampere, Finland.

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 and funding

2015 **Science Fund of the City of Tampere**.
June – August Three-month grant for *Entropy Combinations*.
2013–2015 **Finnish National Doctoral Programme in Mathematics in its Applications**.
Two-year funding for *Entropy combinations*. (January 2013 – January 2015)
2009–2010 **Finnish Foundation for Technology Promotion**.
One-year grant for *Geometric Algebra in Computer Graphics*. (September 2009 – August 2010)

Work experience in research

2016–2017 **Visiting Researcher**, *Tampere University of Technology, Department of Mathematics*, Tampere, Finland.
Worked on visual ASCII encoding of Unicode symbols, fast regular expression matching, and a writing system for mathematical papers. (November 2016 – Present)

- 2015–2016 **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 least-squares transformations between point-sets. Started working on O-notation in algorithm analysis. Found a new estimator for entropy combinations. I was funded by the Finnish National Doctoral Programme in Mathematics and its Applications. (January 2013 – December 2014)
- 2011–2012 **Researcher**, *Tampere University of Technology, Department of Mathematics*, Tampere, Finland.
Worked on estimation of entropy combinations: reviewed literature, studied mathematical statistics, time series analysis, and dynamical systems. I was funded by working as a teaching assistant. (September 2011 – December 2012)
- 2010–2011 **Researcher**, *Tampere University of Technology, Department of Signal Processing, Image Analysis Group*, Tampere, Finland.
Participated in the development of BM3D-related noise-reduction algorithms for images and video and worked partially on the estimation of entropy combinations. (September 2010 – August 2011)
- 2009–2010 **Researcher**, *TUT/Department of Signal Processing*.
Worked on geometric algebra; mainly studying. I was funded by a grant from the Finnish Foundation for Technology Promotion. (September 2009 – August 2010)
- 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 to assist with Germán Gomez-Herrero's doctoral thesis, which applied transfer entropy and mutual information on neuroscience.
- 2007–2009 **Research assistant**, *Tampere University of Technology, Department of Signal Processing, Computational Systems Biology Group*, Tampere, Finland.
Developed algorithms for printed electronics; automatic correction of circuit-images to match heat-distorted circuits. 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++ (1994→)
Intermediate Python (2010→), MATLAB (2005→), HTML, CSS, \LaTeX
Basic Mathematica, JavaScript

Languages

Native Finnish
Excellent English
Basic Swedish

Other activities

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