

# CURRICULUM VITAE: ROSS HORNE

## PERSONAL DETAILS

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NATIONALITY AND DATE OF BIRTH: British, 6th May 1983  
EMAIL: [rhone@ntu.edu.sg](mailto:rhone@ntu.edu.sg)  
MARITAL STATUS: married with two children  
HOMEPAGE: <http://satoss.uni.lu/members/ross/>

## INTRODUCTION

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I am a research associate in the “Security and Trust of Software Systems” group at University of Luxembourg, lead by Prof. Sjouke Mauw. My previous research experience includes a senior research fellowship in the Cyber Security Lab at Nanyang Technological University, Singapore (11th in QS world university rankings 2018). I also have four years of leadership experience as associate professor at Kazakh-British Technical University, Kazakhstan, building a joint master program with Lancaster University, UK. I obtained my PhD in Computer Science from the University of Southampton, UK; and a first-class degree in Mathematics & Computer Science from Oxford University, UK.

My research applies foundations (logic, types, semantics) to protocol analysis, not limited to cryptographic protocols and distributed ledgers. I am corresponding author for the best paper at CONCUR’17.

## EDUCATION

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| 2011       | PhD. Electronics and Computer Science, University of Southampton, England<br><i>Computer Science</i><br>I defended my PhD thesis in Computer Science, under Prof. Vladimiro Sassone. The thesis, <i>Programming Languages and Principles for Read-Write Linked Data</i> , develops a new foundation for emerging Web technologies. The examiners were Dr. Alessio Guglielmi and Dr. Corina Cirstea. My work targeted the W3C SPARQL Working Group, which has impact on Web standards. My research was funded by an EPSRC scholarship. I assisted teaching logic, set theory, automata theory and formal methods. I chaired the 6th Wessex Theory Seminar.   |
| PHD THESIS | <i>Programming Languages and Principles for Read-Write Linked Data.</i>   |
| 2005/2007  | BA & MA. Lady Margaret Hall, Oxford University, England<br><i>Mathematics and Computer Science</i><br>I was awarded my BA, upgraded to MA, in Mathematics and Computer Science with first class honours. I was awarded the Data Connection Project Prize for the best final year thesis. The thesis, titled <i>Computable Cyclic Functions</i> , supervised by Dr. Jeff W. Sanders, received the exceptional mark of 97%.<br>I was awarded a scholarship for academic achievement, and the college Computation Prize for a philosophical essay. My final topics were as follows: Complexity Theory, Denotational Semantics, Logic, Set Theory, Specification, Data Structures and Algorithms, Complex Analysis, Topology, Lebesgue Integration and Functional Analysis. Oxford University awards an MA retrospectively 7 years after enrolling. |
| BA THESIS  | <i>Computable Cyclic Functions</i> . First prize in Computer Science.   |
| 2001       | Secondary education. Kelso High School, Scotland<br>I was awarded the Dux Medal, which acknowledges the highest academic achievement in my year group. My Scottish Qualification Certificate grades are: Advanced Higher (Mathematics A, Computer Science A, Physics A, Music A), Higher (French A, Geography A, English B), Intermediate (Art A, Chemistry A).   |

