Abstract: In their legendary WW-II effort to decipher the enigma code, I.J. Good and Alan Turing derived an equally-enigmatic estimator for the probabilities of unlikely and even unseen events. It estimates the probability of events by considering not just the number of times they appeared, but also how many times other, possibly unrelated, events were observed. Though not well understood for over half a century, the Good-Turing estimator has proved invaluable in practice and is used in a variety of applications, including natural-language processing, bioinformatics and ecology. We will review the estimator, its early heuristic explanations, recent rigorous proofs of its efficacy, the best possible performance of any estimator, and some unexpected implications. Based on joint work with Ananda Theertha Suresh and other students.

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12:00-13:00 on Tuesday, January 5, 2016 in the Harry and Carol Saal Auditorium, Alon Building for Hi-Tech (37/202).