

Alice Toniolo

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RESEARCH OVERVIEW

My research lies in the context of computational models of argumentation, a field of Artificial Intelligence, concerned with reasoning and dialogue under conflicting and incomplete information. Drawing from philosophical studies of human argumentation, my research aims to develop intelligent systems to support people become better decision-makers by improving quality and awareness of individual and collaborative reasoning.

APPOINTMENTS HELD

October 2016 – Present: *Lecturer in Computer Science*
School of Computer Science, University of St Andrews, UK
May 2013 – August 2016: *Research Fellow*
Department of Computing Science, University of Aberdeen, UK.
Nov 2012 – May 2013: *Research Assistant*
Department of Computing Science, University of Aberdeen, UK.

EDUCATION

Ph.D., Computer Science, 2013
Department of Computing Science, University of Aberdeen, UK. Title: “Models of Argument for Deliberative Dialogue in Complex Domains”.
M.Sc., Computer Engineering, 2009
Department of Information Engineering, Faculty of Engineering, University of Padova, Italy.
B.Sc., Computer Engineering, 2006
Department of Information Engineering, Faculty of Engineering, University of Padova, Italy.

SELECTED PUBLICATIONS

My research has led to over 30 peer-reviewed papers, including publications in IEEE journals and leading AI conferences such as AAMAS and ECAI, as lead author and collaborator.

- G. Carneiro, **A. Toniolo**, M. Nacenta, and A. J. Quigley. Text vs. graphs in argument analysis. In *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*, 2021.
- Q. Shaheen, **A. Toniolo**, and J. K. F. Bowles. Dialogue games for explaining medication choices. In *Proceedings of the International Joint Conference on Rules and Reasoning*, volume 12173 of *Lecture Notes in Computer Science*, pages 97–111. Springer, 2020. doi:10.1007/978-3-030-57977-7_7.
- G. Carneiro, M. Nacenta, **A. Toniolo**, G. Mendez, and A. J. Quigley. Deb8: A tool for collaborative analysis of video. In *Proceedings of the 2019 ACM International Conference on Interactive Experiences for TV and Online Video, TVX '19*, pages 47–58, New York, NY, USA, 2019. doi:10.1145/3317697.3323358.
- D. Walton, **A. Toniolo**, and T. J. Norman. Dialectical models of deliberation, problem solving and decision making. *Argumentation*, 2019. doi:10.1007/s10503-019-09497-9.
- F. Cerutti, T. J. Norman, **A. Toniolo**, and S. Middleton. Cispaces.org: from fact extraction to report generation information. In *Proceedings of the 7th International Conference on Computational Models of Argument*, 2018.
- G. Ogunniye, **A. Toniolo**, and N. Oren. Meta-argumentation frameworks for multi-party dialogues. In *Proceedings of the 21st International Conference on Principles and Practice of Multi-Agent Systems*, 2018.
- R. W. Ouyang, L. M. Kaplan, **A. Toniolo**, M. Srivastava, and T. J. Norman. Aggregating crowdsourced quantitative claims: Additive and multiplicative models. *IEEE Transactions on Knowledge and Data Engineering*, PP(99), 2016. doi:10.1109/TKDE.2016.2535383.
- R. W. Ouyang, M. Srivastava, **A. Toniolo**, and T. J. Norman. Truth discovery in crowdsourced detection of spatial events. *IEEE Transactions on Knowledge and Data Engineering*, 28(4):1047–1060, 2016. doi:10.1109/TKDE.2015.2504928.

A. Toniolo, D. Braines, A. D. Preece, W. Webberley, T. J. Norman, P. Sullivan, and T. Dropps. Conversational intelligence analysis. In *Proceedings of the First International Workshop on Understanding Situations Through Multimodal Sensing*, pages 42:1–42:6, 2016. doi:10.1145/2833312.2849568.

D. Walton, **A. Toniolo**, and T. J. Norman. Towards a richer model of deliberation dialogue: Closure problem and change of circumstances. *Argument & Computation*, 7(2-3):155–173, 2016. doi:10.3233/AAC-160009.