## EMPLOYMENT

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2018 SEPTEMBER–NOW	<p>Research Associate. Computer Science and Communications Research Unit, University of Luxembourg</p> <p>I am a member of the “Security and Trust of Software Systems” group lead by Prof. Sjouke Mauw. My research and teaching is in the area of security and privacy.</p>
2015 DECEMBER–2018 AUGUST	<p>Senior Research Fellow. School of Computer Science and Engineering, Nanyang Technological University, Singapore</p> <p>I was a member of the Cyber Security Lab involved in several projects. The first project lead by Ass.Prof. Alwen Tiu advances techniques for the automated verification and certification of security protocols and is funded by the Ministry of Education of Singapore. I also contributed to projects lead by Assoc.Prof. Liu Yang, which aims to formally verify security properties for a micro-kernel down to the underlying hardware and is funded by the National Research Foundation of Singapore. I supervised undergraduate projects, coordinated seminars and served on the organising committee for SG-CRC 2018.</p> <p>On 6 September 2017, I received the best paper award at CONCUR 2017. The paper provided a solution for a key problem in concurrency that had stood for almost 30 years, while introducing novel techniques and insight (with practical implications for verifying protocols).</p>
2015 NOVEMBER	<p>Visiting researcher. Electronics &amp; Computer Science, University of Southampton, Southampton, UK</p> <p>I was funded by a Newton–al-Farabi Researcher Mobility Grant to conclude my line of work with Prof. Sassone on descriptive types.</p>
2015 SEPTEMBER–OCTOBER	<p>Visiting professor. Faculty of Engineering &amp; Natural Sciences, Süleyman Demirel University, Almaty, Kazakhstan</p> <p>I was invited as a keynote for the regional conference ICECCO 2015 held in this period at the university. I delivered a module on Distributed Systems for Big Data.</p>
2012 NOVEMBER–2016 JANUARY	<p>Associate professor. Faculty of Information Technology, Kazakh-British Technical University, Almaty, Kazakhstan</p> <p>I co-authored grant applications that brought British Council grants worth over £300,000 into the university. The grants funded two competitively-funded research fellowships, seminars and researcher mobility. I chaired the workshop Embracing Global Computing in Emerging Economies (see <a href="http://emerging.kbtu.kz">emerging.kbtu.kz</a>), featuring speakers from leading universities in Europe and Kazakhstan as well as professionals from industry, with proceedings published by Springer. I chaired 30 meetings of the Almaty Seminar Series in Computer Science, encouraging fundamental research in Almaty.</p> <p>I contributed significantly to a joint master course with Lancaster University, UK. In teaching, I cover: major lasting foundational achievements by some of the greatest computer scientists; and recent advances in systems, with an emphasis on distributed systems for Cloud computing. I supervised 6 master theses. In September 2014, we founded the Department of Electrical Engineering and Computer Science, where I contributed to the development of the computer science curriculum.</p>
2012 SEPTEMBER–OCTOBER	<p>Assistant professor. Faculty of Information Technology, Kazakh-British Technical University, Almaty, Kazakhstan</p> <p>I was promoted quickly to the position above.</p>
2012 FEBRUARY–AUGUST	<p>Research associate. Institute of Computer Science, Romanian Academy. Iasi, Romania</p> <p>I was a member of the Laboratory of Formal Methods in the Institute of Computer Science at the Romanian Academy of Science. My position was funded by a grant from the National Authority for Scientific Research led by Prof. Gabriel Ciobanu. It is my pleasure to continue collaborating with this team.</p>

## PUBLICATIONS

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For publications where the Hardy-Littlewood rule was applied and I am not listed as first author, I indicate where I am corresponding author. In all papers I conducted the majority of research and writing, except ICCS' 14.

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| JOURNALS    | <p><i>Constructing Weak Simulations from Linear Implications for Processes with Private Names</i>. R. Horne, and A. Tiu. <i>Mathematical Structure in Computer Science</i>. Cambridge University Press. accepted 2018</p> <p><i>Semantics for Specialising Attack Trees based on Linear Logic</i>. R. Horne, S. Mauw, and A. Tiu. <i>Fundamenta Informaticae</i>. Volume 153, pages 57-86. IOS Press. 2017</p> <p>[corresponding author] <i>A Descriptive Type Foundation for RDF Schema</i>, G. Ciobanu, R. Horne, and V. Sassone. <i>Journal of Logical and Algebraic Methods in Programming</i>. Volume 85, Issue 5, Part 1, Pages 681-706. Elsevier. 2016</p> <p>[corresponding author] <i>Minimal Type Inference for Linked Data Consumers</i>, G. Ciobanu, R. Horne, and V. Sassone. <i>Journal of Logical and Algebraic Methods in Programming</i>. Volume 84(4), pages 485-504. Elsevier. 2015</p> <p><i>The Consistency and Complexity of Multiplicative Additive System Virtual</i>, R. Horne. <i>Scientific Annals of Computer Science</i>. Volume 25(2), pages 245-316, 2015</p> <p><i>A Verified Algebra for Read-Write Linked Data</i>, R. Horne, and V. Sassone. <i>Science of Computer Programming</i>. Volume 89(A), pages 2-22. Elsevier. 2014</p> <p><i>Tracing Where and Who Provenance in Linked Data: a Calculus</i>, M. Dezani-Ciancaglini, R. Horne, and V. Sassone. In T. Aoto, A. Middeldorp editors, <i>Theoretical Computer Science</i>. Volume 464, pages 113-129. Elsevier. 2012</p> |
| EDITORSHIP  | <p><i>Embracing Global Computing in Emerging Economies</i>, 26-28 February, Almaty, Kazakhstan, Editor: R. Horne. CCIS 514. Springer. 2015</p>   |
| PROCEEDINGS | <p><i>Quasi-Open Bisimilarity with Mismatch is Intuitionistic</i>, R. Horne, K. Y. Ahn, S. W. Lin, and A. Tiu. In <i>Proceedings of LICS '18: 33rd Annual ACM/IEEE Symposium on Logic in Computer Science</i>, Oxford, United Kingdom, July 9-12, 2018 (LICS'18). 10 pages. 2018</p> <p>[best paper award, corresponding author] <i>A Characterisation of Open Bisimilarity using an Intuitionistic Modal Logic</i>, K.-Y. Ahn, R. Horne, and A. Tiu. In <i>proceedings CONCUR 2017</i>. Editors: R. Meyer and U. Nestmann; Article No. 7; pp. 1-17. LIPIcs. 2017</p> <p><i>Private Names in Non-Commutative Logic</i>, R. Horne, A. Tiu, B. Aman, and G. Ciobanu. In <i>proceedings CONCUR 2016</i>. Editors: J. Desharnais and R. Jagadeesan; pp. 31:1-31:15. LIPIcs. 2016</p> <p>[corresponding author] <i>SPEC: An Equivalence Checker for Security Protocols</i>, A. Tiu, N. Nguyen, and R. Horne. In <i>proceedings APLAS 2016</i>, Hanoi, Vietnam, November 21-23, Editor A. Igarashi. LNCS 10017. pages 87-95. Springer. 2016</p> <p>[corresponding author] <i>Behavioural Analysis of Sessions using the Calculus of Structures</i>, G. Ciobanu, and R. Horne. <i>Perspectives of Systems Informatics</i>, In <i>proceedings of 10th Ershov Informatics Conference, PSI 2015</i>, Kazan and Innopolis, Russia, August 24-27, Editors: M. Mazzara and A. Voronkov. LNCS 9609. pages 91-106. Springer. 2016</p>   |

