Kasun Fernando

CONTACTS

Email   buddhima.akurugodage@sns.it
Web   utoronto.ca/abkf
Linkedin   linkedin.com/in/abkfernando

CITIZENSHIP

Sri Lankan
Canadian Permanent Resident

EMPLOYMENT

Centro di Ricerca Matematica Ennio De Giorgi,
Scuola Normale Superiore, Pisa
Junior Visitor, October 2021 –

Department of Mathematics, University of Toronto
Postdoctoral Fellow, August 2018 – July 2021
Supervisor: Jacopo De Simoi

EDUCATION

University of Maryland
Ph.D. in Mathematics, August 2018
- Dissertation:
  Higher order asymptotics for the Central Limit Theorem and Large Deviation Principles
  doi.org/10.13016/M2BN9X64H
- Adviser: Dmitry Dolgopyat

University of Colombo, Sri Lanka
B.Sc. in Mathematics, January 2014, First Class Honours

RESEARCH AREAS
& INTERESTS

Dynamical Systems, Probability Theory, Statistics and Machine Learning:
– statistical properties of dynamical systems and stochastic processes
– statistical inference in dynamical systems
– smooth ergodic theory
– applications of machine learning to dynamical systems, probability and statistics

PUBLICATIONS

9. **The mixing LLT and the CLT for the Riemann zeta-function sampled over Boolean-type transformations** (with Tanja Schindler) (in preparation)

8. **Statistical properties of mostly expanding partially hyperbolic systems**
(with Jacopo De Simoi) (in preparation)

7. **An error term in the central limit theorem for sums of discrete random variables**
(with Dmitry Dolgopyat) (submitted)

6. **The bootstrap for dynamical systems**
(with Nan Zou) (submitted)

5. **Robust normalizing flows using Bernstein-type polynomials**
(with Sameera Ramasinghe) (submitted)

4. **Expansions in the local and the central limit theorem for dynamical systems**
Communications in Mathematical Physics (2021) DOI: 10.1007/s00220-021-04255-z (with Françoise Pène)

3. **Edgeworth expansions for weakly dependent random variables**
Annales de l'Institut Henri Poincaré, Probabilités et Statistiques 57(1): 469-505 (2021). DOI: 10.1214/20-AIHP1085 (with Carlangelo Liverani)

2. **Higher order asymptotics for large deviations - Part II**
Stochastics and Dynamics, 21(5): (2021). DOI 10.1142/S0219493721500258 (with Pratima Hebbar)

1. **Higher order asymptotics for large deviations - Part I**
Asymptotic Analysis, 121(3-4): 219-257 (2021). DOI 10.3233/ASY-201602 (with Pratima Hebbar)

	2022	**Grant to Organize a Mini-workshop at the Centro De Giorgi** (€1000) *Scuola Normale Superiore, Pisa*
		Research Fund for Junior Researchers (€1000) *Scuola Normale Superiore, Pisa*
	2021	**The Junior Visiting Position in Dynamical Systems 2021-2023** *Centro di Ricerca Matematica Ennio De Giorgi, Scuola Normale Superiore, Pisa*
	2020	**Award for Excellence in Teaching by a Junior Member** *Mathematics and Computational Sciences Dept., University of Toronto, Mississauga.*
	2019	**UTM Postdoctoral Fellow Travel/Conference Grant** (CAD $500) *University of Toronto, Mississauga.*
	2018	**Jacob K. Goldhaber Travel Grant** (USD $600) *The Graduate School, University of Maryland, College Park.*
	2017	**Yorke Graduate Student Support Fund Travel Grant** (USD $600) *Department of Mathematics, University of Maryland, College Park.*
		Levermore Fund Travel Grant (USD $300) *Department of Mathematics, University of Maryland, College Park.*
	2016	**Yorke Graduate Student Support Fund Travel Grant** (USD $600) *Department of Mathematics, University of Maryland, College Park.*
	2015	**Yorke Graduate Student Support Fund Travel Grant** (USD $600) *Department of Mathematics, University of Maryland, College Park.*
	2014	**Dean's Fellowship** (USD $10000) *University of Maryland, College Park.*
		Opportunity Grant (USD $5000) *United States–Sri Lanka Fulbright Commission and the US Department of State.*
		Joseph Nalliah Arumugam Memorial Gold Medal *Highest academic competence at Faculty of Science, University of Colombo.*
		Gulamhusein A. J. Noorbhai Gold Medal *Best student majoring in Mathematics at University of Colombo.*
		Douglas Amarasekera Prize *Highest academic competence in Pure Mathematics at University of Colombo.*
		Dharmadasa Punchihewa Memorial Prize for Mathematics *Faculty of Science, University of Colombo.*
		Mr. and Mrs. D. P. Epasinghe Memorial Gold Medal *Faculty of Science, University of Colombo.*
	2013	**Bronze Medal at International Mathematics Competition**, Bulgaria
	2012	**Bronze Medal in Mathematics at International Scientific Olympiad**, Iran
		H. D. P. Gunawardena Memorial Prize in Physics and Mathematics *Faculty of Science, University of Colombo.*
	2011	**P. P. Jayawickrema Memorial Scholarship for Physics** *Faculty of Science, University of Colombo.*
	2010	**Scholarship for the highest academic competency in the freshman year** *Faculty of Science, University of Colombo.*
	2008	Participation in the **International Mathematical Olympiad**, Madrid, Spain
	2007	Participation in the **International Mathematical Olympiad**, Hanoi, Vietnam
	2006	Participation in the **Youth Camp for Asia's Future**, Seoul, South Korea
	2023	**Probability and Dynamics Conference**, Biological Center of Roscoff, France
	2022	**The Lorentz Gas Conference**, The Lorentz Center, Leiden, Netherlands
		Dynamics Seminar, University of Rome, Italy
		Budapest - Wien Dynamics Seminar, University of Vienna, Austria
		Combinatorics and Probability Seminar, The Ohio State University, USA
	2021	**Mathematics Seminar**, International Centre for Theoretical Physics, Italy

