

Area A: Foundations – Individual Behavior under Uncertainty in Dynamic Environments

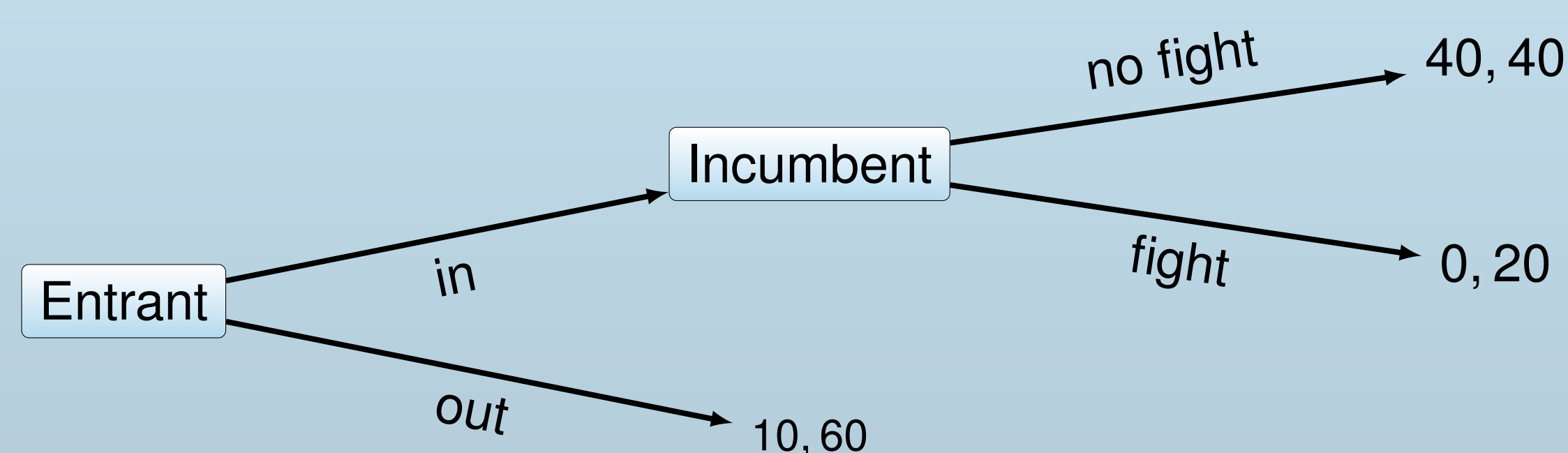
Overview

- Economic interactions comprise individual decisions under uncertainty.
- The long-favored Bayesian approach has shortcomings: (i) Subjective expected utility model fails to account for certain phenomena in individual decision making. (ii) Preferences change over time – consciously or unconsciously. (iii) Agents' decisions are influenced by peers' decisions.
- Need to extend current theory of individual behaviour under uncertainty and in dynamic environments.
- We explore quantification of uncertainty and robustness of optimization under uncertainty, in particular regarding individual behaviour and dynamic influences on preferences.

A1. Stochastic Choice & Learning under Ambiguity

Yves Breitmoser and Frank Riedel

- Logit choice captures stochastic errors in payoff estimation.
- Origin of error unclear in risky/ambiguous environments and games.
- Analyse learning in games with ambiguous types.

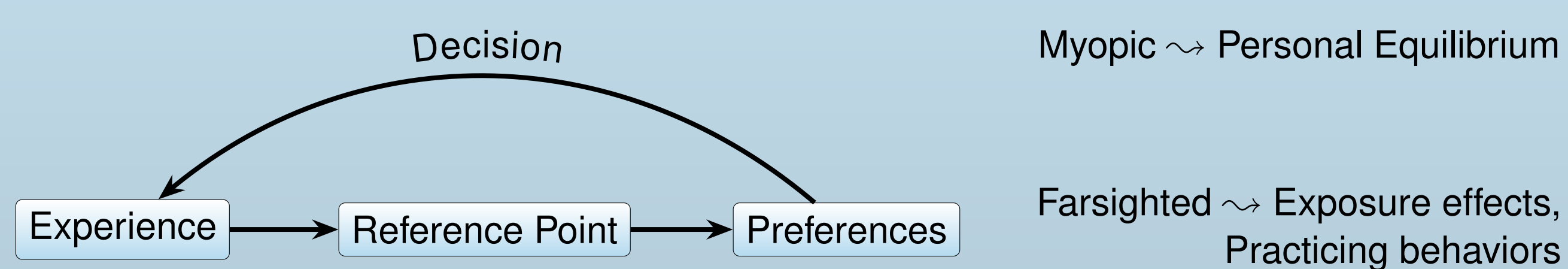


Potential Dissertation Topics. *Stochastic Choice under Risk with Applications to Experimental Data; Stochastic Choice under Ambiguity; Learning under Conditions of Uncertainty*

