

Bogdan Roman

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INTERESTS Sampling theory, Signal processing, Undersampled reconstruction, Physical and medical imaging, spectroscopy, microscopy methods, Wireless communications, Software defined radio.

EDUCATION 2006-2010: University of Cambridge, UK, Computer Laboratory. PhD, Thesis "Scalable Cross-Layer Wireless Medium Access"

2001-2002: University of Versailles, France. MSc, Mobile Networks and Radio Communications.

1997-2001: Politehnica University of Bucharest, Romania. BSc, Electrical Engineering.

POSITIONS 2016-date: Senior Research Associate, Centre for Mathematical Imaging in Healthcare, Department of Pure Mathematics and Mathematical Statistics, University of Cambridge.

2010-date: Research Fellow, Computer Laboratory department, University of Cambridge.

2015-date: Coordinator and principal architect of the *Computer Science Admissions Test (CSAT)*, University of Cambridge, <http://www.cl.cam.ac.uk/csats/>

2016-date: Director of Studies and By-Fellow, Queens' College, University of Cambridge.

2013-2016: Research Associate, Department of Applied Mathematics and Theoretical Physics, University of Cambridge.

2010-2016: Director of Studies, Homerton College, University of Cambridge.

2010-2013: Postdoctoral Research Fellow, Homerton College, University of Cambridge.

2002-2005: Hardware engineer and lead developer, Artabel SA, France.

2002: Intern (6 months) Statistical analysis of the Vodafone HLR network, Vodafone, France.

2000-2001: FPGA developer of the PHY and MAC of the WiFi standard (IEEE 802.11), Redline Communications Inc., Romania.

PRIZES 2016: Cambridge University nomination for the Rosetrees Prize for Interdisciplinary Research, <http://www.damtp.cam.ac.uk/comms/144.html>

2011: Postdoctoral Research Fellowship, Homerton College, University of Cambridge

2010: Microsoft Research - Software Radio Award

2008 & 2007: Girton College Cambridge Research Scholarship

2007: Cambridge European Trust Scholarship

2006: Felix Telecom Romania Sponsorship

2006: Ratiu Foundation UK Scholarship

2002: Vodafone France, Internship Prize

2001: Erasmus European Scholarship

PUBLICATIONS B. Roman, R. Calderbank, B. Adcock, M.Graves, D. Niellispach, I. Calvo-Almazan, M. Bostock, A. Hansen, "Undersampling improves fidelity of physical imaging and the benefits grow with resolution," Proc. Natl. Acad. Sci., PNAS, 2017 (in revision)

B. Roman, A. Bastounis, B. Adcock, A. Hansen, "On fundamentals of models and sampling in compressed sensing," Appl. Comput. Harmon. Anal., ACHA, 2016 (in submission)

B. Roman, B. Adcock, A. Hansen, "On asymptotic structure in compressed sensing," arXiv:1406.4178 [math.FA], 2016 (in submission)

[alphabetic] B. Adcock, A. Hansen, C. Poon, B. Roman, "Breaking the coherence barrier: A new theory for compressed sensing," *Forum of Math. Sigma*, 2017

[alphabetic] B. Adcock, A. Hansen, B. Roman, "A note on compressed sensing of structured sparse wavelet coefficients from subsampled Fourier measurements," *IEEE Lett Sig Proc*, 23(5), 2016

[alphabetic] B. Adcock, A. Hansen, B. Roman, "Compressed sensing with local structure: Theory, applications and benefits," *IEEE Sampling Theory and Applications*, SampTA, 2015

[*alphabetic*] B. Adcock, A. C. Hansen, B. Roman, "The quest for optimal sampling: Computationally efficient, structure-exploiting measurements for compressed sensing," Book: Compressed Sensing and Its Applications, Springer, 2015

[*alphabetic*] B. Adcock, A. Hansen, B. Roman, G. Teschke, "Generalized sampling: stable reconstructions, inverse problems and compressed sensing over the continuum," Book: Advances in Imaging and Electron Physics, vol. 182, Elsevier, 2014

[*alphabetic*] B. Adcock, A. Hansen, C. Poon, B. Roman, "Overcoming the coherence barrier in compressed sensing," IEEE Sampling Theory and Applications, SampTA, 2013

S. Akoush, R. Sohan, B. Roman, A. Rice, A. Hopper, "Activity Based Sector Synchronisation: Efficient Transfer of Disk-State for WAN Live Migration," IEEE/ACM Modelling, Analysis and Simulation of Computer and Telecommunication Systems, 2011

B. Roman, I. Wassell, I. Chatzigeorgiou, "Scalable Cross-Layer Access Control Using Multi-Carrier Burst Contention," IEEE Journal of Selected Areas in Communications, 29(1), 2011

B. Roman, I. Chatzigeorgiou, I. Wassell, "Evaluation of Multi-Carrier Burst Contention and IEEE 802.11 with Fading During Channel Sensing," in IEEE Personal Indoor and Mobile Radio Communications Conference, 2009.

B. Roman, F. Stajano, I. Wassell, D. Cottingham, "Multi-Carrier Burst Contention: Scalable Medium Access Control for Wireless Networks," IEEE Wireless Communications and Networking Conference, 2008

B. Roman, F. Stajano, "Scalable Medium Access Control," Microsoft Research Workshop 2007, Cambridge, UK, 2007 (won 2nd place)

Papers are available at <http://www.damtp.cam.ac.uk/user/abr28>

CONFERENCE & TEACHING

Recent: Matheon 2017 (*invited speaker*), iTWIST 2016 (*plenary speaker*), IFIP 2015 (*invited speaker*), SIAM-CSE 2015 (*invited speaker*), Spatial Data Analysis 2015 (*invited speaker*), Curves and Surfaces 2014 (*speaker*)

Multiple invited seminars and talks at various universities and departments and past conferences.

2013-date: Co-Lecturing the Part III (Master's) course "Sampling theory and compressed sensing", Department of Applied Mathematics and Theoretical Physics, University of Cambridge

2011-2014: Invited lecturer, Part II (3rd year undergraduate) lecture "From Wired to Wireless Networks", Computer Laboratory, University of Cambridge

2007-date: Undergraduate supervisions (one-to-one teaching) at the departments of Engineering and the Computer Laboratory, University of Cambridge. Supervised 300+ students on various courses, from pure maths to signal processing and electrical engineering.

2011-2013: Co-supervisor of three Master's students on thesis involving signal processing for wireless communications, Computer Laboratory, University of Cambridge.

1998-2002: Private tutoring of highschool students for maths and physics Olympiads.

ADMISSIONS & COMMITTEES

2015-date: Developed and coordinated the *Computer Science Admissions Test (CSAT)*, <http://www.cl.cam.ac.uk/csats/>

2010-date: Undergraduate admissions interviews (300+ by 2015) for Computer Science and Physics at Queens', Homerton, Fitzwilliam, Downing colleges, University of Cambridge.

2014-date: Joint Teaching Strategy committee, Computer Laboratory, University of Cambridge.

2014-date: Equality and Diversity committee, Computer Laboratory, University of Cambridge. The Computer Laboratory received the Athena Swan Bronze Award in 2015.

2013-date: Outreach committee, Computer Laboratory, University of Cambridge. Frequent speaker at the yearly Oxford and Cambridge Student Conferences around UK. Co-organizer of Open Days and Coding summer school at the University of Cambridge.