

Raazesh Sainudiin – Curriculum Vitae

Links

- CV: <http://lamastex.org/cv.shtml>
- 50 Peer-reviewed Publications: <http://lamastex.org/publications.shtml>
- 74 Invited Talks: <http://lamastex.org/talks.shtml>
- 36 Courses: <http://lamastex.org/courses.shtml>
- GitHub: <https://github.com/raazesh-sainudiin?tab=repositories>
- LinkedIn: <https://www.linkedin.com/in/raazesh-sainudiin-45955845>
- Contact Details: <http://lamastex.org#contact>
Department of Mathematics, Uppsala University
Box 480, 75106 Uppsala, Sweden
Mobile: +46 76-225 85 72
Email: raazesh.sainudiin@gmail.com

Professional Preparation

1. 2005-2007: Research Fellow in Statistics, University of Oxford, UK
2. 2005: Postdoctoral Associate of Mathematics, Cornell University, USA
3. 2005: Ph.D. in Statistics, Cornell University, USA
4. 2003: M.S. in Biometrics, Cornell University, USA
5. 1999: B.S. in Mathematics & Biology, Minnesota State University, USA

Current Appointments

1. 2017 Jan - : Researcher in Applied Mathematics and Statistics, Department of Mathematics, Uppsala University, Uppsala, Sweden
2. 2017 Apr - : Data Science Consultant, Combient AB, Stockholm, Sweden
3. 2016 Sep - : Chief Analytics Officer and Co-founder, WebIntrinsics.io, Christchurch, New Zealand

Past Appointments, Awards and Honors

1. 2016 Nov - Dec: Research Chair in Mathematical Models of Biodiversity held by Veolia Environnement, French National Museum of Natural History, Paris and Centre for Mathematics and its Applications, Ecole Polytechnique, Palaiseau, France
2. 2012 - 2016: Senior Lecturer, School of Mathematics and Statistics, University of Canterbury, NZ
3. 2016 Jul - Aug: CORCON Gästforskare, Matematiska institutionen, Stockholms Universitet, Stockholm, Sweden
4. 2015 Sep: CORCON Gästforskare, Matematiska institutionen, Stockholms Universitet, Stockholm, Sweden
5. 2015 Jul - Dec: Principal Data Scientist with Wynyard Group's Research and Development Team (on academic leave)
6. 2015 Jan - Jun: Intelligent Systems Specialist with Wynyard Group's Research and Development Team (on academic leave)
7. 2014 - 2017: One of four core constituents of a full partner institution on the project CORCON: Correctness by Construction, Seventh Framework Programme of the European Union, Marie Curie Actions-People, International Research Staff Exchange Scheme
8. 2014: Visiting Scholar, Department of Mathematics, Cornell University, Ithaca, NY, USA
9. 2013: Erskine Fellow, Department of Statistics, University of Oxford, Oxford, UK
10. 2013: Research Chair in Mathematical Models of Biodiversity held by Veolia Environnement, French National Museum of Natural History, Paris and Centre for Mathematics and its Applications, Ecole Polytechnique, Palaiseau, France
11. 2007 - 2012: Lecturer, Department of Mathematics and Statistics, University of Canterbury, NZ
12. 2012: Visiting Scientist, Theor. Stats and Maths Division, Indian Statistical Institute, Bangalore, India
13. 2010: Visiting Scientist, Theor. Stats and Maths Division, Indian Statistical Institute, Bangalore, India
14. 2010: Visiting Faculty, Chennai Mathematical Institute, Chennai, India
15. 2005 - 2007: Research Fellow of the Royal Commission for the Exhibition of 1851, UK
16. 2005: Postdoctoral Associate, Department of Mathematics, Cornell University, USA
17. 2001 - 2003: US NSF Graduate Traineeship in Complex Nonlinear Systems, USA
18. 2001: Honorary Research Assistant, Galton Laboratory, University College London, UK
19. 1999: Summa cum laude, Minnesota State University, Mankato, USA
20. 1991 - 1994: Count Folke Bernadotte Memorial Scholar, Gustavus Adolphus

College, St.Peter, MN, USA

21. 1990: Junior Scientist of South India, South India Science Fair, Anantpur A.P., India

