

**第一届控制理论、金融数学与非线性期望
研讨会**

**会
议
手
册**

山东大学金融研究院

2025 年 1 月 3 日-1 月 6 日

目录

一、	会议通知	1
二、	会议日程	2
三、	报告题目、摘要和个人简介.....	4
四、	参会人员	19

一、 会议通知

为了更好地推动控制理论、金融数学、非线性期望及相关学科的发展，促进国内外学者之间的学术交流和人才培养，山东大学和四川大学将于 2025 年 1 月 3-6 日联合举办“第一届控制理论、金融数学与非线性期望研讨会”，本次会议由山东大学中泰证券金融研究院承办。

在此，我们诚挚地邀请您参加此次会议，期待与您在济南相聚！

1. 会议名称及举办单位

会议名称：第一届控制理论、金融数学与非线性期望研讨会

举办单位：山东大学中泰证券金融研究院

会议地点：山东大学中心校区知新楼 B-1238

2. 会议时间安排

2025 年 1 月 3 日	报到
2025 年 1 月 4-5 日	学术报告及交流讨论
2025 年 1 月 6 日	自由讨论及离会

3. 会议联系人

胡明尚 邮箱：humingshang@sdu.edu.cn

王天啸 邮箱：wtxiao2014@scu.edu.cn

二、 会议日程

2025 年 1 月 3 日 报到 2025 年 1 月 6 日 自由讨论及离会		
2025 年 1 月 4 日 学术报告日程		
会场：山东大学中心校区知新楼 B-1238		
时间	报告人	主持人
08:10-08:30	开幕式	陈增敬
08:30-09:30	彭实戈	
09:30-10:30	张旭	
10:30-10:45	茶歇	
10:45-11:45	陈增敬	张 旭
11:45-14:30	午餐	
14:30-15:00	邓 丽	李 娟
15:00-15:30	冯新伟	
15:30-16:00	宋永生	
16:00-16:15	茶歇	
16:15-16:45	柳 絮	嵇少林
16:45-17:15	胡明尚	
17:15-17:45	史敬涛	
17:45-18:15	宋 健	
18:15-20:15	晚餐	

2025 年 1 月 5 日 学术报告日程		
会场：山东大学中心校区知新楼 B-1238		
时间	报告人	主持人
08:30-09:30	吴 臻	吕 琦
09:30-10:30	李 娟	
10:30-10:45	茶歇	
10:45-11:45	吕 琦	吴 臻
11:45-14:30	午餐	
14:30-15:00	张海森	柳 絮
15:00-15:30	王法磊	
15:30-16:00	王鹏辉	
16:00-16:15	茶歇	
16:15-16:45	王天啸	石玉峰
16:45-17:15	吴盼玉	
17:15-17:45	杨淑振	
17:45-18:15	聂天洋	
18:15-20:15	晚餐	

三、 报告题目、摘要和个人简介

题目：深度学习中的非线性数学期望

主讲人：彭实戈

摘要：我们的现实世界正孕育着重大的科学技术变革：基于概率统计理论，特别是在实际样本数据 $i.i.d.$ 假设的基础上，发展出了一批足可以与人类智慧相比美的深度学习算法。而这个方向的进一步的发展正面临着重大的机遇与挑战：实际上，我们这个现实世界存在着深度的被概率统计本身的不确定性，特别是现实世界提供给我们的大批现实数据的深度非线性的 $i.i.d.$ 特征。目前正在冉冉升起的非线性期望理论为我们提供了强大的数学工具。

主讲人简介：彭实戈，中国科学院院士，山东大学教授，山东大学数学与交叉科学研究中心主任。1974年毕业于山东大学物理系，1986年获法国普鲁旺斯大学应用数学博士学位，2005年当选中国科学院院士，2010年受邀在国际数学家大会（ICM）作一小时大会报告，2023年当选为欧洲科学院院士。彭院士长期从事概率论、随机控制和金融数学等科学领域的研究，获得了随机最优控制系统的一般随机最大值原理，主力推动创立了倒向随机微分方程理论。彭院士建立了非线性数学期望的理论，特别是非线性布朗运动的期望和随机分析理论，将Kolmogorov创立的概率论系统的推广到非线性情况，并将其应用于动态金融风险度量与计算。彭院士对我国建立“金融数学”新学科起了关键的作用。

题目：A Convenient Setting for Infinite-Dimensional Analysis

主讲人：张旭

摘要：I will talk about a convenient framework that we proposed for infinite-dimensional analysis, in which differentiation (in some weak sense) and integration operations can be easily performed, integration by parts can be conveniently established under rather weak conditions, and especially some nice properties and consequences obtained by convolution in Euclidean spaces can be

extended to infinite-dimensional spaces in some sense by taking the limit. Compared to the existing tools in infinite-dimensional analysis, our setting enjoys more convenient and clearer links with that of finite dimensions, and hence it is more suitable for computation and studying some analysis problems in infinite-dimensional spaces.

