

DEPARTMENT OF STATISTICS

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Tie-breaker designs

Wednesday, December 1, 2021
11:45 AM EST

Zoom Meeting: Meeting ID: 924 8283 7055
Password: 378160

<https://rutgers.zoom.us/j/92482837055?pwd=TktKVVU2ZlJzZnZQbm1TNUs3K0pmZz09>

Virtual Coffee session before the seminar at 11:30 AM EST

Abstract: In a tie-breaker design, subjects are sorted according to a 'running variable' x . Those at the highest levels get a treatment, those at low levels are in the control group and those in between are randomized to treatment or control. Tie-breakers have been used to assign scholarships to high school students, in order to better measure the effect of the scholarship on educational outcomes. The digital economy opens up many opportunities for companies to use tie-breaker designs in their loyalty programs, to both reward their most loyal customers and measure the causal effect of rewards such as seat upgrades, lounge rights, hotel room upgrades and so on. This talk compares tie-breaker designs to regression discontinuity designs where there is no middle randomization group. The tie-breaker design is more statistically efficient, in a simple two-line regression model as well as in a kernel regression. The statistical efficiency increases monotonically with the amount of experimentation. There is an exploration tradeoff when the treatment is expected to bring greater short-term value for subjects with larger x . The conclusion is that when it is possible (and ethical) to randomize for a group of subjects, it is wise to do so.

Some of this work was done as a paid consultant for Google and was not part of Art Owen's Stanford responsibilities. Some follow-up work was done as a Stanford faculty member.

Bio: Art Owen is a professor in the Department of Statistics at Stanford University. His research interests include empirical likelihood, computer experiments, Monte Carlo especially quasi-Monte Carlo, as well as high dimensional transposable style data sets that come up in bioinformatics and Internet applications. He is best known for inventing empirical likelihood and for work on randomized quasi-Monte Carlo methods. He is also a fellow of the ASA and the IMS. Recently He received the 2021 Senior Noether Prize in nonparametric statistics from the ASA, and 2021 SSC Gold Medal from the Statistical Society of Canada for his fundamental contributions to Statistical Science.