Industrial Experience, Contracts and Grants

1. 2016: Industry-supported cloud-computing research and teaching grants:
 - databricks academic research grant (US\$ 3,000 / month of cloud-computing) for the project *MEP: meme evolution programme* on transmission processes in social media,
 - AWS Educate & databricks academic partners cloud-infrastructure grants won for University of Canterbury's *scalable data science* course.
2. 2015: Intelligent Systems Specialist & Principal Data Scientist with Wynyard Group's Research and Development Team. Technical Lead of a team of data scientists and engineers to build a successful product ACTA — Advanced Cyber Threat Analytics for the global cyber-security software analytics market. R & D of functioning programs and prototypes for scalable cross-domain data fusion and knowledge extraction through integration of relational, logical and statistical learning methods that can identify entities of interest in various realistic security contexts.
3. 2014: “Nonparametric Self-Exciting Space-Time Point Process Model for Crime Risk Prediction”, Raazesh Sainudiin, Statistical Consulting for Wynyard Group, Christchurch, NZ, UC Contract Number 14-02-007, 2014 (confidential)
4. 2013-2014: “Intelligent Bidding Systems (Collaborative Filtering)”, Raazesh Sainudiin (with Kouros Neshantian), Ministry of Business Innovation and Employment (two year-long Capability Fellowships), Consulting for adScale Laboratories, Christchurch, NZ, UC Contract Numbers E6075 and E6076, 2013-2014
5. 2008-2009: “Imputation Variance Estimation for Statistics New Zealand's Accommodation Occupancy Survey”, Raazesh Sainudiin and Richard Penny, Statistical Consulting Report Prepared for The New Zealand Ministry of Tourism, Resource Centre 36, Sub-Project 5050300, p. 1-25, 2009 (PDF 936KB)

Representative Publications by Field

1. **Computable Mathematics and Statistics**
 - An Auto-validating Rejection Sampler for Differentiable Arithmetical Expressions: Posterior Sampling of Phylogenetic Quartets, Raazesh Sainudiin, In Martine Ceberio and Vladik Kreinovich (Eds.), Constraint Programming and Decision Making (Studies in Computational Intelligence), Springer Verlag, Berlin, Heidelberg, pp. 143-152, 2014

- A Rigorous Extension of the Schönhage-Strassen Integer Multiplication Algorithm Using Complex Interval Arithmetic, Raazesh Sainudiin and Thomas Steinke, *Reliable Computing*, vol. 18, pp. 97-116, 2013
 - An auto-validating, trans-dimensional, universal rejection sampler for locally Lipschitz arithmetical expressions, Raazesh Sainudiin and Thomas York, *Reliable Computing*, vol.18, pp.15-54, 2013
 - Applications of interval methods to phylogenetics, Raazesh Sainudiin and Ruriko Yoshida, In L. Pachter and B. Sturmfels (Eds.), *Algebraic Statistics for Computational Biology*, Cambridge Univ. Press, 2005
2. **Computational Mathematics**
 - There and Back Again: Split and Prune to Tighten, Raazesh Sainudiin, Jennifer Harlow and Warwick Tucker, *Proc. of the 2013 IEEE Int. Conf. on Fuzzy Systems*, 7 pages, 7-10 July, 2013 (PDF 512KB)
 - Mapped Regular Pavings, Jennifer Harlow, Raazesh Sainudiin and Warwick Tucker, *Reliable Computing*, vol. 16, pp. 252-282, 2012
 3. **Computational Statistics**
 - Posterior expectation of regularly paved random histograms, Raazesh Sainudiin, Gloria Teng, Jennifer Harlow and Dominic Lee, *ACM Trans. Model. Comput. Simul.* 23, 1, Article 6, 20 pages (Special Issue on Monte Carlo Methods in Statistics), 2013 (PDF 1864KB)
 4. **Mathematical and Statistical Population Genetics**
 - Ancestries of a Recombining Diploid Population, Raazesh Sainudiin, Bhalchandra Thatte, and Amandine Véber, *Journal of Mathematical Biology*, 46 pages, 2015 (preprint PDF 436KB). The final publication is available at Springer via 10.1007/s00285-015-0886-z
 - Finding the best resolution for the Kingman-Tajima coalescent: theory and applications, Raazesh Sainudiin, Tanja Stadler and Amandine Véber, *Journal of Mathematical Biology*, Volume 70, Issue 6, pp 1207-1247, 2015 (preprint PDF 384KB). The final publication is available at Springer via 10.1007/s00285-014-0796-5
 - Experiments with the Site Frequency Spectrum, Raazesh Sainudiin, Kevin Thornton, Jennifer Harlow, James Booth, Michael Stillman, Ruriko Yoshida, Robert Griffiths, Gilean McVean and Peter Donnelly, *Bulletin of Mathematical Biology*, Volume 73, Number 4, 829-872 (Special Inaugural Issue in Algebraic Biology), 2011 (AMS review)
 5. **Mathematical and Statistical Epidemiology**
 - The Transmission Process: A Combinatorial Stochastic Process for the Evolution of Transmission Trees over Networks, Raazesh Sainudiin and David Welch, *Journal of Theoretical Biology* DOI: 10.1016/j.jtbi.2016.07.038 (JTB preprint PDF 900KB), In Press, 2016.
 6. **Data Science**
 - Scalable Data Science, Raazesh Sainudiin and Sivanand Sivaram, Published by GitBook <https://www.gitbook.com/book/raazesh-sainudiin/scalable-data-science/details>, 787 pages, 30th June 2016.
 - This industry-designed course in Scalable Data Science got some publicity as *Australasia's first cloud-computing course* through

