STOCHASTIC OPTIMIZATION AND RISK CONTROL

Theory • Methods • Applications

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TIME-COHERENT RISK MODELS FOR DYNAMICAL SYSTEMS

- Compare random outcomes in a way consistent with our preferences.
- Devise a policy to achieve a statistically better performance than a moving benchmark.
- Distribution of risk.

STOCHASTIC COMPOSITE OPTIMIZATION

Composite risk functionals

\[
\min_{u \in U} \varrho(u, X) = \mathbb{E}\left[ f_1(u, \mathbb{E}[f_2(u, \mathbb{E}[\ldots f_k(u, \mathbb{E}[f_{k+1}(u, X)], X) \ldots], X], X) \right].
\]

- Estimation Efficiency and Asymptotics
- Bias Reduction
- Numerical methods

MODELS OF RISK IN STATISTICAL LEARNING

- Risk-Sharing in Classification
- Network of Robots
- Sensor placement

RISK-AVERSE OPTIMIZATION IN MEDICAL THERAPY

- Radiation Deliver radiation to malignant tissue without destruction of normal tissue in vital surrounding organs.
- Design of Clinical trials.

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