CURRICULUM VITAE

Personal Details

Name	Raazesh Sainudiin
Address	724, Erskine Building, Department of Mathematics and Statistics, University of Canterbury, Private Bag 4800, Christchurch, New Zealand
Phone	+64-3-364-2987 ext 7691
Fax	+64-3-364-2587
Email	r.sainudiin@math.canterbury.ac.nz sainudii@stats.ox.ac.uk rs228@cornell.edu
URL	http://www.math.canterbury.ac.nz/~r.sainudiin
Citizen	Socialist Secular Democratic Republic of India
Gender	Male
Born	on November 15 1973 in Chennai, India
Languages	Tamil (Native), English (Fluent), Hindi and Sanskrit (Intermediate)

Professional Preparation

2005	Ph.D. in Statistics, Cornell University, Ithaca, New York, USA (*Advisor:* Richard T. Durrett)
2003	M.S. in Biometrics, Cornell University, Ithaca, New York, USA (*Advisor:* Rasmus Nielsen)
1999	B.S. in Mathematics and Biology, Minnesota State University, Mankato, Minnesota, USA

Appointments, Awards and Honors

2012-present	Senior Lecturer, Department of Mathematics and Statistics, University of Canterbury, Christchurch, New Zealand
2007-2012	Lecturer, Department of Mathematics and Statistics, University of Canterbury, Christchurch, New Zealand
2010	*Visiting Scientist, Theoretical Stats and Maths Division, Indian Statistical Institute, Bangalore, India*
2010	*Visiting Faculty, Chennai Mathematical Institute, Chennai, India*
2005-2007	*Research Fellow of the Royal Commission for the Exhibition of 1851, Mathematical Genetics and Bioinformatics Group, Department of Statistics, University of Oxford, Oxford, UK*
2005	*Postdoctoral Associate of Mathematics, Department of Mathematics, Cornell University*
2003-2005	*Research Assistant, Department of Statistical Science, Cornell University*
2001-2003	*NSF Graduate Fellow, Integrative Graduate Education, Research and Traineeship in Complex Non-Linear Systems, Cornell University*
2000-2001	*NSF Graduate Fellow, Evolution from DNA to the Organism: the Interface between Evolutionary Biology and the Mathematical Sciences, Cornell University*
2001	*Honorary Research Assistant, Galton Laboratory, University College London, London, UK*
2000	*Field Researcher in applied plant pathology, Dow AgroSciences Inc., Geneva, New York, USA*
1999-2000	*Research Assistant, Department of Plant Pathology, Cornell University*
1999	*Summa cum laude, Minnesota State University, Mankato*
1991-1993	*Count Folke Bernadotte Memorial Scholar, St. Peter, Minnesota, USA*
1990	*Junior Scientist of South India, South India Science Fair, Anantpur, Andhra Pradesh, India*

Research Publications

AS BOOKS

Machine Interval Experiments: Accounting for the Physical Limits on Empirical and Numerical Resolutions, Raazesh Sainudiin, LAP Academic Publishers, Köln, Germany, ISBN-13: 978-3838315997, 2010.

AS BOOK CHAPTERS

Applications of interval methods to phylogenetics, Raazesh Sainudiin and Ruriko Yoshida, In L. Pachter and B. Sturmfels (Eds.), Algebraic Statistics for Computational Biology, Cambridge University Press, 2005.

Models of microsatellite evolution, Peter Calabrese and Raazesh Sainudiin, In R. Nielsen (Ed.), Statistical Methods in Molecular Evolution, Series: Statistics for Biology and Health, Springer, 2004.

As Peer-reviewed Journal Articles

Statistical regular pavings to analyze massive data of aircraft trajectories, Gloria Teng, Kenneth Kuhn and Raazesh Sainudiin, Journal of Aerospace Computing, Information and Communication (accepted), 2012.

An auto-validating, trans-dimensional, universal rejection sampler for locally Lipschitz arithmetical expressions, Raazesh Sainudiin and Thomas York, Indian Statistical Institute Technical Report, isibang/ms/2010/13, p.1–34 (under review), 2012.

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, 829-87, 2011.

A Rigorous Extension of the First Schönhage-Strassen Integer Multiplication Algorithm Using Complex Interval Arithmetic, Thomas Steinke and Raazesh Sainudiin, EPTCS 24 Proceedings, Seventh International Conference on Computability and Complexity in Analysis, 2010.

