Dr Natasha Fernandes

Postdoctoral Associate, Macquarie University

tashfernandes@gmail.com ☎+61 447 769 514 Sydney, Australia

natasha-fernandes-4b201139 https://github.com/tashfernandes

Education and Qualifications

Ph.D in Computing Conferred: August, 2021

Macquarie University, Australia & École Polytechnique, Palaiseau, France

Thesis Title Differential Privacy for Metric Spaces: Information-Theoretic Models for Privacy and Utility with New Applications to Metric Domains

Supervisors Prof. Annabelle McIver and Prof. Catuscia Palamidessi

Masters of Research in Computing & University Medal 2017

Macquarie University, Australia

Thesis Title A Novel Framework for Author Obfuscation using Generalised Differential Privacy

B.Sc in Pure Mathematics and Computer Science 1997

University of Sydney, Australia

Associate Fellow of the Higher Education Academy (AFHEA) Dec, 2021

Research Interests

Differential privacy, d-privacy, text privacy, quantitative information flow, information theory.

Recent Awards & Scholarships

2022	Winner, John Makepeace Bennett Award for Best Computing Phd Dissertation in Australia & NZ.
2021	Recipient, Faculty of Science and Engineering Excellence in HDR Award (Macquarie University).
2021	Vice-Chancellor's Commendation for PhD Dissertation (Macquarie University).
2021	HDR Rising Star Award (Dept of Computing, Macquarie University).
2019-20	Data61 Top-up Scholarship.
2018-20	Commonwealth Research Training Pathway Scholarship.
2018	University Medal for Computing (Macquarie University).
2017	Cyber Security MRes Computing Prize for Academic Excellence (Macquarie University).

Grants

2021-22	Associate Investigator, ExploreCSR grant (Google philanthropic)	$12,900
2021-22	Associate Investigator, TensorFlow for Autonomous Vehicles (Google philanthropic)	$13,065
2020	PGRF Grant for Overseas Conference Travel (Macquarie University)	$2,926

Recent Employment History

Nov 2021 - present *Postdoctoral Associate, Macquarie University, Sydney*

Aug 2021 - Nov 2021 *Postdoctoral Research Fellow, UNSW Canberra*

Mar 2020 - July 2021 *Research Assistant / Sessional Tutor, Macquarie University, Sydney*

Jan 2012 - Jan 2015 *Lead Engineer - Data Engineering Team, Yahoo!7, Sydney*
Responsibilities: Scoping and delivery of Semantic web publishing platform, design and implementation of NLP pipeline; mentoring junior developers.
Technologies: Semantic Web, NLP, Java, RabbitMQ, Graph databases, Protege (data modeling), SPARQL, Service Oriented Architecture (SOA), RDF

Jan 2008 - Dec 2011 *Senior Software Engineer - Media Engineering Team, Yahoo!7, Sydney*
Responsibilities: Technical specification, data modeling, code design, technical documentation and delivery of projects including Plus7 (catchup tv), 2011 Rugby World Cup website and the 2010 Australian federal election website.
Technologies: PHP, XML, XSLT, RESTful webservices, Perl, git, cvs

Invited Talks

- Invited Keynote Address, Australian Computer Science Weekly Conference, Sydney, Feb 2022.
- *Using Mathematics to Make Data Privacy Explainable*, Computing Industry Networking Event, Macquarie University, Dec 2021.
- *Comparing Systems: Quantitative Information Flow Refinement Orders and Application to Differential Privacy*, Alan Turing Institute, London, Aug 2021.
- *Locality Sensitive Hashing with Extended Differential Privacy*, France-Japan Cybersecurity Workshop, Bordeaux, Feb 2021.
- *Leakage and Refinement: A QIF Approach to Differential Privacy*, AIST, Tokyo, Oct 2019.

