网络与大数据应用课程详细信息

课程号	04834060	**学分**	2
英文名称	Networking for big data applications		
先修课程	高等数学，大学英语，编程（MATLAB or Python）		
中文简介	本课程旨在学习大数据应用相关的网络和信号处理技术，即一系列用于理解与解释大数据信息的计算与分析技术。本课程专注于各种大数据理论与技术（机器学习，网络，能源系统），以及他们在工业界的实际应用。本课程第一个目标是介绍大数据技术范式，第二个目标是全面学习和掌握大数据处理的关键技术，第三个目标是了解前沿的大数据应用。		
英文简介	In this course, we plan to address the challenges from the management of the big data, through the lens of networking and signal processing. It should be noted that the term signal processing here is not limited to the processing of the traditional analog or digital signals, but rather should be understood as a wide range of computational and/or analytical techniques for transformation and interpretation of information. Therefore this course will focus on various theories and techniques that help make sense of the Big Data, as well as their applications on various engineering domains, such as machine learning, networking, energy systems, and so on. There are three main objectives of writing this course. The first objective is to provide an introduction to the big data paradigm, from the signal processing perspective. The second objective is to introduce the key techniques to enable signal processing for big data in a comprehensive way. The third objective is to present the state-of-the-art big data applications. This will include classifications of the different schemes and the technical details in each scheme.		
开课院系	信息科学技术学院		
通选课领域			
是否属于艺术与美育	否		
平台课性质			
平台课类型			
授课语言	中英双语		
教材	无； 无,		
参考书			
教学大纲	本课程专注于各种大数据理论与技术（机器学习，网络，能源系统），以及他们在工业界的实际应用。本课程第一个目标是介绍大数据技术范式，第二个目标是全面学习和掌握大数据处理的关键技术，第三个目标是了解前沿的大数据应用。 1. Overview 2. Basics Review 3. Big Scale Optimization: block structured 4. Big Scale Optimization: ADMM 5. Big Scale Optimization: sparsity 6. Big Scale Optimization: finite sum 7. Big Scale Optimization: Mixed Integer Programming 8. Big Scale Optimization: applications 9. Deep Learning Basics 10. Deep Learning Regulation and Optimization 11. Deep Learning CNN and RNN details 12. Deep Learning Methodology and Applications 13. Deep Learning Advanced Topics 14. Sublinear Algorithm 15. Bayesian Nonparametric Learning 16. Tensor 17. Software: Tensorflow, MapReduce, Spark, Hadoop. 课堂讲授、文献阅读、讨论、报告。 作业、课程报告、考试		
教学评估	边凯归： 学年度学期：18-19-3，课程班：网络与大数据应用1，课程推荐得分：0.0，教师推荐得分：1.67，课程得分分数段：80及以下；		