Dynamics Seminar, Centro di Ricerca Matematica Ennio De Giorgi, Italy

Seminar Series by Junior Visitors, Scuola Normale Superiore di Pisa, Italy

Dinamici Italiani (DAI) Seminar, Italy

Session on Ergodic Theory, Dynamical Systems, Fractals and Applications at the Canadian Mathematical Society 75th Anniversary Meeting, Ottawa, Canada

2020   **Mathematical Physics Seminar**, Yeshiva University, USA

Dynamical Systems Working Seminar, University of Oklahoma, USA

Dynamical Systems Seminar, Michigan State University, USA

Special session on Probability in Dynamical Systems of Physical Origin at the AMS Sectional Meeting, Tufts University, USA

Colloquium of the Dept. of Mathematics & Statistics, Queens University, Canada

Dynamics, Geometry, & Groups Seminar, Queens University, Canada

2019   **Conference on Dynamical Systems, Statistical Properties and their Applications**, CIRM, Marseille, France ⋆

Northeast Conference on Dynamical Systems, University of Amherst, USA

Math Postdoc Seminar, University of Toronto, Canada

Dynamics Seminar, University of Brest, France

Oberwolfach Seminar on Anisotropic Spaces and their Applications to Hyperbolic and Parabolic Systems, MFO, Oberwolfach, Germany

Session on Recent Advances in Probability and Stochastics at the Canadian Mathematical Society Summer Meeting, Regina, Canada

2018   **Dynamics at Valparaíso**, Pontificia Universidad Católica de Valparaíso, Chile ⋆⋆

Math Postdoc Seminar, University of Toronto, Canada

Dynamics Seminar, University of Toronto, Canada

Probability Seminar, University of Bologna, Italy

Dynamics Seminar, University of Rome, Italy

From Order to Chaos - Pisa 2018, Scuola Normale Superiore di Pisa, Italy ⋆⋆

Ergodic Theory Seminar, University of Warwick, UK

2017   **Probability Seminar**, University of Maryland, USA

Semi-annual Workshop in Dynamical Systems and Related Topics, Penn State University, USA ⋆

Math Department Seminar, University of Colombo, Sri Lanka

2016   **Session on Stochastic Properties of Dynamical Systems** at the Canadian Mathematical Society Winter Meeting, Niagara Falls, Canada

Semi-annual Workshop in Dynamical Systems and Related Topics, Penn State University, USA ⋆

Advising &
Mentorship

2021   **Undergraduate Student:** Ahad Moosa, University of Toronto, Mississauga

MAT497H5S - Further Studies in Mathematics

Reading Project: Stochastic analysis of chaos

Programming Project: Overcoming loss of precision in dynamical models

2018   **Undergraduate Student:** Scott Stanich, University of Maryland

Directed Reading Program (DRP) for undergraduates

Reading Project: Randomness in dynamical systems

2017   **Undergraduate Student:** Linden Yuan, University of Maryland

DRP for undergraduates

Reading Project: Ergodic theorems

2016   **Graduate Student Mentor** for the incoming group of graduate students of the math graduate program, University of Maryland

2015   **Undergraduate Student:** Adam Anderson, University of Maryland
      DRP for undergraduates
      Reading Project: Iterated function systems and fractals
      Programming Project: Using the random iteration algorithm to create fractals

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SCHOOLS,
SEMESTERS &
WORKSHOPS
ATTENDED