A2. Preference Uncertainty

Yves Breitmoser and Dominik Karos

- Decision maker understands material outcome, but preferences are unknown or changing.
- Decisions have to be made along the way, to explore and steer preferences.
- Study phenomena like mere exposure effects, brussel sprouts effects and practicing behavior in the presence of ambiguity.

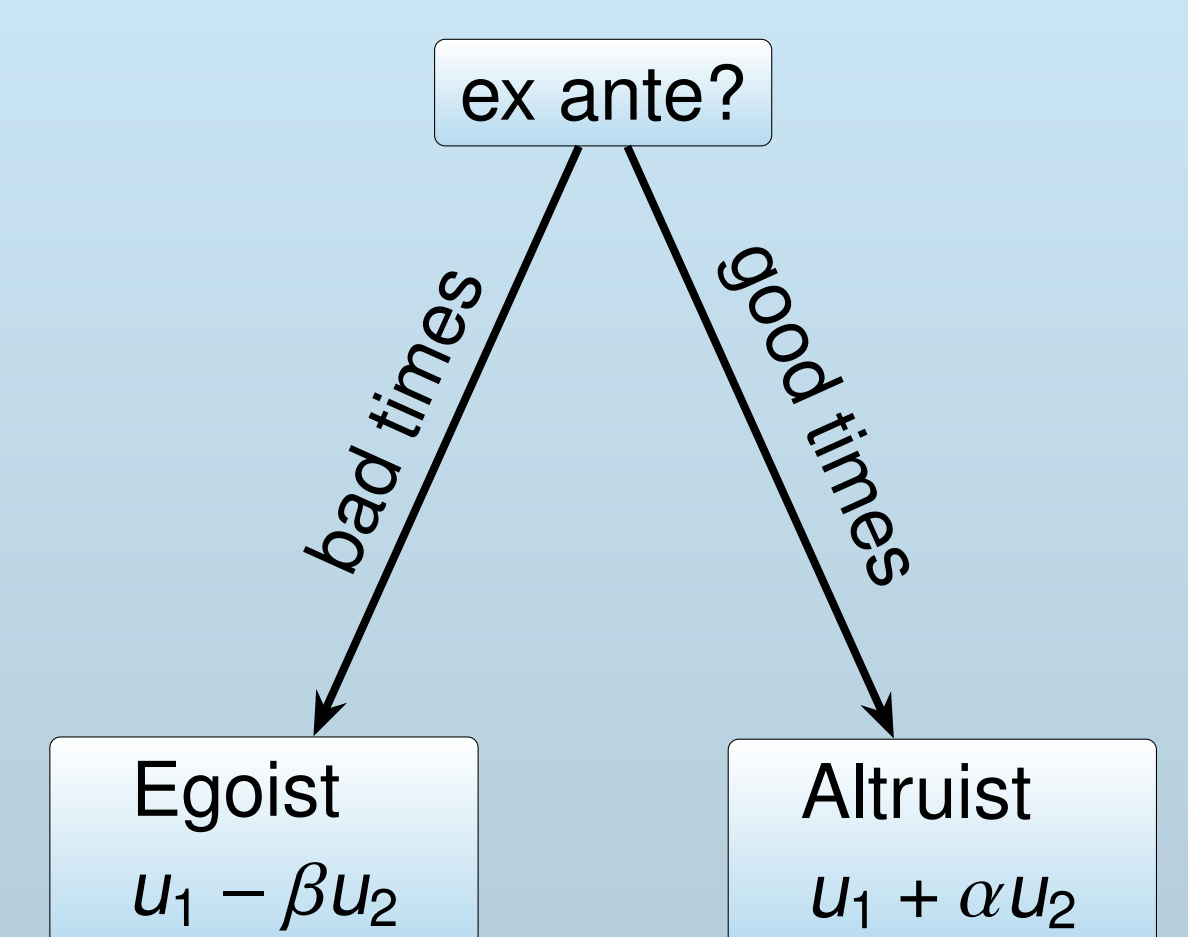


Potential Dissertation Topics. *Decision Making with Unknown Preferences; Learning One's Preferences from Experiments; Ambiguity Aversion in Learning One's Preferences*

A3. Other-Regarding Pref's under Uncertainty

Yves Breitmoser and Frank Riedel

- Provide foundations of other-regarding preferences under uncertainty, including various axioms, e.g. separability, independence, fairness.
- Expected utility indicates ex-post aggregation, fairness indicates ex-ante.
- Study resulting market allocations and welfare theorems.

