

学术报告会

时 间：2021年4月25日(周日) 9:30-11:30

地 点：电院群楼2-406会议室

邀请人：王琳

程代展

中科院数学与系统科学研究院



报告一 超复数代数的矩阵半张量积方法 STP Approach to Hypercomplex Algebra

Abstract: Hypercomplex number is a generalization of complex number, which has several successful applications to signal processing, image coding/decoding, design of neural network, analysis of differential operators, or even in general relativity. This talk proposes a special kind of hypercomplex numbers, called perfect hypercomplex algebra (PHA). Using semi-tensor product of matrices, necessary and sufficient conditions are obtained for verifying whether a set of hypercomplex numbers is a PHA. Then PHA of lower dimensions ($n=2,3,4$) are investigated one by one. Zero set is firstly defined to characterize the set of non-invertible elements. Then the perfect hypercomplex matrix (PHM) are proposed, some interesting properties are revealed. Lie group and Lie algebra of PHM are also explored.

报告二 有限博弈的矩阵半张量积方法 STP Approach to Finite Games

Abstract: Starting from fundamental concepts about finite games, the modeling and control of networked evolutionary games via semi-tensor product, are introduced. Then the Bayesian game, as incomplete information game, is also discussed, and various conversions are presented.

Then the talk will concentrate on potential game. Potential equation is introduced. Based on potential game, the vector space structure of finite games with orthogonal subspace decomposition is presented. Recent development on weighted potential game (WPG) is then introduced. The technique to verify whether a given finite game is a WPG without knowledge about weights is proposed. Finally, the application of above results to game theoretic control is introduced.

Biography:

程代展，1946年3月生。清华大学毕业（1964-1970），中科院研究生院硕士（1978-1981），美国华盛顿大学博士（1981-1985）。现为中国科学院数学与系统科学研究院研究员，国际电气与电子工程师协会会员（IEEE Fellow），国际自动控制联合会会士（IFAC Fellow），中国自动化学会首届会士，曾任IFAC理事（2011-2014）及IEEE CSS执委（2010和2015），中国自动化学会控制理论专业委员会主任（2003-2010）。曾获国家自然科学二等奖两次（2008、2014，均为第一完成人），IFAC颁发的其旗舰杂志Automatica 2008-2011最佳论文奖（为迄今唯一华人学者完成的获奖论文），中国科学院个人杰出成就奖（金质奖章）。此外，还获得省部级一等奖两次、二等奖四次、三等奖一次。出版学术论著17本，期刊论文300余篇，其他书籍3本。