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2022   Probabilistic Techniques for Random & Time Dependent Dynamics, CIRM, Marseille, France

      Mathematics for AI and Machine Learning, Politecnico di Torino, Italy

      Introduction to Computational Ergodic Theory, Hokkaido Summer Institute, Japan

      Semi-annual Workshop in Dynamical Systems, University of Maryland

      Winter School on Mathematical Billiards, L'escandille, Autrans, France

2021   Quarta Giornata Dinamica, Universitá degli Studi di Parma

      CRM-PIMS Summer School in Probability, Centre de Recherches Mathématiques, Canada

      Linear Response: Rigorous Results and Applications, Bernoulli Center, EPFL, Switzerland

2020   Semi-annual Workshop in Dynamical Systems, Penn State University, USA

      Workshop on Stochastic Processes under Constraints, MFO, Oberwolfach, Germany

2019   Thermodynamic Formalism: Applications to Probability, Geometry & Fractals, CIRM, Marseille, France

      Anisotropic Spaces: Applications to Hyperbolic & Parabolic Systems, MFO, Oberwolfach, Germany

      Probabilistic Methods in Negative Curvature, ICTS, Banglore, India

      Dynamical Systems: From geometry to mechanics, University of Rome, Italy

2018   Dynamics at Valparaíso, Pontificia Universidad Católica de Valparaíso, Chile

      Summer School on Dynamical Systems 2018, University of Houston, USA

      TMU-ICTP School & Conference on Dynamical Systems & Ergodic Theory, Tehran, Iran

      From Order to Chaos - Pisa 2018, Pisa, Italy

      Probability, Analysis and Dynamics '18, University of Bristol, UK

2017   Semi-annual Workshop in Dynamical Systems, Penn State University, USA

      Conference on Mathematical Physics Perspective of Billiards and Dominoes, University of Massachusetts, Amherst, USA

      Dynamics in Number Theory and Geometry, Queen's University, Canada

      Rigidity Phenomena via Ergodic Methods, University of Utah, USA

      Workshop on Dynamical Systems and Related Topics, University of Maryland, USA

      Thematic Month on Dynamical Systems and Interactions, Session on Homogeneous Spaces, Diophantine Approximation and Stationary Measures, CIRM, Marseille, France

2016   Stochastic Properties of Dynamical Systems session at Canadian Mathematical Society Winter Meeting, Niagara Falls

      Semi-annual Workshop in Dynamical Systems, Penn State University, USA

      Connections Between Complex Dynamics, Statistical Physics, and Limiting Spectra of Self-similar Group Actions, IUPUI, USA

      Summer School on Dynamical Systems 2016, University of Houston, USA

      Mixing and Averaging Methods in Dynamical Systems, Erwin Schrodinger Institute, Vienna, Austria

      Workshop on Dynamical Systems, University of Maryland, USA

2015   Semi-annual Workshop in Dynamical Systems, Penn State University, USA

      Getting Started with PDEs, Hebrew University of Jerusalem, Israel

      IMA Summer Graduate Program on Modern Harmonic Analysis and its Applications: University of Maryland, USA

      Summer School on Dynamical Systems 2015, University of Houston, USA

      Workshop on Dynamical Systems and Related Topics, University of Maryland, USA

2022 **Co-organizer, Dynamics Seminar**, Centro di Ricerca Matematica Ennio De Giorgi

YouTube Video Series (continued) discussing advanced math topics to popularize math among Sri Lankan students, in collaboration with Fadil Iqbal, IQ Labs YouTube channel

2021 **Instructor at the Math Contest Preparation Club** organized by the Math Outreach Office, Department of Mathematics, University of Toronto, Canada

Instructor at the Canada Math Camp organized by the Canadian Mathematical Society and the UofT Department of Mathematics for top grade 8, 9 and 10 students in the Canadian Open Mathematics Competition (COMC)

2020 **Speaker at the UofT Undergraduate Mathematics Union Seminar** organized for introducing research level mathematics to undergraduates

Co-trainer, Putnam competition training sessions, University of Toronto, Canada

Co-instructor, Math Circles, Fields Institute, Toronto, Canada

Part 3 of the YouTube Video Series - How to Become a Scientist targeting Sri Lankan students, in collaboration with Ashan Ariyawansa, NC Astronomy YouTube channel

2019 **Reviewer** – Communications in Mathematical Physics & Journal of Statistical Physics

Co-instructor, Math Circles, Fields Institute

Co-trainer, COMC grader training sessions.