Extending Galton's Binomial Quincunx to the Trinomial Septcunx, Jennifer Harlow, Bry Ashman and Raazesh Sainudiin, Technology Innovations in Statistics Education, 3(2), 2009.

Auto-validating von Neumann rejection sampling from small phylogenetic tree spaces, Raazesh Sainudiin and Thomas York, Algorithms for Molecular Biology 4:1, 2009.

Simple models of genomic variation in human SNP density, Raazesh Sainudiin, Andrew Clark and Richard Durrett, BMC Genomics 8:146, 2007.

Relative contribution of seed-transmitted inoculum to foliar populations of Phaeosphaeria nodorum, Rebecca S. Bennett, Michael G. Milgroom, Raazesh Sainudiin, Barry M. Cunfer, and Gary C. Bergstrom, Phytopathology 97(5):584-591, 2007.

Identification of physicochemical selective pressure on protein encoding nucleotide sequences, Wendy S. W. Wong, Raazesh Sainudiin and Rasmus Nielsen, BMC Bioinformatics 7:148, 2006.

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.

As Peer-reviewed Conference Proceedings

Considerations in Modelling and Control of Gas Turbines - a Review, Hamid Asgari, XiaoQi Chen and Raazesh Sainudiin, Proceedings of the 2nd International Conference on Control, Instrumentation, and Automation, Shiraz, Iran, December 27-29, 2011.

Application of artificial neural networks to rotating equipment, Hamid Asgari, XiaoQi Chen and Raazesh Sainudiin, Proceedings of the 3rd Conference on Rotating Equipment in Oil and Power Industries, Tehran, Iran, November 22-23, 2011.

Coding Projects

MRS: A C++ class library for statistical set processing with Jennifer Harlow, Warwick Tucker and Tom York. Software Library accompanying Algorithms for Molecular Biology 4:1, 2009.

LCE: A C++ class library for lumped coalescent experiments with Kevin Thornton and Brendan Bycroft. Software library accompanying Bulletin of Mathematical Biology, Volume 73, Number 4, 829-87, 2011.

Collaborators

C. F. Aquadro, J. Booth, R. S. Bennett, P. P. Calabrese, X. Chen, A. G. Clark, R. T. Durrett, P. Donnelly, R. Griffiths, K. Kuhn, J. B. Nasrallah, R. Nielsen, M. Stillman, K. Thornton, W. Tucker, W. S. W. Wong, Z. Yang, K. Yogeeswaran, T. York, and R. Yoshida.

Research Events Organized

02/2012 *ABaCass2012 or (=A(lgebraic)B(iology)a(t)CASS)2012, Algebraic Biology Workshop in the Southern Alps, Cass, South Island, New Zealand, http://www.math.canterbury.ac.nz/bio/events/ABaCass2012/ – organizer of the workshop, Saturday 4th February - Friday 10th February, 2012*

01/2012 *ConstruMath South 2012, Mathematics Workshop on applications of non-classical logic, Westport, South Island, New Zealand http://www.math.canterbury.ac.nz/research_events/ConstruMathSouth2012/ – co-organizer of the workshop, Thursday 26th January - Saturday 28th January, 2012*

Research Presentations

CONTRIBUTIONS TO THEORETICAL CONFERENCES

09/2010 *Randomised algorithms over dense trees of trees for massive metric data streams – Plenary talk at The International Congress of Mathematicians Satellite International Conference on Probability and Statistics, ICMSIC 2010, September 1-3, 2010, Sambalpur University, Sambalpur, Orissa, India, September 1 2010*

08/2010 *A C++ class library for statistical set processing – Talk at The International Congress of Mathematicians, August 19-27, 2010, Hyderabad, Andhra Pradesh, India, August 25 2010*

08/2010 *Exact transition probabilities of the number of ancestral sample lineages in the discrete ancestral recombination graph – Talk at the ICM Satellite Conference on Probability and Stochastic Processes, August 13-17, 2010, Indian Statistical Institute, Bangalore, Karnataka, India, August 14 2010*

02/2010 *Lumpings of Coalescents with Multiple Mergers – Talk at Doom2010, The Annual New Zealand Phylogenetics Meeting, Mount Ruapehu, North Island, New Zealand, February 13 2010*

