



THE UNIVERSITY OF
CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

RICK DAVID PRESMAN

Department of Statistics
The University of Chicago

The Cohomology of Irrationality: Perspectives from Topology and
Matrix Factorization

WEDNESDAY, May 13, 2020, at 1:30 PM
ZOOM Meeting, 5747 S. Ellis Avenue

ABSTRACT

The rationality of preferences has been a foundational assumption in economic theory and a frequent flaw in practice. Representation theorems, like the ones given by Debreu, have been used to find conditions under which rational preference relations give rise to global utility functions defined on the entire space of goods. In this thesis, we examine the converse question: how do we quantify the extent to which these assumptions fail? We propose techniques from cohomology theory to measure the obstructions to rationality in these preferences. Bridging theory with practice, we examine how matrix factorizations informed by cohomology can be applied to tangible economic data.