主讲人简介：张旭，四川大学教授，研究领域为控制论与无限维分析，主要工作发表在 SIAM Rev.、Comm. Pure Appl. Math.、Annu. Rev. Control、J. Eur. Math. Soc. 和 Mem. Amer. Math. Soc. 等刊，并在 Springer 出版专著 3 部。他曾获国家自然科学基金二等奖（2013 年，唯一完成人）和美国工业与应用数学学会 SIGEST 论文奖，获国家杰出青年科学基金和国家自然科学基金重点项目等资助，入选全国模范教师、教育部重要人才计划、国家高层次人才特殊支持计划领军人才、四川省“天府万人计划”天府杰出科学家、教育部“创新团队发展计划”、中国科学院“百人计划”、“十一五”期间《国家自然科学基金资助项目优秀成果选编》和《国家杰出青年科学基金二十周年巡礼》等，先后担任控制领域顶刊 SIAM J. Control Optim. 等 10 余份国际学术杂志的编委、副主编或主编，并应邀在 2010 年国际数学家大会作 45 分钟报告。

题目：Proof of a Conjecture about Parrondo Paradox for Two-Armed Slot Machines

主讲人：陈增敬

摘要：The 1936 Mills Futurity slot machine had the feature that, if a player loses 10 times in a row, the 10 lost coins are returned. Ethier and Lee (2010) studied a generalized version of this machine, with 10 replaced by deterministic parameter J . They established the Parrondo effect for a hypothetical two-armed machine with the Futurity award. Specifically, arm A and arm B , played individually, are asymptotically fair, but when alternated randomly (the so-called random mixture strategy), the casino makes money in the long run. They also considered the nonrandom periodic pattern strategy for patterns with r A s and s B s (e.g., $ABABB$ if $r = 2$ and $s = 3$). They established the Parrondo effect if $r + s$ divides

J , and conjectured it in four other situations, including the case $J = 2$ with $r \geq 1$ and $s \geq 1$. We prove the conjecture in the latter case.

主讲人简介：陈增敬，山东大学教授，山东大学中泰证券金融研究院院长；国家杰出青年科学基金获得者。主要从事金融数学、倒向随机微分方程、非线性期望、计量经济学等领域的研究，先后在 *Econometrica*、*Journal of economic theory*、*Annals of probability*、*Automatica* 和 *Nature* 子刊等期刊发表论文 80 余篇。在量子和非独立的框架下，给出了一类非线性正态分布分布密度的显示表达式。丰富和完善了彭实戈院士的非线性期望理论，应用到金融领域，解决了资产定价领域中一些长期未解决的难题，在国内外产生了重要的影响。其中，与美国艺术与科学院士、著名经济学家 Epstein 合作发现了动态多先验资产定价理论与非线性 g -期望之间的联系，得到了被称为 Chen-Epstein 的定价公式。该结果被诺贝尔经济奖获得者、国际数学家（ICM）报告人以及多位国际著名学者和专家引用或推广。曾先后获得第十四届孙冶方经济科学奖、国家自然科学二等奖和“五一”劳动奖章等诸多奖项。目前正在主持国家重点研发项目一项、山东省自然科学基金重大基础研究项目一项；曾主持国家自然科学基金重点项目一项。

