TOPIC: Nesterov's Accelerating Technique for Composite Optimization

SPEAKER: Hongkun Xu, Hangzhou Dianzi University

TIME: 3:00pm-4:00pm, Thursday, November 30, 2017

VENUE: Room 264, Geography Building, Zhongbei Campus

HOST: Xingbin Pan, East China Normal University

ABSTRACT OF THE TALK

In many applied areas such as compressed sensing and machine learning, it is commonly needed to solve a composite optimization problem where the objective function is a sum of two (or more) component functions, one of which may have a simple structure and plays the role of regularization. To solve such a composite optimization problem, the proximal algorithm is prevalingly applied. This algorithm has however a slow sublinear rate of convergence. Yu. Nesterov (1983) initiated an acceleration method which can speed up the convergence rate of the gradient-projection algorithm from $O(1/k)$ to $O(1/k^2)$. This is extended to the case of composite optimization by Beck and Teboulle in 2009. Since then Nesterov's acceleration has been paid a lot of attention by researchers from various areas including optimization, engineering, computer science, statistics, and so on.

In this talk, we will briefly introduce the results on the study of Nesterov's acceleration technique and its application in big data problems and connection with the asymptotics of certain dynamic systems.
BIOGRAPHY

Hong Kun Xu is currently Distinguished Professor at Hangzhou Dianzi University in Hangzhou, China. He received B.S., M.S. and Ph.D. degrees from Zhejiang Normal University in 1982, Zhejiang University in 1985 and Xi’an Jiaotong University in 1988, respectively. Subsequently, he joined East China University of Science and Technology as Lecturer and was promoted to Associate Professor in 1990. He took a Visiting Professor position at the University of Seville (Spain) from October 1992 to July 1993, and was a Postdoctoral Fellow at Dalhousie University (Canada) for the 1993/1994 academic year. He joined the University of Durban-Westville (renamed as University of KwaZulu-Natal in 2004) in August 1994 as an Associate Professor and was promoted to Professor in 1997 and Senior Professor in 2003. Xu was a Professor at King Saud University from February 1999 to July 2000. From Jan 2008 to Jan 2015, he was with the National Sun Yat-sen University (NSYSU) as Xiwan Chair Professor. He was Head of the Department of Applied Mathematics from Nov 2010-July 2013 and Dean of College of Science from Feb 2014-Jan 2015 both at NSYSU. Xu held visiting positions at many institutions in several countries and was a Japan JSPS Invitational Fellow with Tokyo Institute of Technology from December 2003 to January 2004. In 2014 he was selected by the Zhejiang “1000 Talents” program. He has addressed many international conferences as invited and keynote speakers. Xu is the winner of several awards, including the 2004 South African Mathematical Society Research Distinction. He was elected fellow to the Academy of Science of South Africa in 2005 and to TWAS, the World Academy of Sciences, in 2012. He has been Thomson Reuters Highly Cited Researcher since 2014. Xu's research areas include nonlinear functional analysis, iterative methods for nonlinear equations, and inverse and ill-posed problems, convex and nonconvex optimization algorithms for big data problems, geometry of Banach spaces, and mathematical finance.