

Dr. Marcelo Weinberger  
Hewlett-Packard Labs  
Palo Alto, CA

Monday, November 19, 2007  
LWSN 1142  
2:00 p.m.



## Title

*Information Theory in an Industrial Research Lab*

## Abstract

While mathematical in nature, information theory addresses at least three basic engineering problems: data compression, coding for error correction, and certain aspects of cryptography. It is therefore not surprising that an industrial research lab would want to maintain core expertise in technologies that were crucial in enabling the multimedia revolution. But if the target is the practical applications - the algorithms, the industry standards - why research the mathematical foundations - the mathematical models, the fundamental bounds? In this talk, I will try to address this question by presenting "a few years" in the life of the Information Theory Research group at HP Labs. How does the group "re-search the mathematical foundations and practical applications of information theory, generating intellectual property and technology for HP through the advancement of scientific knowledge in these areas," as its "mission" states? How does its approach differ from the prevalent one among information theorists in the academia? From theorems in universal coding and universal denoising to industrial standards on image compression and patents on image denoising, from capacity calculations in constrained coding to DVD standards, we will discuss the many faces of information theory.

## Biography

Marcelo J. Weinberger received the Electrical Engineer degree from the Universidad de la República, Montevideo, Uruguay, in 1983, and the M.Sc. and D.Sc. degrees from Technion -- Israel Institute of Technology, Haifa, Israel, in 1987 and 1991, respectively, both in electrical engineering. Since 1993 he has been with Hewlett-Packard Laboratories, Palo Alto, California, where he is a Principal Research Scientist and manages the Information Theory Research group. His research interests include source coding, sequential decision problems, statistical modeling, and image compression. He is a coauthor of the algorithm at the core of the JPEG-LS lossless image compression standard, and was an editor of the standard specification. He also contributed to the coding algorithm of the JPEG2000 image compression standard.

Dr. Weinberger was a co-recipient of the 2006 ComSoc & Information Theory Joint Paper Award. He is an IEEE Fellow and served as an Associate Editor for Source Coding of the IEEE TRANSACTIONS ON INFORMATION THEORY from 1999 to 2002.

**PURDUE**  
UNIVERSITY

A reception will be held before the talk in LWSN 1142.

If you are interested in meeting with Dr. Weinberger should contact Prof. Szpankowski at [spa@cs.purdue.edu](mailto:spa@cs.purdue.edu) or 46703.

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