题目：The Maximum Principle for Discrete-Time Stochastic Control Problems

主讲人：吴臻

摘要：In this talk, we focus on discrete-time stochastic optimal control problems, discussing key developments in both convex and non-convex control domains. We begin by addressing the problem within convex control domains, deriving necessary and sufficient stochastic maximum principle. We then extend these results to discrete-time mean-field type stochastic optimal control problems with convex control domains. For these, an adjoint operator technique is employed to overcome the difficulties of establishing adjoint equations and duality relations. Next, we introduce the discrete-time stochastic maximum principle for delayed systems. This result not only extends the method developed for mean-field systems but also integrates these advancements into a broader, unified framework. Finally, we consider non-convex control domains. For this challenging case, we introduce a

novel approach, inspired by the classical spike variation in continuous-time cases, but adapted for discrete-time settings through random scale perturbations instead of time scale. This method enables us to derive the maximum principle recursively, eliminating the need for variational equations or adjoint equations. This extends previous results obtained in convex control domains. The goal of this talk is to establish a rigorous and comprehensive framework for the discrete-time stochastic maximum principle, offering insights into convex and non-convex domains, and paving the way for further research. The talk is based on the works of Z. Wu, F. Zhang, MCRF, 2022, B. Dong, T. Nie, Z. Wu, Automatica, 2022, B. Dong, T. Nie, Z. Wu, SCL, 2023, and Y. Song, Z. Wu, Automatica, 2024.

主讲人简介: 吴臻, 山东大学数学学院教授, 教育部“长江学者”特聘教授, 国家杰出青年基金获得者, 泰山学者攀登计划专家。现任山东大学常务副校长兼数学学院院长, 中国数学会副理事长, 国家自然科学基金委员会数理学部第九届专家咨询委员会委员, 教育部大学数学教学指导委员会委员, 山东数学会理事长, 研究领域涉及控制论、概率论和金融数学等, 取得了一系列具有突破性和原创性的科研成果, 曾任国际控制理论权威期刊 SIAM J. Control Optim. 编委, 现任国家基金委英文期刊 Fundamental Research 数学物理领域编委, SCI 学术期刊 ESAIM-Control Optim. Calc. Var.、Statist. Probab. Lett.、国际学术期刊 Probab. Uncertain. Quant. Risk 和 Part. Diff.Equa. Appl. 编委。曾获中国数学会第十七届陈省身数学奖, 首位获山东省自然科学奖一等奖, 作为主要完成人 5 次获得国家教学成果奖, 获首届国家优秀教材二等奖, 2 次获山东省教学成果特等奖。主持国家重点研发计划项目、国家基金委重点项目、山东省重大基础研究项目等。为国家“万人计划”首批科技创新领军人才入选者和科技部首批国家创新人才推进计划“金融数学”重点领域创新团队负责人, 入选国家百千万人才工程并获得“有突出贡献中青年专家”荣誉称号, 享受国务院政府特殊津贴。

题目：Optimal Control Problems with Generalized Mean-Field Dynamics and Viscosity Solution to Master Bellman Equation

主讲人：李娟

摘要：We study an optimal control problem of generalized mean-field dynamics with open-loop controls, where the coefficients depend not only on the state processes and controls, but also on the joint law of them. The value function V defined in a conventional way, but it does not satisfy the Dynamic Programming Principle (DPP for short). For this reason we introduce subtly a novel value function ϑ , which is closely related to the original value function V , such that, a description of ϑ , as a solution of a partial differential equation (PDE), also characterizes V . We establish the DPP for ϑ . By using an intrinsic notion of viscosity solutions, initially introduced in Burzoni, Ignazio, Reppen and Soner (2020) and specifically tailored to our framework, we show that the value function ϑ is a viscosity solution to a Master Bellman equation on a subset of Wasserstein space of probability measures. The uniqueness of viscosity solution is proved for coefficients which depend on the time and the joint law of the control process and the controlled process. Our approach is inspired by Buckdahn, Li, Peng and Rainer (2017), and leads to a generalization of the mean-field PDE to a Master Bellman equation in the case of controls. Based on a joint work with Rainer Buckdahn (UBO, France) and Zhanxin Li (SDU, Weihai).

主讲人简介：李娟，山东大学特聘教授，教育部长江学者特聘教授，硕士生、博士生导师。主要研究方向为随机分析、随机控制、随机微分博弈等。

题目：Inverse Problems of Stochastic Partial Differential Equations: Some Recent Progresses

主讲人：吕琦

摘要：In this talk, I will present some recent progresses on inverse problems of stochastic partial equations. We focus on the two typical equation, i.e., stochastic parabolic equations and stochastic hyperbolic equations. The key tool to solve these inverse problems are Carleman estimate.

