Curriculum Vitae

Personal Information

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Citizenship	Romanian

Research Interests

Image Processing and Coding, Multiresolution and Multiscale Representations, Independent Component Analysis, Matrix Analysis, Algebraic Signal Processing Theory, Frame Theory, Algorithms

Current Position

Postdoctoral Fellow within the School of Interactive Computing, at Georgia Institute of Technology. Supervisors: Aaron Bobick and Frank Dellaert.

Education

2002 – 2009: **Ph.D.** - Computer Science, Carnegie Mellon University
Thesis advisor: Michael Lewicki.
Dissertation Title: *Efficient and Robust Signal Approximations* (June 2009).
Thesis committee: Michael Lewicki, Jelena Kovačević, Manuel Blum, Markus Püschel, Gary Miller.

2000 – 2002: **M.S.** - Computer Science, University of Bucharest, Romania

1996 – 2000: **B.S.** - Computer Science and Mathematics, University of Bucharest, Romania.

Awards and Fellowships

2002 – 2009: Graduate Assistant Fellowship, Carnegie Mellon University, Computer Science Department.

2004: NSF support grant for attending the Workshop on "Multiscale Geometry in Image Processing and Coding", at the Institute for Pure and Applied Mathematics, UCLA, Los Angeles, CA September 20-24, 2004.

2001: Grant offered by the sponsors of the Advanced Study Institute and by Institut für Informatik, München, Germany, for attending the "International Student Summer School on Proof and System-Reliability", Marktoberdorf, Germany, July 24 - August 5, 2001

1999 – 2000: 4 month scholarship at the University of Patras, Greece, offered by the European Community, within the Erasmus/Socrates Student Interchange Program

2000 – 2001: Meritorious Fellowship offered by the Romanian Department of Education (during my MS studies)

1996 – 2000: Meritorious Fellowship offered by the Romanian Department of Education (during my undergraduate studies)

Publications

Journal and Conference Papers

[1] D.C. Balcan and M.S. Lewicki. Point Coding: Sparse Image Representation with Adaptive Shiftable-Kernel Dictionaries. In *SPARS Workshop*, Saint Malo, France, 2009.

[2] D.C. Balcan and M.S. Lewicki. Adaptive coding of images via Multiresolution ICA. In *IEEE ICASSP*, 2009.

[3] D. Balcan, A. Sandryhaila, J. Gross, and M. Püschel. Alternatives to the Discrete Fourier Transform. In *IEEE ICASSP*, 2008.

[4] E. Doi, D.C. Balcan, and M.S. Lewicki. Robust Coding over Noisy Overcomplete Channels. *IEEE Trans. Im. Proc.*, 16(2):442–452, February 2007.

[5] J. Rosca, T. Gerkmann, and D.C. Balcan. Statistical Inference of Missing Speech Data in the ICA Domain. In *Proc. IEEE ICASSP*, Toulouse, France, 2006.

[6] D.C. Balcan and J. Rosca. Independent Component Analysis for Speech Enhancement with Missing TF Content. In *Proc. Intl. Conf. on ICA*, Charleston, SC, USA, 2006.

[7] E. Doi, D.C. Balcan, and M.S. Lewicki. A Theoretical Analysis of Robust Coding over Noisy Overcomplete Channels. In *Advances in Neural Information Processing Systems 18*. MIT Press, 2006.

[8] E. Kavallieratou, D.C. Balcan, M.F. Popa, and N. Fakotakis. Handwritten Text Localization in Skewed Documents. In *IEEE ICIP*, volume 1, pages 1102–1105, Thessaloniki, Greece, 2001.

[9] M.F. Popa and D.C. Balcan. An Adaptive Resonance Theory (ART) Based Approach of Handwritten / Machine-Printed Text Discrimination. In *SCI/ISAS*, Orlando, FL, USA, 2001.

[10] M.F. Popa and D.C. Balcan. An Adaptive Resonance Theory (ART) Based Approach of Handwritten / Machine-Printed Text Discrimination - an extended report. In *Intl. Conf. Comp. and Ind. Eng.*, Montreal, Canada, 2001.

[11] M.F. Popa and D.C. Balcan. Approaches to handwritten/machine printed discrimination problem. *University of Bucharest Annals - Computer Science*, 2000.

[12] M.F. Popa and D.C. Balcan. New Methods in Handwritten / Machine-Printed Discrimination. In *8th Conf. on Appl. and Industrial Math.*, Pitesti, Romania, 2000.

Working manuscripts

[13] D.C. Balcan and M.S. Lewicki. Characterization and Computation of Robust Coding Solutions.

Other Publications

[14] M.F. Balcan, D.C. Balcan, and Cr. Paun. Chapter 1 - Data Defining Language. In I. Popescu, editor, *Procedural and Non-procedural Query Resolution in ORACLE8*. Ed. Tehnica, Bucharest, 2002. (in Romanian).

[15] M. Balcan, D.F. Anghel, A. Voicu, and D.C. Balcan. Determination of thermodynamic parameters of ethoxylated nonionic surfactants by means of reversed-phase high-performance liquid chromatography. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 204(1-3):141–151, 2002.

Work Experience

June – August 2005: Research Intern, Siemens Corporate Research, Princeton, NJ. Research in Signal Processing.

2001 – 2006: Instructor, Computer Science Department, Faculty of Mathematics and Computer Science, University of Bucharest, Romania.

October 1999 – January 2000: Research Assistant, Speech and Language Processing Group at the Wire Communications Laboratory, University of Patras, Greece. Research in Optical Character Recognition.

Teaching Experience

Guest Lect., Spring 2009: Carnegie Mellon Univ., 42-731/18-795 "Bioimage Informatics" (Instr. Jelena Kovačević).

TA, Fall 2004: Carnegie Mellon University, 15451 "Algorithms" (Instrs. Avrim Blum and Manuel Blum). Responsibilities included weekly sections, grading, and office hours.

TA, Spring 2004: Carnegie Mellon University, 15750 "Graduate Algorithms" (Instr. Manuel Blum). Responsibilities included preparing homeworks, grading and office hours.

TA, Spring 2002: University of Bucharest, "Introduction to Computer Science". Responsibilities included weekly labs, preparing homeworks, and grading.

TA, Fall 2001: University of Bucharest, "Introduction to Computer Science". Responsibilities included weekly labs, preparing homeworks, and grading.

TA, Fall 2001: University of Bucharest, "Algorithms and Programming Techniques". Responsibilities included weekly sections, preparing homeworks, and grading.

TA, Spring 2001: University of Bucharest, "Introduction to Computer Science". Responsibilities included weekly labs, preparing homeworks, and grading.

TA, Fall 2000: University of Bucharest, "Introduction to Computer Science". Responsibilities included weekly labs, preparing homeworks, and grading.

Professional Service

Journal refereeing: IEEE Transactions on Information Theory, Journal of Vision, Applied and Computational Harmonic Analysis.

Conference refereeing: IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), IEEE International Symposium on Biomedical Imaging (ISBI).

Other activities: Student Volunteer at Neural Information Processing Systems and Workshop (NIPS), Vancouver-Whistler, BC, Canada.

Professional affiliations

- IEEE, SIAM, AMS.

Skills

- Programming Languages: C/C++, Matlab, Pascal, Prolog
- Spoken Languages: English, French, Romanian (native), Russian (beginner)

References

- **Michael S. Lewicki** (Ph.D. advisor)
  Associate Professor
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- **Jelena Kovačević**
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- **Justinian Rosca**
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