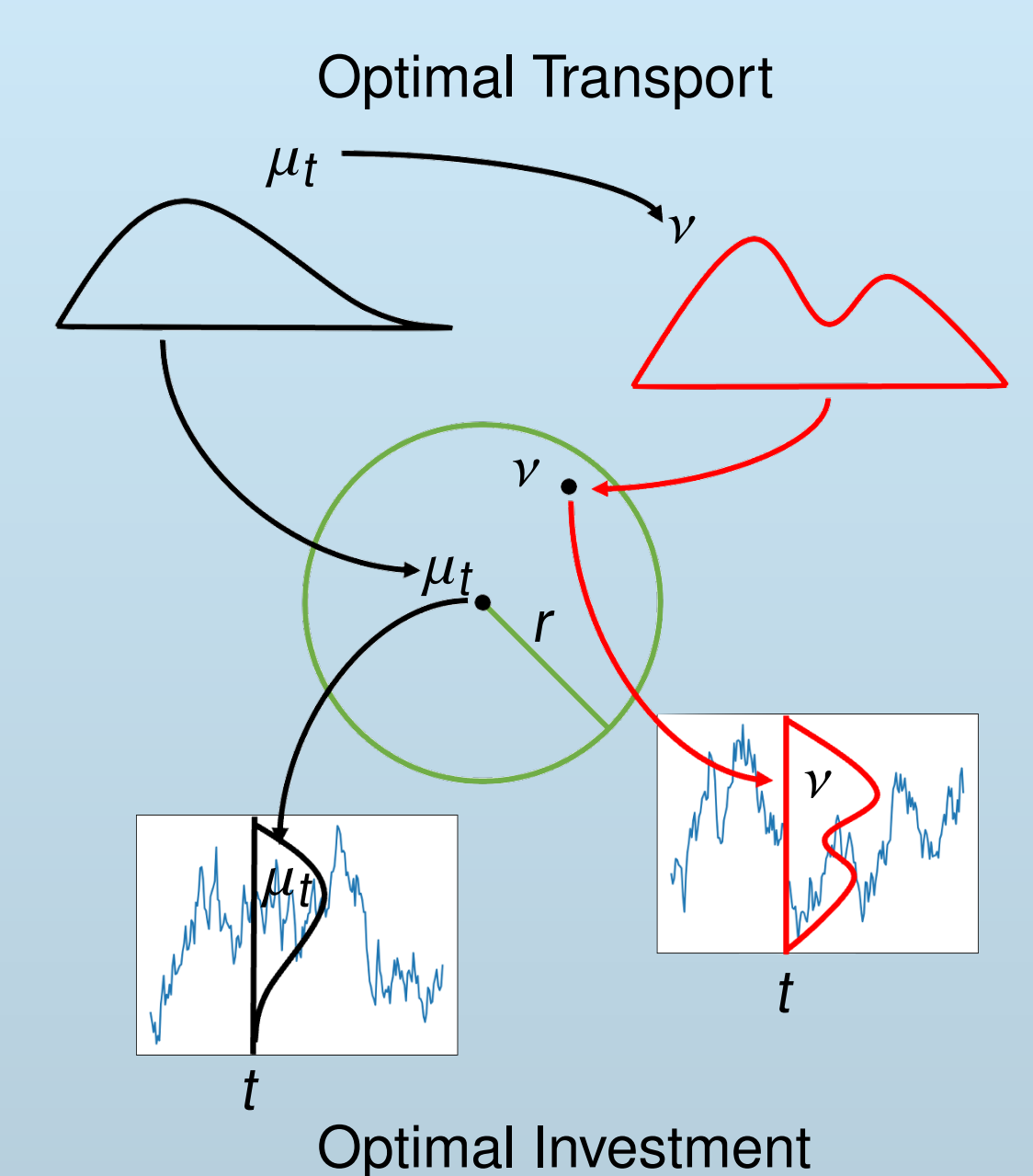


Potential Dissertation Topics. *Separable Other-regarding Preferences under Risk and Uncertainty; Inequity aversion under Uncertainty; Altruism in Dynamic Interactions; Market Effects of Other-Regarding Preferences under Uncertainty*

A4. Dynamic Optimization under Nonparametric Uncertainty

Herbert Dawid and Max Nendel

- Study connection between distributionally robust dynamic optimization problems and related Isaacs equations.
- Characterize optimal solution under worst case considerations.
- Apply results to optimal investment and innovation problems under Knightian uncertainty.

