Dr Aditi Shenvi

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RESEARCH INTERESTS

My research interests span applied and methodological Bayesian statistics. I am particularly excited by applications that have the potential to do social good and reduce inequalities such as applications in the domains of public health, environment, and social policy. Methodologically, I am very interested in the development of probabilistic graphical models – in particular, model selection and inference algorithms for these – and the analysis of missingness using graphical methods.

EXPERIENCE

Research Fellow, Applied Statistics & Risk Unit (AS&RU), University of Warwick — Sept 2021 – Present

Teaching Assistant, University of Warwick — Oct 2017 – Nov 2021

- **Statistics:** Professional Practice of Data Analysis (3rd yr UG); Bayesian Statistics & Decision Theory (3rd yr UG, MSc), Stochastic Processes (2nd yr UG); Mathematical Statistics (2nd yr UG); Probability Part A (1st yr UG).
- **Mathematics:** Supervision of 1st yr Mathematics & Statistics UG students.
- **Business school:** Analytics in Practice (MSc); Big Data Analytics (MSc); Quantitative Analysis I & II (1st yr UG); Business Statistics (1st yr UG), Business Analytics (1st yr UG).

EDUCATION

PhD, Mathematics for Real-World Systems CDT, University of Warwick — Sept 2017 – May 2021

- **Thesis**: Non-Stratified Chain Event Graphs: Dynamic Variants, Inference and Applications.
- **Supervisor**: Prof Jim Q. Smith

MSc (Merit), Interdisciplinary Mathematics, University of Warwick — Oct 2016 – Sept 2017

- **Dissertation**: Indicators of Elimination in Simplified Epidemiology Models.
- **Supervisor**: Dr Louise Dyson

BA (Distinction) Mathematics; Minors: Statistics & Economics, University of Mumbai, India — Jun 2012 – Aug 2015

PUBLICATIONS

- Strong P, **Shenvi A**, ..., Smith JQ. (2021) "Building a Bayesian Decision Support System for Evaluating COVID-19 Countermeasure Strategies." To appear in the Journal of Operational Research Society.
- **Shenvi A**, Smith JQ. (2020) "Constructing a Chain Event Graph from a Staged Tree." Proceedings of the Tenth International Conference on Probabilistic Graphical Models.
- **Shenvi A**, Smith JQ, Walton R, Eldridge S. (2019) "Modelling with Non-Stratified Chain Event Graphs." Proceedings of the International Conference on Bayesian Statistics in Action.
- Edwards EA, Caton H, ..., **Shenvi A**, ..., Walton RT. (2018) "Creating a Theoretically Grounded, Gamified Health App: Lessons From Developing the Cigbreak Smoking Cessation Mobile Phone Game." JMIR serious games.

PRE-PRINTS

- **Shenvi A***, Bunnin FO*, Smith JQ. "A Bayesian Decision Support System for Counteracting Activities of Terrorist Groups." arXiv:2007.04410. Submitted to the Royal Statistical Society, Series A.
- **Shenvi A**, Smith JQ. "Propagation for Continuous Time Dynamic Chain Event Graphs." arXiv:2006.15865
- **Shenvi A**, Smith JQ. "A Bayesian Dynamic Graphical Model for Recurrent Events in Public Health." arXiv:1811.08872v2
- Smith JQ, **Shenvi A**. "Assault Crime Dynamic Chain Event Graphs." Warwick Repository

WORKING PAPERS

- **Shenvi A**, Liverani S. "A Mixture Modelling Approach to Model Selection in Chain Event Graphs."
- **Shenvi A***, Walley G*, Strong P, Kobalczyk K, Wilkerson R. "cegpy: A Python Package for Chain Event Graphs." (Code repository: https://github.com/g-walley/cegpy).