主讲人简介：吕琦，四川大学教授，主要研究偏微分方程和随机微分方程的控制理论。主要成果发表在 *Comm. Pure Appl. Math.*, *J. Euro. Math. Soc.*、*J. Math. Pure. Appl.*、*SIAM J. Control Optim.* *J. Funct. Anal.* 等刊物上，在 Springer-Verlag 出版专著三部。获国家杰出青年基金资助，曾入选教育部重要人才计划青年学者，获中国数学会钟家庆奖，中国工业与应用数学学会应用数学青年科技奖、霍英东教育基金会高等院校“青年牛科学奖”，以及四川省“两优一先”高校优秀共产党员称号；先后担任 *SIAM J. Control Optim.*, *ESAIM: Control, Optim. Calc. Var.* 等刊物的编委，并应邀在 2022 年国际数学家大会作 45 分钟报告。

题目：Necessary Optimality Conditions for Optimal Control Problems Evolved on Riemannian Manifolds

主讲人：邓丽

摘要：In this talk, we study the optimal control problem for control systems described by ordinary differential equations on Riemannian manifolds. Specifically, the state of the control system is subject to both equality and inequality constraints at the terminal time, while the pointwise control constraint set is convex. We establish the second-order necessary conditions for optimal controls. As an application of our results, we explore an optimal control problem involving ordinary differential equations with pointwise state constraints.

主讲人简介：邓丽，西南交通大学副教授，博导。她主要从事黎曼流形上的控制问题的研究，代表性成果发表在 *Journal of Differential Equations*, *SIAM Journal on Control and Optimization*, *ESAIM: Control, Optimization and Calculus of Variations* 等期刊上，主持国家自然科学基金面上项目一项。

题目：Stackelberg Equilibrium with Social Optima in Linear-Quadratic-Gaussian Mean-Field System

主讲人：冯新伟

摘要：A linear quadratic social optima problem with a leader and a large number of weakly coupled followers is investigated. To be specific, the followers cooperate to minimize the social cost after the leader first announces his/her strategy, while the leader will then optimize his/her own cost functional on consideration of the followers' reactions. We assume that the controls are involved in both the followers' and the leader's state equations. Meanwhile, the followers' average control and average state terms enter into the drift coefficient of the leader's state equation. In order to obtain the asymptotic optimal strategies, two corresponding auxiliary problems are present using variational and person-by-person technologies. Furthermore, we construct the decentralized strategies of this leader-follower system by virtue of a solvable consistency system. Eventually, the corresponding asymptotic Stackelberg equilibrium is demonstrated rigorously.

主讲人简介：冯新伟，教授，山东大学齐鲁青年学者，主要从事倒向随机微分方程及其应用、非线性期望等方向的研究，在《The Annals of Applied Probability》，《SIAM Journal on Control and Optimization》、《IEEE Transactions on Automatic Control》、《Science China Mathematics》等期刊发表论文 30 余篇，主持了国家自然科学基金面上项目、青年项目以及山东省自然科学基金青年项目，以骨干成员参加了国家自然科学基金重点项目、天元基金重点专项以及科技部重点研发项目，2022 年起担任中国工业与应用数学学会金融数学与工程和精算保险专业委员会委员。

题目：Invariant Sublinear Expectations

主讲人：宋永生

摘要：We first give a decomposition for invariant sublinear expectations, and show that each component of the decomposition has a finite period. Then we prove that a continuous invariant sublinear expectation that is strongly ergodic has a finite period

pE , and that the component of its periodic decomposition with period p is the convex hull of a finite set of T^p -ergodic probabilities. As an application of the characterization, we prove an ergodicity result which shows that the limit of the pE -step time means achieves the upper expectation.

主讲人简介：宋永生，中国科学院数学与系统科学研究院研究员。2008 年博士毕业于研究院，并在研究院工作至今。主要研究方向为非线性期望理论及其应用，包括非线性期望下随机过程的性质、倒向随机微分方程、以及非线性期望下的极限理论等。

题 目：Finite Codimensionality Method for Infinite-Dimensional Optimization Problems

主讲人：柳絮

摘要：This talk is devoted to establishing a Fritz John type first-order necessary condition for constrained nonlinear infinite-dimensional optimization problems. Unlike traditional constraint qualifications in optimization theory, a condition of finite codimensionality is employed to ensure the existence of nontrivial Lagrange multipliers. As applications, first-order necessary conditions for some optimal control problems are derived in a unified manner. Moreover, the finite codimensionality condition offers a more straightforward verification process in these applications. This is a joint work with Qi Lü, Haisen Zhang and Xu Zhang.