these news feeds: math.canterbury.ac.nz, educators.co.nz,
scoop.co.nz, itbrief.co.nz and computerworld.co.nz.

7. **Statistical Physics**

- A Microscopic Gibbs field model for the macroscopic yielding behavior of a viscoplastic fluid, Raazesh Sainudiin, Miguel Moyers-Gonzalez and Teodor Burghilea, *Soft Matter*, 10.1039/c5sm00857c, The Royal Society of Chemistry, 15 pages, 2015

8. **Biology (population genetics and molecular evolution)**

- A Beta-Splitting Model for Evolutionary Trees, Raazesh Sainudiin and Amandine Véber, *Royal Society Open Science* 3: 160016, 2016
- Human-assisted spread of maladaptive behavior in a critically endangered bird, Melanie Massaro, Raazesh Sainudiin, Don Merton, James V. Briskie, Anthony M. Poole and Marie L. Hale, *PLoS ONE* 8(12): e79066 DOI: 10.1371/journal.pone.0079066, 2013 (PDF of preprint 6712KB, In News: National Geographic Online, Audobon Magazine, New Scientist .)
- Detecting site-specific physicochemical selective pressures: applications to the class-I HLA of the human major histocompatibility complex and the SRK of the plant sporophytic self-incompatibility system, Raazesh Sainudiin, Wendy Shuk Wan Wong, Krithika Yogeeswaran, June Nasrallah, Ziheng Yang and Rasmus Nielsen, *Journal of Molecular Evolution* 60: 315-326, 2005
- Microsatellite mutation models: insights from a comparison of humans and chimpanzees, Raazesh Sainudiin, Richard T. Durrett, Charles Aquadro and Rasmus Nielsen, *Genetics* 168: 383-395, 2004

9. **Civil Engineering (air-traffic computing)**

- Statistical regular pavings to analyze massive data of aircraft trajectories, Gloria Teng, Kenneth Kuhn and Raazesh Sainudiin, *Journal of Aerospace Computing, Information, and Communication*, Vol. 9, No. 1, pp. 14-25, doi: 10.2514/1.I010015, 2012 (PS 31MB or lossy PDF 2.9MB or 26 PNG pages)

10. **Mechanical Engineering (gas-turbine identification and control)**

- Modeling and Simulation of the Transient Behavior of an Industrial Power Plant Gas Turbine, Asgari. H., Venturini. M., Chen. X.Q., and Sainudiin, R., *Journal of Engineering for Gas Turbines and Power*, 136(6), 061601, 2014 (In News)
- Artificial Neural Network Based System Identification for a Single-Shaft Gas Turbine, Hamid Asgari, XiaoQi Chen, Mohammad B. Menhaj and Raazesh Sainudiin, *Journal of Engineering for Gas Turbines and Power*, 135(9), 092601, 2013