## PUBLICATIONS (CONTINUED)

PROCEEDINGS	[corresponding author] <i>Descriptive Types for Linked Data Resources</i> , G. Ciobanu, R. Horne, and V. Sassone. Perspectives of Systems Informatics, In proceedings of 9th Ershov Informatics Conference, PSI 2014, 24-27 June, St. Petersburg, Russia. LNCS 8974, pages 1-25. Springer. 2015
	<i>Extracting Threshold Conceptual Structures from Web Documents</i> , G. Ciobanu, R. Horne and C. Vaideanu. In proceedings of International Conference on Conceptual Structures (ICCS 2014), N. Hernandez et al. editors., LNAI 8577, pages 130-144. Springer. 2014
	<i>Ensuring Faultless Communication Behaviour in A Commercial Cloud</i> , R. Horne, and T. Umarov. BEAT II. LNCS 8368. pages 44-55. Springer. 2014
	[corresponding author] <i>Non-interleaving Operational Semantics for Geographically Replicated Databases</i> , G. Ciobanu, and R. Horne. In proceeding SYNACS 2013, 23-26 September, Timisoara, Romania. pages 440-447. IEEE. 2013
	[corresponding author] <i>Local Type Checking for Linked Data Consumers</i> , G. Ciobanu, R. Horne, and V. Sassone. In proceedings of WWV 2013. 6 June, Florence, Italy. Electronic Proceedings in Theoretical Computer Science, volume 123, pages 19-33. 2013
	[corresponding author] <i>A Provenance Tracking Model for Data Updates</i> , G. Ciobanu, and R. Horne. In Proceedings FOCLASA 2012. Newcastle, UK. 8 August 2012. Electronic Proceedings in Theoretical Computer Science, volume 91. pages 31-44. 2012
	<i>Operational Semantics for SPARQL Update</i> , R. Horne, V. Sassone, and N. Gibbins. In J. Z. Pan, et al. editors, 1st Joint International Semantic Technology Conference. Hangzhou, China. 4-7 December. pages 240-255. Springer. 2011
<i>A Verified Algebra for Linked Data</i> , R. Horne, and V. Sassone. In Proceedings FOCLASA 2011. Aachen, Germany. 10 August 2011. Electronic Proceedings in Theoretical Computer Science, volume 58. pages 20-33. 2011	
THESIS	<i>Programming Languages and Principles for Read-Write Linked Data</i> . PhD Thesis. School of Electronics and Computer Science, University of Southampton. 2011.
	<i>Computable Cyclic Functions</i> . BA thesis. Oxford University. 2005.