主讲人简介：柳絮，东北师范大学数学与统计学院教授、博士生导师，国家重点研发计划项目负责人，主要研究确定性与随机分布参数系统控制理论，曾获教育部自然科学奖二等奖。

题目：Maximum Principle for Stochastic Optimal Control Problem under Convex Expectation

主讲人：胡明尚

摘要：we study a stochastic optimal control problem under a type of consistent convex expectation dominated by G -expectation. By the separation theorem for convex sets, we get the representation theorems for this convex expectation and conditional convex expectation. Based on these results, we obtain the variational equation for cost functional by weak convergence and discretization methods. Furthermore, we establish the maximum principle which is sufficient under usual convex assumptions. Finally, we study the linear quadratic control problem by using the obtained maximum principle. This is a joint work with Xiaojuan Li.

主讲人简介：胡明尚，山东大学中泰证券金融研究院教授，博士生导师，山东省泰山学者青年专家。主要研究方向为非线性期望、倒向随机微分方程、随机控制、金融数学等。在 Transactions of the American Mathematical Society, SIAM Journal on Control and Optimization, Stochastic Processes and their Applications, Journal of Differential Equations 等杂志发表论文 30 余篇。近年来，主持国家自然科学基金数学天元基金重点专项 1 项，主持完成国家自然科学基金面上项目 1 项。

题目：A General Maximum Principle for Optimal Control of Stochastic Differential Delay Systems

主讲人：史敬涛

摘要：This talk is concerned with a general maximum principle for a stochastic optimal control problem, where the control domain is an arbitrary non-empty set and all the coefficients (especially the diffusion term and the terminal cost) contain the control and state delay. This topic is a long standing open problem. In order to overcome the difficulty of dealing with the cross term of state and its delay in the variational inequality, we propose a new method: transform a delayed variational equation into a Volterra integral equation without delay, and introduce novel

first-order, second-order adjoint equations via the backward stochastic Volterra integral equation (BSVIE) theory. Finally we express these two kinds of adjoint equations in more compact anticipated backward stochastic differential equation (ABSDE) types for several special yet typical control systems. Our result generalizes the famous Peng's general stochastic maximum principle to the case with time delay. Joint work with Dr. Weijun Meng (AMSS, CAS), Prof. Tianxiao Wang (Sichuan University) and Prof. Jifeng Zhang (AMSS, CAS).

主讲人简介：史敬涛，山东大学数学学院教授、博士生导师，概率论与数理统计研究所所长。主要从事随机控制与微分博弈、正倒向随机系统、时滞随机系统与金融数学等方面的研究。曾赴美国中佛罗里达大学、澳大利亚阿德莱德大学和新南威尔士大学、香港理工大学、澳门大学等国家和地区高校访问交流。目前在 SIAM Journal on Control and Optimization、IEEE Transactions on Automatic Control、Automatica 等国际权威学术期刊发表论文 40 余篇，曾获山东省自然科学二等奖、张嗣瀛 (CCDC) 优秀青年论文奖、中国科协期刊优秀学术论文奖等，目前主持国家自然科学基金面上项目、国家重点研发计划数学和应用研究重点专项课题。现为中国自动化学会控制论专业委员会 (TCCT) 随机系统控制专题研讨会程序委员会委员。

题目：Backward Stochastic Differential Equations with Nonlinear Young Driver

主讲人：宋健

摘要：We consider backward stochastic differential equations (BSDEs) with a nonlinear Young integral where the driver is a space-time Holder continuous function. Solutions to such equations provide a probabilistic interpretation of the solutions to stochastic partial differential equations (SPDEs) driven by space-time noise. As an application, nonlinear Feynman-Kac formulae for a class of partial differential equations with Young drivers (Young PDEs) is derived.

