

Luca Sanguinetti

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POSITION HELD Assistant Professor Dec. 2010 - onwards
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University of Pisa
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PERSONAL Born Feb. 1977, citizen of Italy, fluent in English.

RESEARCH INTERESTS My expertise and general interests span the areas of signal processing, estimation and detection theory for wireless communications. Current research topics focus on channel estimation, equalization, and synchronization in OFDM-based spectrum-sharing systems with unknown interference, optimization of MIMO relay networks and development of game-theoretic solutions for energy-efficient contention-based synchronization in OFDMA systems.

EDUCATION **Ph.D. in Information Engineering**
University of Pisa, Italy Jan. 2003 - May 2006
Dissertation Topic: “Pre-Filtering in MC-CDMA Downlink Transmissions”
Advisors: Umberto Mengali and Michele Morelli

Laurea degree (eqv. M.Sc., 5 years) in Telecommunications Engineering
University of Pisa, Italy Oct. 1996 - June 2002
Thesis’s title: “Channel Estimation and Data Detection in OFDM systems”
Advisors: Umberto Mengali and Michele Morelli

ACADEMIC EXPERIENCE **Sabbatical Researcher**
Alcatel-Lucent Chair June 2013 - May 2015
Ecole supérieure d’électricité (SUPELEC)

Assistant Professor
Department of Information Engineering Dec. 2010 -present
University of Pisa

Research assistantship
DAAD STIBET funding June 2010 - Sept. 2010
Technische Universität München
Distributed consensus in UWB sensor networks
In collaboration with Prof. Luca Scardovi

Postdoctoral research associate
Department of Information Engineering July 2008 - Nov. 2010
University of Pisa
Synchronization and detection in OFDM-based spectrum sharing systems with unknown interference

In collaboration with Prof. M. Morelli.

Postdoctoral research associate

Department of Electrical Engineering
Princeton University

June 2007 - 2008

Ranging schemes for OFDMA-based systems
In collaboration with Prof. H. Vincent Poor.

Postdoctoral research associate

Department of Information Engineering
University of Pisa

Jan. 2006 - May 2007

Non-linear pre-coding techniques and channel estimation schemes for multi-carrier transmissions
In collaboration with Prof. U. Mengali.

Visiting Ph.D. Student

German Aerospace Center (DLR)
Oberpfaffenhofen, Germany

Jan. 2004 - June 2004

Pre-filtering techniques for MC-CDMA downlink transmissions
In collaboration with S. Kaiser and I. Cosovic.

**TEACHING
EXPERIENCE**

Co-Instructor

Digital Communications – Graduate course
University of Pisa, Italy
In collaboration with Prof. Marco Luise

Spring, 2013

Co-Instructor

Telecommunications – Graduate course
University of Pisa, Italy
In collaboration with Prof. Michele Morelli

Fall, 2012

Co-Instructor

Digital Communications – Graduate course
University of Pisa, Italy
In collaboration with Prof. Marco Luise

Spring, 2012

Co-Instructor

Digital Communications – Graduate course
University of Pisa, Italy
In collaboration with Prof. Marco Luise

Spring, 2011

Co-Instructor

Basics of non-cooperative Game Theory and its applications to wireless communications - Graduate course
University of Pisa, Italy
In collaboration with Dr. Giacomo Bacci

Spring, 2011

Co-Instructor

Basics of non-cooperative Game Theory - Undergraduate course
University of Pisa, Italy
In collaboration with Dr. Giacomo Bacci

Spring, 2010

Instructor

Multiple antennas in wireless communications - Graduate course

Spring, 2009

University of Pisa, Italy

Teaching Assistant

Spring 2005 - 2006

Digital Transmissions – Undergraduate course

University of Pisa, Italy

Professor: Michele Morelli

Teaching Assistant

Spring 2003 - 2004

Digital Transmissions – Graduate course

University of Pisa, Italy

Professor: Umberto Mengali

Research projects **”Network of Excellence in Wireless COMmunications # - NEWCOM#”**
Fund. org.: FP7 - NoE Contract no. 318306 Nov. 2012 - Oct. 2014

Task leader for the development of game-theoretical energy-efficient interference management techniques for heterogenous networks.

”Low-interceptable Communication Link Antennas”

Fund. org.: Ingegneria dei Sistemi (IDS) <http://www.idscompany.it> Jan. 2012 - Dec. 2012

Task leader for the development of physical-layer security techniques for wireless communications employing multiple transmit antennas.

