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# Daniel Marco

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## CURRENT

### **Postdoctoral Scholar, 2004 – 2006**

Center for the Mathematics of Information, California Institute of Technology, Pasadena CA

## EDUCATION

### **Ph.D. in Electrical Engineering, 2004**

University of Michigan, Ann Arbor, MI

Dissertation: Asymptotic Scalar Quantization and Applications to Sensor Networks

Dissertation Advisor: Professor David L. Neuhoff

### **Master of Science in Mathematics, 2003**

University of Michigan, Ann Arbor, MI

### **Master of Science in Electrical Engineering, 2001**

University of Michigan, Ann Arbor, MI

Major: Communications Minor: Signal Processing

### **Bachelors of Science in Electrical Engineering and Computer Science, 1999**

Technion – Israel Institute of Technology, Haifa, Israel

### **Mathematics and Computer Science – 1 year studies, 1995 – 1996**

Open University, Tel Aviv, Israel

## RESEARCH INTERESTS

Information Theory:

- Coding with side information
- Stochastic Processes
- Sensor networks

Data Compression:

- Asymptotic quantization theory

## INVITED LECTURES

- “Low Resolution Scalar Quantization and Entropy of Highly Correlated Quantized Samples”, Tel Aviv University, Tel Aviv, Israel, Dec. 2004.
- “Data Compression in Sensor Networks”, Haifa, Israel, Apr. 2005.
- “Distributed lossy and lossless source coding”, JPL/NASA, Pasadena, CA, Oct. 2006.

## TEACHING EXPERIENCE

**Graduate Student Instructor**, University of Michigan, Ann Arbor, Michigan

- EECS 501 - Probability and Random Processes, Sep. 2002 – Dec. 2002.
- EECS 401 - Probability Methods in Engineering, Jan. 2001 – Apr. 2001.
- EECS 280 - Programming and Introductory Data Structures, Sep. 2000 – Dec. 2000.

## HONORS AND AWARDS

University of Michigan EECS Departmental Fellowship, Sep. 1999 – Aug. 2000.

Award for Academic Excellence, Technion - Israel Institute of Technology, 1999.

Award for Academic Excellence, Technion - Israel Institute of Technology, 1997.

## GENERAL

Member of the Information Theory Society of the IEEE

Competition Chair of the University of Michigan Ballroom Dance Team, 2003

Military Service – Israel Defence Forces 1993 – 1996

Fluent in Hebrew, English, and Romanian

## PUBLICATIONS

### JOURNAL

- **Daniel Marco** and David L. Neuhoff, "The Validity of the Additive Noise Model for Uniform Scalar Quantizers", *IEEE Transactions on Information Theory*, vol. 51, pp. 1739–1755, May 2005.
- **Daniel Marco** and David L. Neuhoff, "Low Resolution Scalar Quantization for Gaussian Sources and Squared Error", *IEEE Transactions on Information Theory*, vol. 52, pp. 1689–1697, Apr. 2006.
- **Daniel Marco** and David L. Neuhoff, "Low Resolution Scalar Quantization for Gaussian Sources and Absolute Error", *IEEE Transactions on Information Theory*, vol. 53, pp. 1177–11179, Mar. 2007.
- **Daniel Marco** and David L. Neuhoff, "Entropy of Highly Correlated Quantized Data", submitted to *IEEE Transactions on Information Theory*.
- **Daniel Marco** and Michelle Effros "On Lossless Coding with Side Information", submitted to *IEEE Transactions on Information Theory*.
- **Daniel Marco** "Markov Random Processes are Neither Bandlimited nor Information-Singular and are Mostly Non-Recoverable", submitted to *IEEE Transactions on Information Theory*.

## REFEREED CONFERENCES

- David L. Neuhoff and **Daniel Marco**, "Distributed Encoding of Sensor Data", *IEEE Information Theory Workshop, ITW 2002, Bangalore, India*, Oct. 20-25, 2002.
- **Daniel Marco**, Enrique J. Duarte-Melo, Mingyan Liu and David L. Neuhoff, "On the Many-to-One Transport Capacity of a Dense Wireless Sensor Network and the Compressibility of Its Data", *Workshop on Information Processing in Sensor Networks (IPSN), Palo Alto, CA.*, pp. 1-16, Apr. 22-23, 2003.
- **Daniel Marco** and David L. Neuhoff, "Uniform Scalar Quantizers – Distortion and the Additive Noise Model", *IEEE International Symposium on Information Theory, ISIT 2003, Pacifico Yokohama, Yokohama, Japan*, p. 462, June 29 - July 4, 2003.
- **Daniel Marco** and David L. Neuhoff, "Reliability vs. Efficiency in Distributed Source Coding for Field-Gathering Sensor Networks", *Workshop on Information Processing in Sensor Networks (IPSN), Berkeley, CA.* Apr. 26-27, 2004.
- **Daniel Marco** and David L. Neuhoff, "Performance of Low Rate Entropy-Constrained Scalar Quantizers", *IEEE International Symposium on Information Theory, ISIT 2004, Chicago, IL.* June 27 - July 2, 2004.
- **Daniel Marco** and David L. Neuhoff, "Entropy of Quantized Data at High Sampling Rates", *IEEE International Symposium on Information Theory, ISIT 2005, Adelaide, Australia.* Sep. 4-9, 2005.
- **Daniel Marco** and David L. Neuhoff, "Low Rate Scalar Quantization for Gaussian Sources and Absolute Error", *IEEE International Symposium on Information Theory, ISIT 2006, Seattle, WA.* July 9-14, 2006.
- **Daniel Marco** "Markov Random Processes are not Recoverable After Quantization and Mostly not Recoverable From Samples", *IEEE International Symposium on Information Theory, ISIT 2007, Nice, France.* June 24-29, 2007.

## INVITED CONFERENCES

- **Daniel Marco** and Michelle Effros, "A Partial Solution for Lossless Source Coding with Coded Side Information", *IEEE Information Theory Workshop, ITW 2006, Punta del Este, Uruguay.* Mar. 13-17, 2006.

## TECHNICAL REPORTS

- **Daniel Marco** and David L. Neuhoff, "Marker Codes for Channels with Insertion, Deletion and Substitution Errors", *Technical Report, EECS Department, University of Michigan, CSPL, TR-347, Dec., 2003.*
- **Daniel Marco** and David L. Neuhoff, "Low Resolution Scalar Quantization for Gaussian and Laplacian Sources with Absolute and Squared Error Distortion Measures", *Technical Report, EECS Department, University of Michigan, CSPL, TR-372, Jan., 2006.*