



Illinois Center for Wireless Systems

ICWS Seminar Series



NETWORK CODING FOR CLOUD STORAGE

Professor Alexandros Dimakis
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Monday, December 5, 2011, 4:00 p.m.
141 Coordinated Science Lab

Abstract: Modern distributed storage systems often use erasure coding to introduce redundancy for high reliability. We show how network coding can surprisingly make the maintenance of such distributed erasure coded systems more efficient by orders of magnitude compared to standard Reed-Solomon codes. Following recent developments, we show that interference alignment, a technique developed for wireless communications, is fundamental for distributed storage problems. We will present information theoretic performance bounds and achievable schemes based on novel network codes that use interference alignment. Finally, an implementation of novel regenerating codes in hadoop and a comparison to the Reed-Solomon HDFS system currently used by Facebook will be presented.

Biography: Alex Dimakis is an Assistant Professor at the Viterbi School of Engineering, University of Southern California. He has been a faculty member in the Department of Electrical Engineering since 2009. He received his Ph.D. in 2008 and M.S. degree in 2005 in electrical engineering and computer sciences from UC Berkeley and the Diploma degree in Electrical and Computer Engineering from the National Technical University of Athens in 2003. He received the NSF Career award in 2011, the Eli Jury dissertation award in 2008 and two outstanding paper awards. He served as the chair of the Data Storage track at Globecom and was a keynote speaker at the International Symposium on Network Coding (NetCod). His research interests include communications, coding theory, signal processing, and networking, with a current focus on distributed storage, network coding, distributed inference and message passing algorithms.

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