”Short Wave critical Infrastructure Network based on new Generation of high survival radio communication systems” <http://swing.rm.ingv.it/>

Fund. org.: Istituto nazionale geofisica e vulcanologia (INGV) Jan. 2012 - Dec. 2013

Task leader for the study of a high survival high-frequency radio network to real-time support of communications among european critical infrastructures.

”Seamless aeronautical networking through integration of data links, radios, and antennas” (SANDRA) <http://www.sandra.aero/index.php>

Fund. org.: FP7 - Contract no. 233679 Jan. 2009 - Dec. 2013

Task leader for the development of synchronization and channel estimation schemes for the downlink and uplink of AeroMax communications systems.

”NEWCOM++ - NETwork of Excellence in Wireless COMmunications++”

Fund. org.: European commission FP7 - NoE Contract no. 216715 Jan. 2008 - Dec. 2010

”Design of efficient algorithms for cognitive radio systems”

Fund. org.: University of Pisa Dec. 2009 - Dec. 2010

Task leader for the design of synchronization and data detection techniques in spectrum-sharing systems based on OFDM(A) technologies.

”Advanced signal processing techniques for inter-cell interference mitigation in HSDPA-MIMO systems and IEEE 802.11n WLAN standards”

Fund. org.: TELECOM Italia Mobile Oct. 2006 - May 2007

Task leader for the development and study of equalization techniques in asynchronous multiuser MIMO-OFDM networks.

Task leader for the development and study of space-time receivers for HSPDA systems with spatial division multiplexing.

”Towards Multi-Carrier Based Cognitive Radio: Resolving PHY Layer Issues ”

Fund. org.: DoCoMo Eurolabs

Aug. 2006 - April 2007

Task leader for the development and study of spectrum shaping techniques for OFDM-based cognitive radio networks and timing synchronization techniques in multi-carrier ad-hoc networks.

”Advanced signal processing techniques for improving the coverage of IEEE 802.11n WLAN standards.”

Fund. org.: TELECOM Italia Mobile

Sept. 2005 - Sept. 2006

Task leader for the study of transmit and receive diversity techniques for MIMO-OFDM transmissions.

Piattaforme Riconfigurabili per Interoperabilità in Mobilità (PRIMO): <http://primo.ismb.it/firb>

Fund. org.: MIUR

Nov. 2002 - Oct. 2005

As a post-graduated student first and a Ph.D student later, I was involved in the development of channel equalization and data detection techniques for MC-CDMA and OFDMA systems.

EDITORIAL WORK

Associate Editor for the *IEEE Transactions on Wireless Communications*.

Reviewer for the following journals: IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Signal Processing, IEEE Transactions on Vehicular Technology, IEEE Communications Letters and IEEE Wireless Communications Letters.

PROJECT REVIEWER SERVICE

Qatar National Research Fund (QNRF), Qatar.

Exhibit co-Chair ICASSP2014.

TPC member for ICC 2011, Eusipco 2011, European Wireless 2010 and CIP 2010.

Co-organizer of the ”Newcom++ Spring School 2010 on Cognitive Wireless Communication Networks”, April 2010.

Co-organizer of the special session ”Advances in Game-Theoretic Tools for Wireless Communications” at EUSIPCO2010.

Co-organizer of the special session ”OFDMA Technologies” at EW2010.

AWARDS

Best paper award at WCNC 2013.

Recipient of the FP7 Marie Curie International European Fellowships for career de-

velopment (IEF) 2013 Dense4Green "Dense deployments for green cellular networks" inspired to the concept of small-cell networks

BOOKS AND CHAPTERS

F. Giannetti, Lombardini, M. Moretti, **L. Sanguinetti** "Esercizi di sistemi di telecomunicazione", ETS, Pisa 2005.

L. Sanguinetti and H. Vincent Poor, 'Fundamentals of Multi-user MIMO Communications', Chapter 6 in *New Directions in Wireless Communications Research*, Springer 2009.

PATENT

M. Morelli, H. Vincent Poor and **L. Sanguinetti**. Invention Disclosure: "A Scheme for Initial Ranging OFDMA-based networks", US 2009/0274222 A1.

G. Bacci, **L. Sanguinetti**, M. Luise, H. Vincent Poor. Invention Disclosure: "A Scheme for Contention-Based Synchronization in FDMA Systems", US pending patent application (filed 10/7/2012).