主讲人简介：宋健，2010 美国堪萨斯大学博士，2010-2012 美国 Rutgers 大学助理教授，2013-2018 香港大学助理教授，2018 至今山东大学教授。主要研究方向为随机偏微分方程、统计物理模型、随机矩阵以及随机控制等。

题目：Some Modified Progressive Hedging Algorithm for Multi-stage Stochastic Variational Inequality Problems

主讲人：张海森

摘要：Some modified progressive hedging algorithms (PHAs) are proposed for solving multi-stage stochastic variational inequalities in general probability space. The subproblems in those algorithms are allowed to be calculated inexactly. It is proved that the modified PHAs have a closed relation with some modified proximal point algorithms (PHAs). The strong convergence of those algorithms are proved under some appropriate conditions. The numerical examples are given to indicate the efficiency of those algorithms.

主讲人简介：张海森，四川师范大学教授，博士生导师，四川省“千人计划”特聘专家，霍英东青年教师奖获得者。主要研究领域为随机优化与随机最优控制，在 SIAM Review, Trans. Amer. Math. Soc., SIAM J. Control Optim., J. Differential Equations 等期刊发表论文近二十篇。主持和参与国家自然科学基金项目多项。现任中国运筹学会数学规划分会理事；中国工业与应用数学会系统与控制数学专委会委员。

题目：On Averaging Principle for G -SDEs with Two Time-Scales

主讲人：王法磊

摘要：In this talk, we prove a convergence theorem for singular perturbations problems for a class of fully nonlinear parabolic partial differential equations (PDEs) with ergodic structures. The limit function is represented as the viscosity solution to a fully nonlinear degenerate PDEs. Our approach is mainly based on G -stochastic analysis argument. As a byproduct, we also establish the averaging principle for stochastic differential equations driven by G -Brownian motion with two time-scales. The results extend Khasminskii's averaging principle to nonlinear case.

主讲人简介：王法磊主要从事倒向随机微分方程、非线性数学期望及其应用的研究，曾获山东省优秀青年基金，主持国家自然科学基金项目多项。在 Stochastic

Processes and their Application、Electronic Journal Of Probability, SIAM Journal on Control and Optimization 等随机分析与随机控制等领域学术期刊上发表论文二十余篇。

题目：Optimal Control Problem in Quantum Stochastic Systems in Fermion Fields

主讲人：王鹏辉

摘要：In the present talk, I will introduced some recent development on the optimal control of quantum stochastic systems. Such a quantum stochastic system is an noncommutative analogue of stochastic differential equations, and the well-definedness of L^p solution is based on the BG inequality obtained by Pisier and Xu. By using dynamic programming principle, the optimal control problem was studied when the drift term has no control. An in this talk, we will introduced the Pontryagin maximal principle of such a controlled quantum stochastic system with control in the drift term. The talk is based on the joint work with S.Wang.

主讲人简介：王鹏辉, 山东大学数学学院教授, 博士生导师。在 Hilbert 模的几何分析、Hamilton 系统的特征值问题等方面做出大量工作。首先, 完全解决多圆盘版本的 Arveson 猜想; 其次, 建立 Hamilton 系统的 Hill-型公式和 Krein-型迹公式, 得到平面三体问题稳定区域的首个理论估计。最近主要关注量子随机微分方程的控制问题。

题目：Maximum Principle for Stochastic Volterra System and Applications

主讲人：王天啸

摘要：In this lecture, we will discuss the maximum principle for optimal control problems of stochastic Volterra integral equations when the control domain is arbitrary non-empty set and diffusion is control dependent. Second-order adjoint equations in terms of systems of backward stochastic Volterra integral equations are introduced and carefully discussed. As an application, we study the analogue problem for stochastic delay differential equations. This lecture includes two joint

works with Weijun Meng, Jingtao Shi, Jiongmin Yong and Jifeng Zhang.

主讲人简介：王天啸，四川大学(正高)研究员，博士生导师，入选国家级青年人才计划。从事随机最优控制理论等方面研究，相关成果发表在《J. Math. Pure. Appl.》，《SIAM J. Control Optim.》等期刊，主持 3 项国家自然科学基金项目，参与 1 项自然科学基金重点项目，现任 SCI 期刊《Adv. Cont. Disc. Model》，《Math. Control Related Fields》编委。

题目：Optimal State Equation for the Control with Two Distinct Dynamic Systems

主讲人：吴盼玉

摘要：We consider a class of stochastic control problems which have been widely used in optimal foraging theory and financial modeling. The optimal state process has two distinct dynamics, characterized by two pairs of drift and diffusion coefficients, depending on whether it takes values bigger or smaller than a threshold value. Adopting a perturbation type approach, we find an expression for potential measure of the optimal state process. We then obtain an expression for the transition density of the optimal state process by inverting the associated Laplace transform. Properties including the stationary distribution of the optimal state process are discussed. Finally, the expression of the value function is given for such stochastic control problems.

