

RAFAL URBANIAK

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EDUCATION AND EXPERIENCE

2022	Bednarowski Trust Fellow, University of Edinburgh
2021	Kosciuszko Foundation Fellow, Northeastern University, Boston
2017-2021	Principal Investigator in a National Science Center project on legal probabilism, University of Gdansk
2012-2019	Postdoctoral Fellow of Research Foundation Flanders
2012	Trinity College Long Room Hub Visiting Fellow, Trinity College Dublin
2011-2012	Visiting Fellow, Benares Hindu University, Varanasi
2009	British Academy Visiting Fellow, Bristol University
2008-	Associate Professor, University of Gdansk (with academic leaves)
2008	PhD in Logic & Philosophy of Mathematics, University of Calgary
2005-2008	TA, research assistant, instructor of record, University of Calgary

SELECTED DATA SCIENCE PROJECTS

- **Legal Probabilism bayesian networks in R**
R implementation of **bayesian network methods** for criminal evidence evaluation, based on our work with Marcello Di Bello on the *Legal Probabilism* entry in the Stanford Encyclopedia of Philosophy
- **Short-term impact of personal attacks on Reddit user activity**
In cooperation with [Samurai Labs](#), we tracked 148,317 users and identified personal attacks among 182,528 posts and comments using their high precision software. I analyzed the data from three perspectives: (i) **classical statistical methods**, (ii) **Bayesian estimation**, and (iii) **model-theoretic analysis with hurdle and zero-inflated models**. They agree: personal attacks decrease the victims' activity.
- **Bayesian estimation of multi-class bias in word2vec embeddings**
We propose **Markov chain Monte Carlo** methods to supersede cosine-distance-based bias measures existing in the literature, and argue that the resulting picture is not as clear as it initially might have seemed.
- **Probabilistic coherence measures over bayesian networks**
Algorithms for calculating main existing coherence measures over bayesian networks, with a new method essentially relying on the causal structure, implemented in R building on `bnlearn`, with application to multiple counterexamples to earlier proposals.
- **Long-term impact of personal attacks on Reddit user activity**
Another cooperation with [Samurai Labs](#). Methods for **multiple time series with covariates** deployed to study the impact of personal attacks on 25k users of Reddit over 10 weeks.
- **MC in backtesting of optimized trading strategies**
Implementation in R of **Monte Carlo methods** for gauging uncertainty in algorithmic trading strategy evaluation. Illustrates how correcting for multiple testing in optimization can undermine claims to significance.

KEY SKILLS

R tasks and tools

- Bayesian statistics
STAN, JAGS, BUGS, rethinking, rjags, runjags, BESTmcmc
- Bayesian networks
`bnlearn`, `gRain`
- Discrete data models
`countreg`, `vcd`, `vcdExtra`, `car`, `MASS`
- Time series, dynamic regression, algo trading
`xts`, `quantmod`, `tidyquant`, `TTR`, `fpp3`
- Data wrangling and visualization
`tidyverse`, `ggplot2`, `ggpubr`

other

- Python
- SQL
- Reproducible research
R markdown, LaTeX, beamer, Shiny
- Datacamp: 24 courses completed
130,102xp, 1,536 exercises aced

ACADEMIC ACTIVITIES

- **Multiple university courses** related to probability, statistics and inference
e.g.: statistical methods in criminology; probability & philosophy of juridical evidence evaluation; Uncertainty and R programming; interpretations of probability; decisions, games, and social choice theory; cognitive failures; meta-arithmetic; formal theories of truth; ontology of mathematics, logic I, logic II
- **3 books and ca. 30 research papers** in top academic journals
e.g.: Stanford Encyclopedia of Philosophy; Aggressive Behavior; Review of Symbolic Logic; Law, Probability & Risk; The International Journal of Evidence & Proof, Journal of Applied Logics, Artificial Intelligence and Law
- **30 invited lectures**
e.g.: University of Oxford, Arizona State University, Bristol University, Paris I Panthéon-Sorbonne, Munich Center for Mathematical Philosophy, University of Edinburgh, University of Quebec, Kyoto University, Keio University, Nagoya University, University of Groningen, University of Gothenburg, Canterbury University, University of Turin
- **13 major research grants and awards**, 15 international conferences organized, referee for 18 journals
- Coordination of [LoPSE research group](#) (4-7 researchers) since 2013