



Fairness from Axioms

Rhodes Hall 310: April 24, 2012 @ 1:00PM



ISN Seminar Speaker:
Mung Chiang
Princeton University

◇

Abstract

We present a set of four axioms for fairness measures in resource allocation, and prove that there is a unique family of fairness measures satisfying the axioms. This family is constructed and shown to include α -fairness, Renyi entropy, Jains index, Atkinson index, Jasso index, Foster-Sen function as special cases. Among the engineering implications are a generalized Jains index that tunes the resolution of fairness measure, an interpretation of larger α is more fair in isoelastic utility functions, and a cloud service design with multiple types of resources. We extend the theory to asymmetric fairness measures and fairness-efficiency tradeoff. We also compare with other work of axiomatization in information, economics, and political philosophy.

◇

Biography

Mung Chiang is a Professor of Electrical Engineering at Princeton University, and serves as the Director of Graduate Studies in Electrical Engineering. His research on networking received the 2012 IEEE Kiyo Tomiyasu Award, a 2008 U.S. Presidential Early Career Award for Scientists and Engineers, several young investigator awards, and a few paper awards including the 2012 IEEE INFOCOM Best Paper. He was elected an IEEE Fellow in 2012. His technology transfer resulted in a few commercial adoptions and a 2007 Technology Review TR35 Award, and he founded the Princeton EDGE Lab in 2009. He serves as an IEEE Communications Society Distinguished Lecturer 2012-2013, and wrote an undergraduate textbook “Networked Life: 20 Questions and Answers” to be published in summer 2012.