WORKS UNDER REVIEW

[R5] M. Moretti, **L. Sanguinetti**, "Resource Allocation for Power Minimization in Multi-user MIMO-OFDMA Systems with QoS constraints", submitted to *IEEE Trans. Signal Process.*, May 2013.

[R4] M. Monti, **L. Sanguinetti**, C. Tschudin, M. Luise, "A Chemistry-Inspired Algorithm for Achieving Consensus in Wireless Sensor Networks", submitted to *IEEE Sensors Journal*, March 2013.

[R3] P. Pulini, S. Plass, L. Taponecco, M. Morelli, **L. Sanguinetti**, "AeroMACS Evolution - Synchronization and Performance Analysis during Landing, Take-Off, and Approach Phases", submitted to *IEEE Trans. Aero. Electr. Sys.*, Jan. 2013.

[R2] G. Bacci, **L. Sanguinetti**, M. Luise, H. Vincent Poor, "Energy-efficient Power Control for Contention-based Synchronization in OFDMA Systems with Discrete Powers and Limited Feedback", submitted to *EURASIP J. Wireless Commun. Networking*, Nov. 2012.

[R1] L. Taponecco, **L. Sanguinetti**, "A Physical-layer scheme for achieving consensus in UWB sensor networks", submitted to *IEEE Sensors Journal*, Feb. 2013.

PUBLICATIONS

[J25] **L. Sanguinetti**, A. A. D'Amico and Y. Rong, "On the Design of Amplify-and-Forward MIMO-OFDM Relay Systems with QoS requirements specified as Schur-convex functions of the MSEs", to appear on *IEEE Trans. Vehicul. Technology*.

[J24] G. Bacci, **L. Sanguinetti**, M. Luise and H. Vincent Poor "A game theoretic approach for energy efficient contention-based synchronization in OFDMA systems", *IEEE Trans. Signal Process.*, vol. 61, no. 5, March 2013.

[J23] **L. Sanguinetti**, M. Morelli and L. Marchetti, "A Random Access Algorithm for LTE systems", to appear on *European Trans. Telecommun. (Special issue on Multi-Carrier Transmission and Applications, LTE and LTE-Advanced)*, May 2012.

[J22] **L. Sanguinetti**, A. A. D'Amico and Y. Rong, "A Tutorial on the Optimization of Amplify-and-Forward MIMO Relay Networks", *IEEE J. Select. Areas Commun.*, vol. 30, no. 8, Sept. 2012.

- [J21] **L. Sanguinetti** and M. Morelli, “An Initial Ranging Scheme for IEEE 802.16-based OFDMA Systems”, to appear on *IEEE Trans. Wireless Commun.*, July 2012.
- [J20] **L. Sanguinetti** and A. A. D’Amico, “Power Allocation in Two-Hop Amplify-and-Forward MIMO Relay Systems with QoS requirements”, *IEEE Trans. Signal Process.*, vol. 60, no. 5, May 2012.
- [J19] **L. Sanguinetti**, M. Morelli and H. Vincent Poor, “Robust BICM Decoding of Jammed OFDM Transmissions Using the EM Algorithm”, *IEEE Trans. Wireless Commun.*, vol. 10, no. 9, Sept. 2011.
- [J18] **L. Sanguinetti** and M. Morelli, “A Low-Complexity Frequency Synchronization Scheme for OFDMA Systems”, *IEEE Trans. Wireless Commun.*, vol. 9, no. 8, Aug. 2010.
- [J17] **L. Sanguinetti**, M. Morelli and H. Vincent Poor, “Uplink synchronization in OFDMA spectrum-sharing systems”, *IEEE Trans. Signal Process.*, vol. 58, no. 5, May. 2010.
- [J16] **L. Sanguinetti**, M. Morelli and H. Vincent Poor, “Frame Detection and Timing Acquisition for OFDM Transmissions with Unknown Interference”, *IEEE Trans. Wireless Commun.*, vol. 9, no. 2, Feb. 2010.
- [J15] **L. Sanguinetti**, M. Morelli, and H. Vincent Poor, “An ESPRIT-based approach for Initial Ranging in OFDMA systems”, *IEEE Trans. Commun.*, vol. 57, no. 11, Nov. 2009.
- [J14] **L. Sanguinetti**, L. Taponecco and M. Morelli, “Interference-Free Code Design for MC-CDMA Uplink Transmissions”, *IEEE Trans. Wireless Commun.*, vol. 8, no. 10, Oct. 2009.
- [J13] **L. Sanguinetti**, M. Morelli and G. Imbarlina, “An EM-based Frequency Offset Estimator for OFDM systems with Unknown Interference”, *IEEE Trans. Wireless Commun.*, vol. 8, no. 8, Aug. 2009.
- [J12] M. Morelli, **L. Sanguinetti**, and H. Vincent Poor, “A robust ranging scheme for OFDMA-based networks”, *IEEE Trans. Commun.*, vol. 57, no. 9, Aug. 2009.
- [J11] Antonio A. D’Amico, M. Morelli, and **L. Sanguinetti**, “DOA estimation in the uplink of multicarrier CDMA systems”, *EURASIP J. Wireless Commun. and Networking*, vol. 8, no. 3, Jan. 2008.
- [J10] M. Morelli and **L. Sanguinetti** “A Unified Framework for Tomlinson-Harashima Pre-Coding in MC-CDMA and OFDMA Downlink Transmissions”, *IEEE Trans. Commun.*, vol. 55, no. 9, Sept. 2007.
- [J9] **L. Sanguinetti** and M. Morelli, “Non-Linear Pre-coding for Multiple-Antenna Multi-User Downlink Transmissions with Different QoS Requirements”, *IEEE Trans. Wireless Commun.*, vol. 6, no.3, March 2007.
- [J8] M. Morelli, **L. Sanguinetti** and U. Mengali “A Low Complexity Receiver with Interference Cancellation for Power-Controlled MC-CDMA Downlink Transmissions”, *European Trans. on Commun.*, vol. 17, n.6, May 2006.