12/2009 *Controlled Lumped Coalescent Markov Chains for Population Genomic Inference – Poster at the First Swedish meeting on Theory and Mathematics in Biology and Medicine, Centre for Interdisciplinary Mathematics, Uppsala University, Sweden, December 17, 2009*

11/2009 *Computational Statistics Laboratories with the SAGE Notebook Server – Unconference Talk at Kiwi PyCon 2009, Christchurch, New Zealand, November 7 2009*

02/2009 *An auto-validating trans-dimensional von Neumann rejection sampler – Talk at The 3rd Workshop on High-Dimensional Approximation, Sydney, Australia, February 16 - February 20, 2009*

02/2009 *Lumpings of a Kingman-Tajima n-Coalescent – Talk at Kaikoura'09, New Zealand Phylogenetics Conference, Kaikoura, New Zealand, February 07 - February 12, 2009*

07/2008 *Kingman's Unlabeled n-Coalescent and the site frequency spectrum – Talk at 7th World Congress in Probability and Statistics, Singapore, July 14 - July 19, 2008*

02/2008 *Kingman's Unlabeled n-Coalescent – Talk at Whitianga'08, New Zealand Phylogenetics Conference, Whitianga, New Zealand, February 10 - February 15, 2008*

10/2006 *Statistical Experiments with Machines: Accounting for the Physical Limits on Empirical and Numerical Resolutions – Poster at the Newton Institute Workshop: Recent Advances in Monte Carlo Based Inference, Cambridge, UK, 30 Oct - 3 Nov, 2006*

07/2006 *Exactly Approximate Bayesian Computations – Talk at the 2nd Cornell Probability Summer School, Cornell University, Ithaca, New York, June 26 - July 7, 2006*

04/2006 *Exactly Approximate Bayesian Computation – Talk at the European Mathematical Genetics Meeting 2006, Cardiff, UK, April 5-7, 2006*

06/2005 *Randomized Enclosure Algorithms – Poster at the SAMSI Workshop on Random Graphs and Stochastic Computation, Research Triangle Park, North Carolina, June 13-14, 2005*

03/2005 *Moore-Metropolis-Hastings Markov Chains: Sampler Pathology – Talk at the 25th Annual Seminar on Stochastic Processes, Ithaca, New York, March 24-26, 2005*

10/2004 *Rigorous Framework for Phylogenetic Inference – Poster at the 6th Annual Mt. Baldy Mathematics Conference on Geometry, Algebra, and Phylogenetic Trees, Claremont, California, October 23, 2004*

CONTRIBUTIONS TO APPLIED CONFERENCES

11/2009 *Extracting all the information from the site frequency spectrum about the hidden genealogy – Talk at the 12th Annual NZ Molecular Ecology Meeting at Catlins, Southland, New Zealand, November 28-29, 2009*

12/2007 *An integrative, critically constructive, exchange on reasonable definitions of 'genetic-units' for conservation and bio-security, in terms of, the spatio-temporal scale(s) of the geo-dermo-dynamically coupled, helio-trophic continuum in space-time – Talk at 10th Meeting Annual New Zealand Molecular Ecology Meeting, Kaikoura, New Zealand, December 07 - December 09, 2007*

04/2006 *Exactly Approximate Inference for Exponentially Growing Populations – Talk at Phylo-Group Meeting V, University College London, April 28, 2006*

01/2006 *Markov Bases for Conditional Site Frequency Spectra: Exact Bayesian Inference from Summary Statistics – Poster at the Keystone Symposium on Genome Sequence Variation and the Inherited Basis of Common Disease and Complex Traits (A2), Big Sky Resort, Montana, January 8-13, 2006*

04/2004 *Detecting site-specific physicochemical selective pressures – Talk at the Eastern Great Lakes Molecular Evolution VIII Conference, Ithaca, New York, April 24, 2004*

06/2003 *Statistical inference of microsatellite models: An application to humans and chimpanzees – Talk at the Society for Molecular Biology and Evolution Conference, Newport Beach, California, June 26-29, 2003*

INVITED TALKS

02/2011 *Approximate Bayesian Computations Done Exactly – Talk at ANR MANEGE Workshop, CMAP, École Polytechnique, Palaiseau, February 8 2011*

12/2010 *Experiments with the Site Frequency Spectrum – Talk at the Bangalore Probability Seminar, Indian Statistical Institute, Bengaluru, Karnataka, India, December 16 2010*

