THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

# MASTER'S THESIS PRESENTATION

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## Functional Principal Trade-off Analysis: Universal Approximation via Disc Game Embedding

MONDAY, February 13, 2023, at 2:00 PM
Jones 303, 5747 S. Ellis Avenue

## ABSTRACT

A functional form game is a two player zero-sum game on a trait space which characterizes the trade-offs between two players. In this paper, we present "Functional Principal Trade-off Analysis" (FPTA), a decomposition method that embed games into a sequence of simple "Disc Games" on low dimensional feature space. Their principal trade-offs can be easily visualized on each feature planes. We show that all square integrable games can be decomposed by FPTA and the sequence of feature planes are unique. We also demonstrate that truncation of the sequence of feature planes provides insightful model reduction. Finally, we demonstrate the validity of our model when only samples of agents are provided. We also provide a sufficient sampling rule so that our model yields stable decomposition.