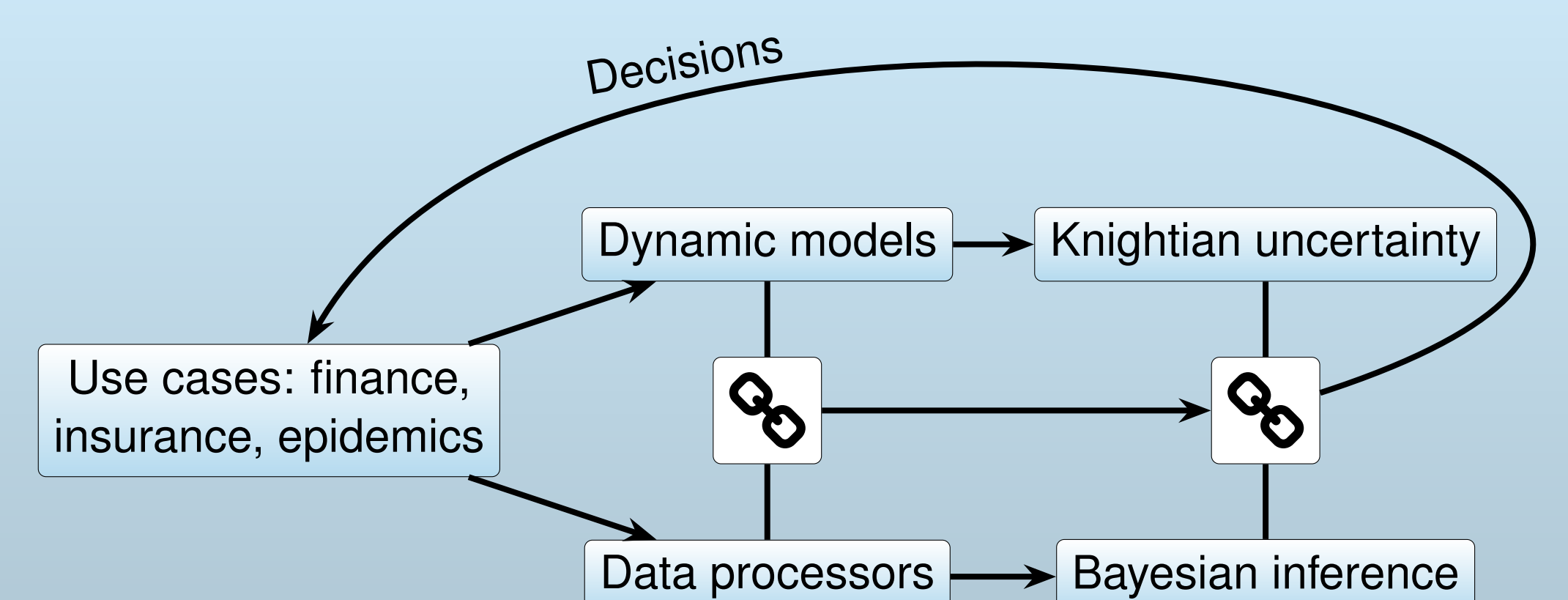


Potential Dissertation Topics. *Numerical and Theoretical Aspects of Wasserstein-robust Optimization; A Game versus Nature: Robust Optimization under Nonparametric Uncertainty; Optimal Entry Deterrence under Uncertainty about Market Evolution; Robust Innovation Strategies*

A5. Uncertainty Quantification & Measurement

Christiane Fuchs, Max Nendel, and Frank Riedel

- Imbalance observed between theoretical foundations and empirical quantification of uncertainty.
- Efficiently approximate marginal distributions which quantify accumulated uncertainty in Bayesian hierarchical models.
- Connect theory of risk measures and Knightian uncertainty with Bayesian inference.



Potential Dissertation Topics. *Uncertainty Quantification and Optimal Portfolio Choice; Bayesian Inference under Knightian Uncertainty; Risk Measures built on Bayesian Analysis*