09/2010 *The L_1 consistency of Statistical Regular Subpavings in massive density estimation – Talk at Theoretical Statistics and Mathematics Division Seminar Series, Indian Statistical Institute, Kolkata, West Bengal, India, September 6 2010*

09/2010 *Randomised algorithms over dense trees of trees for massive metric data streams –* **Plenary Talk** *at The International Congress of Mathematicians Satellite International Conference on Probability and Statistics, ICMSIC 2010, September 1-3, 2010, Sambalpur University, Sambalpur, Orissa, India, September 1 2010*

07/2010 *Statistical Regular Sub-pavings for Multivariate Density Estimation of Massive Data – Talk at The Centre for Statistical and Survey Methodology Fellows Research Meeting, Goulburn 13, Goulburn, New South Wales, Australia, July 21 2010*

12/2009 *Statistical Regular Sub-pavings in Multi-variate Density Estimation, Ångström Laboratory, Department of Mathematics, Uppsala University, Sweden, December 16 2009*

05/2007 *Bayesian estimates of population genetic parameters using the unlabeled n-coalescent and the site frequency spectrum, Seminar, Department of Epidemiology and Public Health, Imperial College, London, United Kingdom, May 29 2007*

02/2007 *An auto-validating rejection sampler, Seminar, Centre for Research in Statistical Methodology (CRiSM), Warwick University, United Kingdom, February 15 2007*

12/2006 *Exact and approximate inference across different resolutions of DNA, Minisymposium on Genomic Introgression, National Evolutionary Synthesis Center (NESCent), Durham, North Carolina, December 17 2006*

10/2006 *An algebraic geometric approach to exact inference from classical population genetic summaries of a non-recombining locus, Seminar, Centre for Dynamical Processes and Structure Formation, Ångström Laboratory, Uppsala University, Sweden, October 18 2006*

10/2005 *Auto-validating samplers: sampling from "pathological" densities, Probability Seminar, Dept. of Mathematics, Cornell University, Ithaca, New York, October 24 2005*

10/2005 *A randomized enclosure algorithm: Moore rejection sampling, Applied Math And Analysis Seminar, Department of Mathematics, Duke University, Durham, North Carolina, October 3 2005*

03/2005 *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, Plant Pathology departmental seminar, Cornell University, March 9 2005*

02/2005 *Interval methods for parametric bootstraps, phylogenetic inference and Monte Carlo sampling, Department of Statistics, Columbia University, New York, New York, February 25 2005*

11/2004 *Rigorous numerical inference via enclosures, Mathematical Genetics and Bioinformatics Seminar, Department of Statistics, University of Oxford, Oxford, U.K., November 9 2004*

11/2004 *Enclosing the most likely clovers, Algebraic Statistics for Computational Biology Lecture, Department of Mathematics, University of California, Berkeley, California, November 30 2004*

Teaching Experience and Research Supervision

I have taught large courses for Engineering students (about 200 students) as well as small courses for honours students. I have developed over 600 pages of material to develop an entire undergraduate curriculum in computational statistics using Sage (python), R and Matlab. Please visit http://www.math.canterbury.ac.nz/ r.sainudiin/courses.shtml for detailed information. I have worked with four undergraduate research students on specific projects that have produced peer-reviewed research outputs. I am currently supervising two PhD students in High-dimensional Nonparametric Density Estimation and Massive Random Graph Inference.

Academic References

PROFESSOR RICHARD DURRETT
Duke University, Box 90320, Durham, NC 27708-0320, USA
Phone: (607) 255-8282 *Email: rtd@math.duke.edu*

PROFESSOR MICHAEL NUSSBAUM
Department of Mathematics, 441 Malott Hall, Cornell University, Ithaca, NY 14853, USA
Phone: (607) 255-3403 *Email: nussbaum@math.cornell.edu*

PROFESSOR PETER DONNELLY FRS FMEDSCI
Department of Statistics, University of Oxford, 1 South Parks Road, Oxford, OX1 3TG, UK
Phone: (+44) 1865 272860 *Email: donnelly@stats.ox.ac.uk*

PROFESSOR ROBERT C. GRIFFITHS FRS
Department of Statistics, University of Oxford, 1 South Parks Road, Oxford, OX1 3TG, UK
Phone: +44 1865 281237 *Email: griff@stats.ox.ac.uk*