講演会

講演： **拡散過程に対する階層的リスク回避制御問題について**
On the hierarchical risk-averse control problems for diffusion processes

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場所： 大阪大学 吹田キャンパス情報科学研究科 C 棟 1 階 C101 室 (住所：吹田市山田丘 1–5)

内容： In this talk and its associated work (Befekadu et al. [1,2]), we consider a risk-averse control problem for diffusion processes, in which there is a partition of the admissible control strategy into two decision-making groups (namely, the *leader* and *follower* decision-makers) with different cost functionals and risk-averse satisfactions. Our approach, based on a hierarchical optimization framework, requires that a certain level of risk-averse satisfaction be achieved for the *leader* as a priority over that of the *follower's* risk-averseness. In particular, we formulate such a risk-averse control problem using coupled *forward-backward stochastic differential equations* that allow us to introduce a family of time-consistent dynamic convex risk measures, based on backward-semigroup operators, w.r.t. the strategies of the *leader* and that of the *follower*. Moreover, under suitable conditions, we establish the existence of optimal risk-averse solutions, in the sense of viscosity solutions, to the associated risk-averse dynamic programming equations. Finally, we remark on the implication of our result in assessing the influence of the *leader's* risk-averse satisfaction on the risk-averseness of the *follower* in relation to the direction of *leader-follower* information flow.

[1] G. K. Befekadu, A. Veremyev and E. L. Pasiliao, (2016). *On the hierarchical risk-averse control problems for diffusion processes*. Preprint `arXiv:1603.03359` [math.OC], 20 pages.
[2] G. K. Befekadu, A. Veremyev, V. Boginski and E. L. Pasiliao, (2016). *Remarks on the Stackelberg-Nash risk-averse control problems*. Modeling and Optimization: Theory and Applications Conference, August 17-19, 2016, Bethlehem, PA, USA.

略歴： Getachew K. Befekadu received his Ph.D. degree in electrical engineering (with the DAAD scholarship) from the University of Duisburg - Essen, Germany in 2006. He is currently an NRC/AFRL senior research fellow and affiliated with the Department of Industrial and System Engineering, University of Florida - REEF. He was a research assistant professor/Moreau research fellow at the Department of Electrical Engineering, University of Notre Dame. He was also a postdoctoral research fellow with Lombardi Comprehensive Cancer Center at Georgetown University, Washington, DC. His research interests include robust decentralized/distributed control design for large-scale systems, stochastic optimal control problems, asymptotic problems in dynamical systems with small random perturbations, and application of optimization in large-scale systems.

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