FUNDING & AWARDS

- Heilbronn Small Grants Scheme (as PI); £2,250 to supervise an undergraduate research project in summer 2022.
- LMS Early Career Fellowship; £7,000 (Awarded but not accepted due to AS&RU offer).
- EPSRC Mathematical Sciences Research Associate Award; £31,406 (Awarded but not accepted due to AS&RU offer).
- Warwick Chancellor's International 3.5 yr PhD Scholarship, including tuition and maintenance.
- PhD Enrichment Placement Award to work at the Alan Turing Institute, London for 6 months.
- Undergraduate Open Merit Scholarship by the State of Maharashtra, India.

CONFERENCES & WORKSHOPS

- Participant "Turing-Roche Partnership Structured Missingness Workshops" (Virtual), Nov-Dec 2021.
- Invited talk "Continuous Time Dynamic Chain Event Graphs" at Reasoning with asymmetric and context-specific graphs, Baylor University (Virtual), Jul 2021.
- Contributed talk "Constructing a Chain Event Graph from a Staged Tree" at Probabilistic Graphical Models, University of Aalborg (Virtual), Sep 2020.
- Contributed talk "A Bayesian integrated decision support model of criminal collaboration" at Young Statisticians' Meeting, University of Manchester (Virtual), Jul 2020.
- Invited talk "'A Bayesian integrated decision support model of criminal collaboration" at Turing Student Talk Series, the Alan Turing Institute (Virtual), Jul 2020.
- Poster "A dynamic Bayesian model for recurrent events in public health" at Defence & Security international delegates visit, the Alan Turing Institute, May 2019.
- Invited talk "Maximum satisfiability encoding of Chain Event Graphs" at Workshop on Probabilistic Reasoning using Chain Event Graphs, University of Glasgow, Feb 2019.
- Poster "Chain Event Graphs for modelling public health interventions" at Clinical Science & Engineering for Digital Health Workshop, Aston University, Aug 2018.
- Poster "Reduced dynamic Chain Event Graphs", Young Statisticians' Meeting, University of Oxford, Jul 2018.
- Poster "Modelling falls in the elderly: Chain Event Graphs for public health interventions", Bayesian Young Statisticians Meeting (BAYSM), University of Warwick, Jul 2018.

COURSES, STUDY GROUPS & SUMMER SCHOOLS

- Completed the Postgraduate Certificate in Transferable Skills in Science including courses in Postgraduate teaching, Research ethics, and App development, 2017 – 2020.
- Oxford Machine Learning Summer School, Aug 2020.
- Introduction to Deep Neural Networks, and Working with Convolutional Neural Networks workshop at the Alan Turing Institute, Feb 2020.
- Research Software Engineering course at the Alan Turing Institute, Nov 2019.
- The Alan Turing Institute Data Study Group, Dec 2018. Project: PlayerLens – Understanding career paths that deliver success for professional football players and clubs. (Report: http://doi.org/10.5281/zenodo.3558253.)
- Introduction to GPU Programming Summer School, University of Warwick, Jul 2018.

TECHNICAL SKILLS

Programming: Advanced: Python, R; Working knowledge: MATLAB, Mathematica, GPU computing
Tools: LaTeX, Git, Stan, Inkscape, Tableau, Microsoft Office

PROFESSIONAL ACTIVITIES

- PDRA representative in the Welfare, Equality, Diversity & Inclusion Committee at the Statistics Department, University of Warwick, Nov 2021 – Present.
- Reviewer for the Data Study Group reports, the Alan Turing Institute, 2020.

OUTREACH ACTIVITIES

- Panel Member for "Q&A with current PhD students" at the Women in Maths Online Event, University of Warwick, Mar 2021.
- Demonstrator at the Science Gala, University of Warwick, Jan 2019.
- Demonstrator at the Big Bang Fair, Birmingham, Mar 2018.
- Demonstrator for the Institute of Mathematics & its Applications stand, Birmingham, Mar 2017.
- Virtual Mathematics Tutor for a student in Afghanistan, Pax Populi Academy, 2016-17.
- Volunteer to promote educational equality at Warwick Inspire, University of Warwick, 2016-17.
- Teaching volunteer at an after-school centre for the Akanksha Foundation, India, 2015-16.

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