11. **Natural Language Processing (word sense disambiguation)**

- An Iterative ‘Sudoku Style’ Approach to Subgraph-based Word Sense Disambiguation, Steve L. Manion and Raazesh Sainudiin, *Proceedings of the Third Joint Conference on Lexical and Computational Semantics, *SEM 2014*, Dublin, Ireland, August 23-24, 11 pages, 2014 (PDF 328 KB)

- DAEBAK!: Peripheral Diversity for Multilingual Word Sense Disambiguation, Steve Manion and Raazesh Sainudiin, Proceedings of the 7th International Workshop on Semantic Evaluation (SemEval 2013), in conjunction with the Second Joint Conference on Lexical and Computational Semantics (*SEM 2013), 5 pages, 2013 (PDF 196KB)
- 12. **Terrorism Studies (descriptive statistical patterns)**
 - Terrorist Attacks Escalate in Frequency and Fatalities Preceding Highly Lethal Attacks, Andy Martens, Raazesh Sainudiin, Chris G. Sibley, Jeff Schimel and David Webber, PLoS ONE 9(4): e93732. doi:10.1371/journal.pone.0093732, 2014
- 13. **Mathematical Art and History of Indian Combinatorics**
 - Pingala's Fountain, R. Sainudiin, R. Sridharan, M. D. Srinivas, K. Yogeewaran, Ganita Bharati: Bulletin of the Indian Society for History of Mathematics, Vol. 35, No. 1-2, pp. 117-123, 2013 (PDF 16MB)
- 14. **Mathematical and Statistical Education**
 - Extending Galton's Binomial Quincunx to the Trinomial Septcunx, Jennifer Harlow, Bry Ashman and Raazesh Sainudiin, Technology Innovations in Statistics Education, 3(2), 2009

See current list of all publications at <http://lamastex.org/publications.shtml>.

Service

- Contributor of codes at <https://github.com/raazesh-sainudiin>.
- Reviewer for the following journals and funding agencies:
 - Automatica, journal of the International Federation of Automatic Control
 - Bulletin of Mathematical Biology, the official journal of the Society for Mathematical Biology
 - Computational Statistics and Data Analysis, the official journal of the International Association of Statistical Computing
 - Genetics, published by The Genetics Society of America
 - German-Israeli Foundation for Scientific Research and Development
 - IEEE/ACM Trans. on Computational Biology and Bioinformatics
 - Journal of Logic and Analysis, officially sponsored journal of the Association for Symbolic Logic
 - Journal of Molecular Evolution
 - Mathematical Reviews (American Mathematical Society)
 - Molecular Biology and Evolution, journal of the Society for Molecular Biology and Evolution
 - PLOS Genetics, a journal of the Public Library of Science
- Organizer of the following events:
 - Interval Analysis and Constructive Mathematics (16w5099) 5-Day-

- Workshop, Casa Matemática Oaxaca (CMO) in Mexico, November 13-18, 2016
- Founding organizer of Christchurch Apache Spark (Big Data) Meetup February - August 2016
- Graduate Special Topics in Biometry and Statistics, Cornell University, Ithaca NY, USA, 12 September - 14 November 2014 (LifeNetworks2014)
- Intervals, Pavings and Applications, Uppsala, Sweden, 15-17 October 2012 (IPA2012)
- Algebraic Biology, Cass, NZ, Saturday 4th February - Friday 10th February, 2012 (ABaCass2012)
- Constructive Mathematics, Westport, NZ, Thursday 26th January - Saturday 28th January, 2012 (ConstruMathSouth2012)
- Primers at University of Canterbury
- Coordinator of a Numb3rs Learning Community and Laboratory for Mathematical Statistical Experiments.

References

- Professor Richard T. Durrett
Department of Mathematics, Duke University,
Box 90320, Durham, NC 27708-0320, USA.
Phone: +1 (919)660-6970
Email: rtd@math.duke.edu
- Professor Robert C. Griffiths FRS
Department of Statistics, University of Oxford,
24-29 St Giles' Oxford OX1 3LB, UK.
Phone: +44 (0)1865 281246
Email: griff@stats.ox.ac.uk
- Professor Warwick Tucker
Department of Mathematics, Uppsala University,
Box 480, SE-751 06, Uppsala, Sweden.
Phone: +44 18-471 3318
Email: warwick.tucker@math.uu.se

Last modified on Wed Apr 12 10:37:36 CEST 2017