主讲人简介：吴盼玉，山东大学金融研究院教授，硕士生导师，2020 年入选山东大学青年学者未来计划。主要从事非线性概率与期望、倒向随机微分方程理论及应用、金融数学等领域的研究。在 Stoch. Proc. Appl., Automatica, Sci. China Math. 等国内外知名期刊上发表学术论文近二十篇。主持国家自然科学基金、山东省自然科学基金、博士后基金等多项科研项目，作为骨干成员参加国家重点研发计划以及山东省自然科学基金重大基础研究项目。曾获山东省高等学校科学技术奖二等奖。

题目：Value at Risk Model under Sublinear Expectation

主讲人：杨淑振

摘要：In this report, we review the value at risk (VaR) model under sublinear expectation. We first consider the classical VaR model, and then introduce the basic concepts under sublinear expectation. Based on sublinear expectation, we show the definition of the VaR under model uncertainty, which is called G -VaR. Furthermore, we present three methods for estimating the parameters of the G -VaR model. Those are the long-time average method, the first-order autoregressive method, and the adapted learning method. In the end, we use SP500 index to verify the performance of G -VaR model.

主讲人简介：杨淑振，山东大学金融研究院教授，博士生导师，山东省泰山学者青年专家。主要从事非线性期望和随机最优控制问题的研究，以及控制、金融数学和经济的交叉科学研究。在《Journal of Financial Econometrics》，《Journal of Mathematical Economics》，《经济研究》，《SIAM: Theory Probab. Appl.》，《ESAIM: COCV》，《Systems & Control Letters》等金融计量、经济金融和随机最优控制领域期刊发表论文。

题目：Indefinite Linear Quadratic Large Population Problem with Partial Observation

主讲人：聂天洋

摘要：We investigate an indefinite linear-quadratic partially observed large population system with common noise, where both the state-average and control-average are considered. All weighting matrices in the cost functional can be indefinite. We obtain the decentralized optimal strategies by the Hamiltonian approach and demonstrate the well-posedness of Hamiltonian system by virtue of relaxed compensator. The related Consistency Condition and the feedback form of decentralized optimal strategies are derived. Moreover, we prove that the decentralized optimal strategies are ε -Nash equilibrium by using the relaxed compensator. The talk is based on the joint work with Dr. Tian Chen and Prof. Zhen Wu.

主讲人简介：聂天洋，山东大学数学学院教授，副院长。研究方向为倒向随机微分方程、随机控制、金融数学。主持国家基金委优秀青年基金、国家重点研发计划课题等项目。曾获山东省自然科学奖、山东省青年科技奖等。

四、 参会人员

序号	姓名	单位
1	陈增敬	山东大学
2	邓丽	西南交通大学
3	冯新伟	山东大学
4	韩慧敏	山东大学
5	韩月才	吉林大学
6	胡明尚	山东大学
7	嵇少林	山东大学
8	姜恋姿	山东科技大学
9	李邯武	山东大学
10	李娟	山东大学
11	李仁兴	山东大学
12	李小娟	齐鲁师范学院
13	李欣鹏	山东大学
14	李运章	复旦大学
15	廖中华	四川大学
16	林一青	上海交通大学
17	刘国民	南开大学
18	柳絮	东北师范大学
19	罗鹏	上海交通大学
20	吕琦	四川大学
21	马博文	成都理工大学
22	聂天洋	山东大学
23	彭实戈	山东大学
24	石玉峰	山东大学
25	史敬涛	山东大学
26	宋健	山东大学
27	宋永生	中国科学院
28	王法磊	山东大学
29	王寒霄	深圳大学
30	王鹏辉	山东大学
31	王天啸	四川大学
32	王宇	西南交通大学

33	温家强	南方科技大学
34	吴凡	安徽大学
35	吴盼玉	山东大学
36	吴臻	山东大学
37	杨淑振	山东大学
38	杨舟	华南师范大学
39	于琛瑶	山东大学
40	张德飞	红河学院
41	张海森	四川师范大学
42	张静	复旦大学
43	张旭	四川大学
44	赵炳儒	山东大学
45	赵清梅	四川师范大学