## THESIS SUPERVISION

NTU UNDERGRADUATE	<i>Developing a Xen Hypervisor based alternate defence against cipher suite downgrade attacks for Virtual TLS Servers</i> . Pathangi Janardhanan Jatinsravan, with A. Tiu. 2017
LANCASTER UNIVERSITY MASTER	<i>Architectural Solutions for Cloud-Enabled Systems</i> . Chingiz Kussainov. 2015
	<i>Mobile distributed peer-to-peer storage based on iOS multipeer communication framework</i> . Yessenzhar Kanapin. 2015
KBTU MASTER	<i>Interloud Sessions: Cloud Brokers and Cloud Exchanges</i> . Oleg Trubitsin. 2015
	<i>Microvirtualisation and Runtime Monitors for Security</i> . Raman Buzaubakov. 2016
	<i>Opening up Government Data in Kazakhstan</i> . Dauren Yesmukhanov. 2015
	<i>Minimal Type Inference In RDFS</i> . Vladimir Li. 2015
KBTU UNDERGRADUATE	<i>Creating a Knowledge Base Using Semantic Technologies</i> . Mirzhan Irkegulov. 2013

## TEACHING

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I have delivered 19 courses, 15 of which at master level. Of these course 17 I developed and delivered as the sole lecturer.

AUTUMN 2018	<i>Security protocols.</i> master module for University of Luxembourg. Delivered with Prof. Sjouke Mauw, Dr. Yunior Ramirez and Mr. Zach Smith.
AUTUMN 2015	<i>Distributed Systems for Big Data.</i> undergraduate module for SDU.
SPRING 2015	<i>Data Management.</i> master course for KBTU. <i>Programming Technologies.</i> undergraduate module for KBTU. <i>Web of Data.</i> undergraduate module for KBTU.
AUTUMN 2014	<i>Infrastructure: Cloud computing.</i> master module for KBTU. <i>Domain Specific Languages.</i> master module for KBTU. <i>Semantics of Programming Languages.</i> undergraduate module for KBTU.
SPRING 2014	<i>Architecture: Web of Data.</i> master module for KBTU. <i>Data Management.</i> master module for KBTU. <i>Advanced Functional Programming.</i> master module for KBTU.
AUTUMN 2013	<i>Infrastructure: Cloud computing.</i> master module for KBTU. <i>Analysis and Modelling of Information Processes.</i> master module for KBTU.
SPRING 2013	<i>Architecture: Web of Data.</i> master module for KBTU. <i>Data Management.</i> master module for KBTU. <i>Advanced Distributed Systems.</i> master module for Lancaster University. Delivered with Prof. Gordon Blair and Prof. Geoff Coulson.
AUTUMN 2012	<i>Infrastructure: Cloud computing.</i> master module for KBTU. <i>Constructive Logic.</i> master module for Lancaster University. <i>Analysis and Modelling of Information Processes.</i> master module for KBTU.

## PROFESSIONAL ACTIVITIES

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ORGANISER/CHAIR	<i>SG-CRC 2018.</i> 3rd Singapore Cybersecurity R&D Conference <i>EGC 2015.</i> 1st Workshop on Embracing Global Computing in Emerging Economies
PROGRAM COMMITTEES	<i>MiDOS@SAC 2019.</i> Microservices, DevOps, and Service-Oriented Architecture at 34th ACM/SIGAPP Symposium On Applied Computing <i>ICTAC 2018.</i> 15th International Colloquium on Theoretical Aspects of Computing <i>SOAP@SAC 2017/2018.</i> Service-Oriented Architectures and Programming track of the 32/33rd ACM/SIGAPP Symposium On Applied Computing <i>CrossCloud 2014/2015/2016/2018.</i> 1/2/3/5th Workshop on CrossCloud Infrastructures & Platforms <i>BEAT 2014.</i> 3rd International Workshop on Behavioural Types <i>ICTAC 2014.</i> 11th International Colloquium on Theoretical Aspects of Computing
REVIEWER (JOURNALS)	ACM Transactions on Computational Logic, Logical Methods in Computer Science, Logical and Algebraic Methods in Computer Science, Mathematical Structures in Computer Science, Scientific Annals of Computer Science, The Computer Journal
REVIEWER (CONFERENCES)	CONCUR, TCS, FoSSaCS, TACAS, ESOP, PSI, MFPS, FSCD, ICST, ANT

## SKILLS AND INTERESTS

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My native language is English. I also speak fluent French and basic Russian. I was a musician — before starting a family I played music semi-professionally — and still enjoy music. Probably, few people enjoyed my indulgence in progressive rock; but a jig I composed in the 90's is still played in the traditional music scene. Maybe one day I'll find the time to write about harmony. I am naturally a leader, constantly applying initiative.