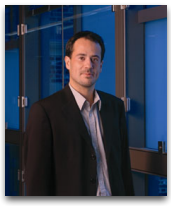
Cornell University $\mathbb{I}$*nformation,* $\mathbb{S}$*ystems, and* $\mathbb{N}$*etworks seminar*

Optimal resource allocation in wireless communication and networking

Rhodes Hall 310: October 12, 2011 @ 12:00PM



ISN Seminar Speaker:
Alejandro Ribeiro
University of Pennsylvania

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Abstract

Many problems in optimal design in wireless communications and networking necessitate the allocation of power across fading states. These problems are challenging because: (i) The number of fading states, and as a consequence the number of power allocations to be determined, is infinite.(ii) Constraints inthe resource allocationvariables are typically not convex. (iii) The channels' probability distributions are unknown.In this talk we will see that for a wide class of problems the duality gap of the resulting optimization problems is null despite the presence of non-convex constraints. Because dual functions are always convex, this property permits solution and analysis in the dual domain. We will further exploit this property to introduce a class ofergodic stochastic optimization (ESO) algorithms to solve resource allocation problems in wireless communications and networking.Salient features of ESO algorithms are that theydo not require access to the state's probability distribution, thatthey can handle non-convex constraints in the resource allocationvariables, and that convergence to optimal operating points holdsalmost surely.

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Biography

Alejandro Ribeiro is an assistant professor at the Department ofElectrical and Systems Engineering at the University of Pennsylvania,Philadelphia, where he started in 2008. He received the B.Sc. inelectrical engineering from the Universidad de la Republica Orientaldel Uruguay, Montevideo, in 1998. From 2003 to 2008 he was at theDepartment of Electrical and Computer Engineering, the University ofMinnesota, Minneapolis, where he received the M.Sc. and Ph.D. inelectrical engineering. From 1998 to 2003 he was a member of thetechnical staff at Bellsouth Montevideo. His research interests lie inthe areas of communication, signal processing, and networking. Hiscurrent research focuses on wireless communications and networking,distributed signal processing, wireless sensor networks, and communications for mobile robots. He is aFulbright scholar and received the NSFCAREER award in 2010.He is also the recipient of student paperawards at ICASSP 2005and ICASSP 2006.