[J7] **L. Sanguinetti**, I. Cosovic and M. Morelli “Channel Estimation for MC-CDMA Uplink Transmissions with Combined Equalization”, *IEEE J. Select. Areas of Commun. (Special issue on Advances on Multi-Carrier CDMA systems)*, vol. 24, no. 3, June 2006.

[J6] **L. Sanguinetti** and M. Morelli “Channel Acquisition and Tracking for MC-CDMA Uplink Transmissions”, *IEEE Trans. Veh. Technol.*, vol. 55, no. 3, May 2006.

[J5] M. Morelli, **L. Sanguinetti** and U. Mengali, “Channel Estimation for Adaptive Frequency-Domain Equalization” *IEEE Trans. Wireless Commun.*, vol.4, no. 5, Sept. 2005.

[J4] M. Morelli and **L. Sanguinetti**, “A novel pre-filtering technique for downlink transmissions in TDD MC-CDMA systems” *IEEE Trans. Wireless Commun.*, vol.4, no. 5, Sept. 2005.

[J3] M. Morelli and **L. Sanguinetti**, “Estimation of channel statistics for iterative detection of OFDM signals”, *IEEE Trans. Wireless Commun.*, vol. 4, no. 4, July 2005.

[J2] P. Bisaglia, **L. Sanguinetti**, M. Morelli, N. Benvenuto and S. Pupolin “Pre-equalization techniques for downlink and uplink TDD MC-CDMA systems” *Wireless Personal Commun.*, vol. 35, no. 1 – 2.

[J1] **L. Sanguinetti**, M. Morelli and U. Mengali “Channel estimation and tracking for MC-CDMA signals”, *European Trans. Commun.*, vol. 15, n. 3, May 2004.

**REFERRED
CONFERENCE
PUBLICATIONS**

[C23] M. Monti, **L. Sanguinetti**, C. Tschudin, M. Luise, “Chemistry-Inspired Algorithm for Emergent Distributed Consensus in WSNs”, in the *7th International Workshop on Wireless Sensor, Actuator and Robot Networks (WiSARN 2013-Spring)*, Cambridge, Massachusetts, USA, May 2013.

[C22] G. Bacci, **L. Sanguinetti**, M. Luise, H.V. Poor “Energy-Efficient Contention-Based Synchronization in OFDMA Systems with Discrete Powers and Limited Feedback”, in the *IEEE Wireless Communications and Networking Conference*, Shanghai, China, April 2013.

[C21] G. Bacci, **L. Sanguinetti**, M. Luise, H. V. Poor, “Improving the Energy Efficiency of Contention-Based Synchronization in OFDMA Networks”, in the *50th Annual Allerton Conference on Communication, Control, and Computing*, Allerton, Illinois, USA, October, 2012.