Pedagogical Reading Group, University of Toronto, Mississauga

2018 **Teaching Assistant, Houston Summer School on Dynamical Systems**

Organizer of Spring 2018 Student Probability Seminar, University of Maryland

2017 **Organizer of Spring 2017 Student Dynamics Seminar**, University of Maryland

Volunteer at the National Math Festival 2017 organized by the MSRI

Representative of the College of CMNS of University of Maryland in the Graduate School Fair at the McNair Conference 2017

2016 **Speaker on the topic Graduate Application Process and Securing Assistantships at US Universities** organized by the United States - Sri Lanka Fulbright Commission

2014 **Co-trainer of the Sri Lankan Team**, International Mathematics Competition (IMC) for high school students, Daejeon, South Korea

Co-organizer of the Sri Lankan Mathematical Olympiad (SLMO) 2014

Co-editor of the Grade 6 mathematics text book (used from 2015 to 2022 in Sri Lankan public schools)

Observer for the Official Languages Commission, Sri Lanka

2013 **Leader of the Sri Lankan Team**, IMC, Burgas, Bulgaria

Co-trainer of the Sri Lankan Team, International Mathematical Olympiad (IMO), Santa Marta, Colombia

Co-organizer of the SLMO 2013

2012 **Leader of the Sri Lankan Team**, IMC, Taipei, Taiwan

Co-trainer of the Sri Lankan Team, IMO, Mar del Plata, Argentina

Co-organizer of the SLMO 2012

2011 **Deputy Leader of the Sri Lankan Team**, IMC, Bali, Indonesia

Co-trainer of the Sri Lankan Team, IMO, Amsterdam, Netherlands

Co-organizer of the SLMO 2011

2010 **Deputy Leader of the Sri Lankan Team**, IMC, Incheon, Korea

Co-trainer of the Sri Lankan Team, IMO, Astana, Kazakhstan

Co-organizer of the SLMO 2010

2008 **A Student Organizer of the National Maths & Science Olympiad**, Sri Lanka

INSTRUCTOR TRAINING	2021	**Developing Curriculum, Blended Learning, Flipped Classroom** Linkedin Learning course series on modern teaching techniques **Core Strategies for Teaching in Higher Ed** Linkedin Learning course by Prof. Karl Kapp on effective teaching at the college level
	2020	**Summer Camp on Online Teaching** – a week-long course on online teaching techniques Teaching and Learning Collaboration, University of Toronto, Mississauga
	2019	**Pedagogical Reading Group** Read and discussed *What the Best College Teachers Do* by Prof. Ken Bain Teaching and Learning Collaboration, University of Toronto, Mississauga
	2018	**Course design 101** – a day-long workshop on course design Teaching and Learning Collaboration, University of Toronto, Mississauga
	2014	**Teaching Seminar** – a semester-long 1 credit graduate course on teaching techniques Department of Mathematics, University of Maryland

TEACHING EXPERIENCE

Minicourses (designed and taught)

2021	Dynamical Systems: Stability, Bifurcations & Applications, International Conference on Multidisciplinary Approaches in Science, University of Colombo
2019	Higher-order Asymptotics for Limit Theorems in Dynamical Systems, University of Toronto Introduction to Dynamical Systems, University of Colombo

Instructor at the Math Outreach Office, University of Toronto

Sep–Oct	2021	Math Contest Preparation Club (online)
July	2021	Canada Math Camp 2021 (online)

Instructor at the University of Toronto

Winter	2021	MAT232 Calculus of Several Variables (online)
Fall	2020	STA348 Introduction to Stochastic Processes (online)(course page)
Winter	2020	MAT311 Partial Differential Equations (course page)
Fall	2019	MAT332 Introduction to Nonlinear Dynamics & Chaos (course page)
Winter	2019	MAT135 Calculus
Fall	2018	MAT135 Calculus

Instructor at Sri Lanka Olympiad Mathematics Foundation (SLOMF)

2009 –	2014	Selecting, training and facilitating the Sri Lankan IMO and IMC teams

Teaching Assistant at the Scuola Normale Superiore di Pisa

Fall	2021	Introduction to Dynamical Systems I

Teaching Assistant at the University of Maryland

Spring	2018	STAT601 Probability II, STAT410 Intro to Probability
Fall	2017	MATH670 ODE I, MATH403 Introduction to Abstract Algebra
Fall	2016	MATH220 Elememtary Calculus
Spring	2016	MATH310 Introduction to Proofs
Summer	2015	MATH410 Advanced Calculus I, MATH310 Introduction to Proofs
Fall	2015	MATH141 Calculus II
Spring	2015	MATH241 Calculus III
Fall	2014	MATH220 Elememtary Calculus

Teaching Assistant at the University of Colombo

1st Sem.	2014	PM4003 Measure Theory, PM3052 Real Analysis I, PM3054 Topology I, PM2001 Calculus II

PROGRAMMING	Java, LaTeX, python, R and julia
LANGUAGES	English and Sinhala - Bilingual Italian - Elementary (CEFRL Level A2)