R. W. Ouyang, L. Kaplan, P. Martin, **A. Toniolo**, M. Srivastava, and T. J. Norman. Debiasing crowdsourced quantitative characteristics in local businesses and services. In *Proceedings of the Fourteenth ACM/IEEE International Conference on Information Processing in Sensor Networks*, pages 190–201, 2015. doi:10.1145/2737095.2737116.

A. Toniolo, T. J. Norman, A. Etuk, F. Cerutti, R. W. Ouyang, M. Srivastava, N. Oren, T. Dropps, J. A. Allen, and P. Sullivan. Supporting reasoning with different types of evidence in intelligence analysis. In *Proceedings of the Fourteenth International Conference on Autonomous Agents and Multiagent Systems*, pages 781–789, 2015.

R. W. Ouyang, M. Srivastava, **A. Toniolo**, and T. J. Norman. Truth discovery in crowdsourced detection of spatial events. In *Proceedings of the Twenty-Third International Conference on Information and Knowledge Management*, pages 461–470, 2014. doi:10.1145/2661829.2662003.

F. Cerutti, **A. Toniolo**, N. Oren, and T. J. Norman. An empirical evaluation of geometric subjective logic operators. In C. I. Chesñevar, E. Onaindia, S. Ossowski, and G. Vouros, editors, *Agreement Technologies*, volume 8068 of *Lecture Notes in Computer Science*, pages 90–104. Springer Berlin Heidelberg, 2013. doi:10.1007/978-3-642-39860-5_8.

A. Toniolo, T. J. Norman, and K. Sycara. An empirical study of argumentation schemes for deliberative dialogue. In *Proceedings of the Twentieth European Conference on Artificial Intelligence*, volume 242, pages 756–761, 2012. Also presented at the Ninth International Workshop on Argumentation in Multi-Agent Systems, 2012. doi:10.3233/978-1-61499-098-7-756.

A. Toniolo, T. J. Norman, and K. Sycara. Argumentation schemes for collaborative planning. In D. Kinny, J. Y. Hsu, G. Governatori, and A. K. Ghose, editors, *Agents in Principle, Agents in Practice*, volume 7047 of *Lecture Notes in Computer Science*, pages 323–335. Springer Berlin Heidelberg, 2011. doi:10.1007/978-3-642-25044-6_26.

TEACHING AND ADMINISTRATION EXPERIENCE

- *Director of Equality, Diversity and Inclusion*, School of Computer Science University of St Andrews, since Aug. 2020.
- *Honours Student Adviser*, University of St Andrews, since Sept. 2017.
- *Member of the School Ethics Committee*, University of St Andrews, since Oct 2016.
- *Associate Fellow of the Higher Education Academy* (UK Professional Standards Framework), since Nov. 2015

2016–2022

Lecturer: Logic and Reasoning, Artificial Intelligence Practice, Software Engineering, and Distributed Systems. Tutor: Object-Oriented Programming, and Java Programming Projects. Supervision of numerous MSc and Honours Software Engineering Projects. Currently co-supervising three PhD students.

2010–2016

Various Demonstrator and Tutor Duties for Undergraduate and Master modules in Computer Science

RECENT GRANTS & PROFESSIONAL ACTIVITIES

- *Principal Investigator*, OCT 19-JUNE 21 “Argumentation-based training for non-expert users of machine learning systems”, Carnegie Research Incentive Grant
- *Principal Investigator*, Dec. 2017-2018, “Don’t make a wave: understanding the dynamics of debate”, Scottish Crucible, Partners: University of Dundee, University of Strathclyde, University of Stirling.
- *Co-Investigator*, June-Nov. 2017, “Human-Machine Teaming for Intelligence Analysis”, DSTL Innovation Accelerator Competition, Partners: University of Southampton, Cardiff University.
- *Programme Committee* member for internationally recognised AI conferences, including IJCAI, ECAI and AAMAS and Computational Argumentation conferences and COMMA.

November 18, 2021