[C20] J. Gomes, F. Pacini, M. Luise, G. Bacci, **L. Sanguinetti**, M. Zorzi, P. Casari, H. Wymeersch, C. Laot, S. Houcke, O. Kebkal, B. Tevene, “An overview of project COMPOUND: Cooperative communications and positioning in mobile underwater networks”, in the *Future Network and Mobile Summit (FutureNetw 2012)*, Berlin, Germany, July 2012.

[C19] G. Bacci, **L. Sanguinetti**, M. Greco, M. Luise, “A Game-Theoretic Approach for Energy-Efficient Detection in Radar Sensor Networks”, in the *IEEE Sensor Array and multichannel signal processing workshop (SIAM’12)*, 2012.

[C18] **L. Sanguinetti**, A. A. D’Amico, “Power Allocation in Two-Hop Amplify-and-

- Forward MIMO Relay Systems with QoS requirements”, in the *IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP'11)*, Puerto Rico, 2011.
- [C17] **L. Sanguinetti**, M. Morelli, “An Initial Ranging Scheme for IEEE 802.16 based OFDMA Systems”, in the *IEEE International Workshop on Multi-Carrier Systems and Solutions (MCSS'11)*, 2011.
- [C16] **L. Sanguinetti**, M. Morelli, G. Imbarlina, “A Practical Algorithm for CFO Recovery in OFDM-based Cognitive Radio Systems”, in the *IEEE International Workshop on Signal Processing Advances for Wireless Communications (SPAWC'09)*, Perugia, 2009.
- [C15] **L. Sanguinetti**, M. Morelli, H. V. Poor, “An Improved Scheme for Initial Ranging in OFDMA-based Networks”, in the *IEEE International Conference on Communications (ICC'08)*, Beijing, 2008.
- [C14] **L. Sanguinetti**, A. A. D'Amico, I. Cosovic, “On the Performance of Cancellation Carrier-based schemes for Sidelobe Suppression in OFDM networks”, in the *IEEE International Vehicular Technology Conference (VTC'08)*, Marina Bay, Singapore, 2008.
- [C13] **L. Sanguinetti**, M. Morelli, H. V. Poor, “An ESPRIT-based Approach for Initial Ranging in OFDMA systems”, in the *IEEE Workshop on Signal Processing Advances for Wireless Communications (SPAWC'08)*, Recife, Pernambuco, Brasil, 2008.
- [C12] **L. Sanguinetti**, M. Morelli, A. Tyrell, A. Gunther, “On the Performance of Biologically-Inspired Slot Synchronization in Multicarrier Ad Hoc Networks”, in the *IEEE Vehicular Technology Conference (VTC'08)*, Marina Bay, Singapore, 2008.
- [C11] A. A. D'Amico, M. Morelli, **L. Sanguinetti**, “DOA Estimation for MC-CDMA Uplink Transmissions”, in the *IEEE International Workshop on Multi-Carrier Systems and Solutions (MCSS'07)*, Herrsching, Germany, 2007.
- [C10] **L. Sanguinetti**, M. Morelli, “Non-Linear Pre-Coding for MIMO Multi-User Downlink Transmissions with Different QoS Requirements”, in the *European Signal Processing Conference (EUSIPCO'06)*, Florence, Italy, 2006.
- [C9] U. Mengali, M. Morelli, **L. Sanguinetti**, “Parameter Estimation for Interference Cancellation in Power-Controlled MC-CDMA Downlink Transmissions”, in the *IEEE International Workshop on Multi-Carrier Systems and Solutions (MCSS'05)*, Herrsching, Germany, 2005.
- [C8] **L. Sanguinetti**, I. Cosovic, “On the peak-to-average power ratio of pre-equalized multi-carrier code-division multiple-access transmissions”, in the *IEEE Vehicular Technology Conference (VTC'05)*, Stockholm, Sweden, 2005.
- [C7] **L. Sanguinetti**, I. Cosovic and M. Morelli, “MMSE Pre-Filtering techniques for Downlink MC-CDMA transmissions”, in the *IEEE Vehicular Technology Conference (VTC'05)*, Stockholm, Sweden, 2005.
- [C6] T. Mazzoni, **L. Sanguinetti**, M. Morelli, “Channel Estimation in the Presence of Timing Offsets for MC-CDMA Uplink Transmissions with Combined Equaliza-

tion”, in the *IEEE International Workshop on Multi-Carrier Systems and Solutions (MCSS'05)*, Herrsching, Germany, 2005.