Professional Activity

- Invited Attendee at Shonan Meeting #164: *Differential Privacy and its Applications*, Nov, 2022.
- PC Member, Workshop on Privacy in Natural Language Processing (PrivateNLP), 2020-2021.
- Reviewer, Artificial Intelligence Review Journal, 2022.
- Reviewer, Journal of Transactions on Information Forensics and Security, 2021.
- Sub-Reviewer, International Symposium on Formal Methods (FM), 2021.
- Sub-Reviewer, Journal of Transactions on Dependable and Secure Computing, 2020.
- Sub-Reviewer, International Conference on Logic for Programming, AI and Reasoning (LPAR), 2020.
- Sub-Reviewer, Computer Security Foundations Symposium (CSF), 2019.
- Thesis Defence Examiner, UFMG Brazil, 2021.

Teaching & Curriculum Development

- Sessional Tutor, Macquarie University, 2020-21.
  - COMP2320 (Offensive Security).
  - COMP2010 (Algorithms and Data Structures).
- Indigenous Student Tutor, Macquarie University, 2018:
  - MATH1015 (1st Year Mathematics).
  - COMP7860, COMP8990 (Postgraduate Computing Research Units).

Peer-Reviewed Publications

Conference Papers

1. Fernandes, N, A McIver, and C Morgan (2022). How to Develop an Intuition for Risk... and Other Invisible Phenomena. In: *30th EACSL Annual Conference on Computer Science Logic (CSL 2022)*. Ed. by F Manea and A Simpson. Vol. 216. Leibniz International Proceedings in Informatics (LIPIcs). Dagstuhl, Germany: Schloss Dagstuhl – Leibniz-Zentrum für Informatik, pp.2:1–2:14. https://drops.dagstuhl.de/opus/volltexte/2022/15722.
2. Fernandes, N, Y Kawamoto, and T Murakami (2021). Locality sensitive hashing with extended differential privacy. In: *European Symposium on Research in Computer Security*. **CORE Ranking: A**. Springer, pp.563–583.
3. Fernandes, N, A McIver, and C Morgan (2021). The Laplace Mechanism has optimal utility for differential privacy over continuous queries. In: *ACM/IEEE Symposium on Logic in Computer Science (LICS 2021)*. **CORE Ranking: A***. IEEE.
4. Alvim, MS, N Fernandes, A McIver, and GH Nunes (2020). On Privacy and Accuracy in Data Releases (Invited Paper). In: *31st International Conference on Concurrency Theory (CONCUR 2020)*. **CORE Ranking: A**. Ed. by I Konnov and L Kovács. Vol. 171. Leibniz International Proceedings in Informatics (LIPIcs). Dagstuhl, Germany: Schloss Dagstuhl–Leibniz-Zentrum für Informatik, pp.1:1–1:18. https://drops.dagstuhl.de/opus/volltexte/2020/12813.
5. Chatzikokolakis, K, N Fernandes, and C Palamidessi (2019). Comparing systems: max-case refinement orders and application to differential privacy. In: *IEEE 32nd Computer Security Foundations Symposium (CSF 2019)*. **CORE Ranking: A**. IEEE, pp.442–44215.
6. Fernandes, N, M Dras, and A McIver (2019). Generalised differential privacy for text document processing. In: *International Conference on Principles of Security and Trust (ETAPS/POST)*. Springer, Cham, pp.123–148.
7. Fernandes, N, K Lefki, and C Palamidessi (2019). "Utility-Preserving Privacy Mechanisms for Counting Queries". In: *Models, Languages, and Tools for Concurrent and Distributed Programming*. Springer, Cham, pp.487–495.
8. Fernandes, N, M Dras, and A McIver (2018). Processing text for privacy: an information flow perspective. In: *International Symposium on Formal Methods (FM 2018)*. **CORE Ranking: A**. Springer, Cham, pp.3–21.

Journal Papers

1. Chatzikokolakis, K, N Fernandes, and C Palamidessi (2021). Refinement Orders for Quantitative Information Flow and Differential Privacy. *Journal of Cybersecurity and Privacy* **1**(1), 40–77.