

# Curriculum Vitae

## Personal Information

Name	Doru-Cristian BALCAN
Current Position	Ph.D. Student
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Citizenship	Romanian
Visa Status	F-1

## Education

- 2002 – present: **Ph.D. Student** - Computer Science, Carnegie Mellon University  
Dissertation Title: *Efficient and Robust Signal Approximations* (Spring 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.

## Research Interests

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

## Awards and Fellowships

- 2002 – present: 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", Marktobendorf, 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

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)  
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- **Manuel Blum**  
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- **Justinian Rosca**  
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