[C5] **L. Sanguinetti**, M. Morelli, I. Cosovic, “Non-linear Pre-Filtering Techniques for MC-CDMA Downlink Transmissions”, in the *IEEE Global Telecommunications Conference (Globecom'05)*, St. Louis, Missouri, 2005.

[C4] **L. Sanguinetti**, M. Morelli, “Multiuser Channel Estimation and Tracking for MC-CDMA Uplink Transmissions”, in the *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'05)*, Berlino, 2005.

[C3] M. Morelli, **L. Sanguinetti**, “Estimation of Channel Statistics for Iterative Detection of OFDM Signals”, in the *IEEE International Conference on Communications (ICC'04)*, Parigi, 2004.

[C2] P. Bisaglia, **L. Sanguinetti**, M. Morelli, N. Benvenuto, S. Pupolin, “Pre-equalization techniques for downlink and uplink TDD MC-CDMA systems”, in the *IEEE International Symposium on Wireless Communications*, Abano Terme, Padova, 2004.

[C1] **L. Sanguinetti**, M. Morelli, U. Mengali, “Space-Time Multi-User Detection for MC-CDMA Systems in the Presence of Channel Estimation Errors”, in the *IEEE International Workshop on Multi-Carrier Systems and Solutions (MCSS'03)*, Oberpfaffenhofen, Germany, 2003.

TECHNICAL REPORTS

[T13] M. Morelli, **L. Sanguinetti**, M. Moretti, “*SWING: Radio network system design*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2012.

[T12] M. Morelli, **L. Sanguinetti**, M. Moretti, “*SWING: Definition of the high survival HF radio network technical requirements*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2012.

[T11] **L. Sanguinetti**, M. Di Dio, M. Luise, “*LICOLA: Physical-layer security techniques for wireless communications*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2012.

[T10] L. Taponecco, **L. Sanguinetti**, M. Morelli, “*SANDRA D6.2.3 Report on Long Term AeroMACS Evolution*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2012.

[T9] L. Taponecco, **L. Sanguinetti**, M. Morelli, “*SANDRA WP6.2.3 Technical Document on Channel Estimation Issues*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2011.

[T8] **L. Sanguinetti**, M. Morelli, “*SANDRA WP6.2.3 Technical Document on Synchronization Issues*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2009.

[T7] **L. Sanguinetti**, M. Morelli, “*Towards multi-carrier based cognitive radio: resolving PHY layer issues. Timing Synchronization in a multicarrier ad-hoc network*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2007 (confidential restricted).

[T6] **L. Sanguinetti**, A. A. D'Amico, “*Towards multi-carrier based cognitive radio: resolving PHY layer issues. On the performance of cancellation carrier-based schemes for sidelobe suppression in OFDM networks*”, Dipartimento di Ingegneria

dell'Informazione, Pisa, 2007 (confidential restricted).

[T5] **L. Sanguinetti**, “*Frequency domain equalization in asynchronous multiuser MIMO OFDM networks*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2007 (confidential restricted).

[T4] **L. Sanguinetti**, and M. Moretti “*Space-time receiver for HSDPA systems with spatial division multiplexing*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2007 (confidential restricted).

[T3] **L. Sanguinetti**, M. Morelli, M. Moretti, A. A. D'Amico, U. Mengali, “*RF pre-processing for High Throughput WLAN/IEEE 802.11n*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2006 (confidential restricted).

[T2] **L. Sanguinetti**, M. Morelli, M. Moretti, A. A. D'Amico, U. Mengali, “*Transmit Diversity Techniques for MIMO-OFDM Transmissions*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2006 (confidential restricted).

[T1] **L. Sanguinetti**, M. Morelli, M. Moretti, A. A. D'Amico, U. Mengali, “*MIMO-OFDM Transmissions over Frequency Selective Channels*”, Dipartimento di Ingegneria dell'Informazione, Pisa, 2006 (confidential restricted).

**COMPUTER
SKILLS**

Languages & Software: Java, C, C++, FORTRAN, MATLAB.
Operating Systems: Windows, Mac OS X.

**EXTRA-
CURRICULAR
ACTIVITIES**

Semi-professional basketball player
Multidiscipline athlete