Alan Turing as a Statistician: Breaking the Code by Breaking the Bayesian Egg

Joseph K. Blitzstein, Harvard University

Alan Turing is widely considered the father of computer science. Yet even as an undergraduate he showed a great talent in probability, as discussed by Zabell (1995), and during World War II, he was instrumental in the effort at Bletchley Park to break the German Enigma code. In the process, he made major contributions to Bayesian and empirical Bayesian statistics and to sequential analysis, with his assistant I. J. Good. Some of these contributions are discussed in Good (1979) and Simpson (2010); the latter author is the Simpson of Simpson's Paradox, who was also a code-breaker at Bletchley Park. Recently declassified documents reveal even more of Turing's keen statistical mind. In this talk, we tour Turing's statistical insights, to provide a glimpse into the mind of a brilliant scientist (not just a mathematician) who had prescient views of the relationship between computing and statistics and of the interface between theory and application.

Brief Biography

JOSEPH K. BLITZSTEIN is an Assistant Professor of Statistics at Harvard University, having moved from the Bay Area to the Bay State in 2006 after completing his Ph.D. in Mathematics (with a M.S. in Statistics) at Stanford University, advised by Persi Diaconis. At Harvard, he has taught both undergraduate and graduate probability, along with statistical inference, multivariate analysis, and network analysis. His research in modeling and sampling in networks has led to applications and collaborations spanning a wide range of areas including sociology, ecology, and the spread of epidemics. His upcoming book, written with Carl Morris, takes an "object-oriented" approach in presenting many useful probability tools and ideas for statistics and the sciences.

Blitzstein's undergraduate probability course, Stat 110, has grown to over 200 students from fewer than 80 since he started teaching it in 2006, and has been an extremely popular course at Harvard, even featured on YouTube by students. For his teaching and advising in this and other courses he received the Phi Beta Kappa Teaching Prize in 2009 (awarded to 3 faculty per year Harvard-wide) and has been nominated for the Levenson Award and voted a "favorite professor" in the Harvard yearbook in multiple years. With David Harrington, Blitzstein is Co-Director of Undergraduate Studies in Statistics, overseeing and advising a quintupling in the statistics major, from about 8 to 40 in the last few years. He has also been a key architect of Stat 303: The Art and Practice of Teaching Statistics, a required course for first year Ph.D. students, and of Stat 366: Research Cultivation and Culmination, a workshop course aimed to guide students through the whole process of developing a research idea into a successful publication.

Blitzstein is also a chess expert and serves as faculty adviser to the Harvard Chess Club, for which he traveled with the team to Beijing in 2009 for a match with Peking University.