



# Stefano Tomasin

Assistant Professor

**Address:** Department of Information Engineering  
University of Padova  
Via Gradenigo 6/B  
35131 Padova  
Italy

Tel: +39-049-827 7917  
Fax: +39-049-827 7699  
Skype: stefano.tomasin  
E-mail: [tomasin@dei.unipd.it](mailto:tomasin@dei.unipd.it)  
[tomasin@ieee.org](mailto:tomasin@ieee.org)  
URL: <http://www.dei.unipd.it/~tomasin>

*Last updated in March 2010*

---

## Short Biography



Stefano Tomasin (b. July, 26, 1975) received the MS (Laurea) and PhD degrees in Telecommunications Engineering from the University of Padova, Italy, in 1999 and 2003, respectively. In 2001-2002 he was visiting Philips Research Laboratory in Eindhoven, the Netherlands, studying mobile receivers for the digital terrestrial television. In 2002 he joined University of Padova first as contract researcher for a national research project and then, since 2005, as assistant professor. In the second half of 2004 he was visiting faculty at Qualcomm, San Diego (CA) within a project on the multiuser detection for cellular systems. In 2007 he was visiting Polytechnic University, Brooklyn, NY, doing research on cooperative networks. His current research interests include signal processing for wireless communications, access technologies for multiuser/multi-antenna systems and cross-layer protocol design and evaluation. He is member of IEEE since 1999.

---

## Current Public Projects

**Progetto di ricerca di Ateneo (2009-2011)** Design and implementation of a novel control and communication architecture for cooperative operation of distributed harmonic and reactive compensators

**Network of Excellence in Wireless Communications (NEWCOM++)** NEWCOM++ (Network of Excellence in Wireless COMMunications) european project (2006-2009) within FP7, prosecution of the NEWCOM project.

---

## Industry Projects

**2004 – today**

Principal investigator in various private consultancy projects for Italian and International companies on various subjects including terrestrial digital television standard of current and next generation, receiver design for next generation cellular systems, multicarrier systems for ad hoc networks.



## **Industrial and Academic Relations**

<b>Ecole Polytechnique Fédérale de Lausanne</b>	Collaborating ( <i>Feb. 2009-Feb. 2010</i> ) on the project <i>DVB-T2 advanced software platform</i> (DASP) on synchronization issues for new generation digital video broadcasting.
<b>Polytechnic University, Brooklyn, NY</b>	Visiting faculty ( <i>Sept. 2007–Dec. 2007</i> ). Main research activity: cooperative networks; single carrier modulation with frequency domain equalization for long term evolution of 3GPP; security in cooperative networks; analysis of cooperative MIMO networks..
<b>Qualcomm inc., San Diego, CA</b>	Visiting faculty ( <i>June 2004–Dec. 2004</i> ) under the supervision of Dr. Roberto Padovani on multiuser detection for the uplink of cellular systems based on CDMA technology.
<b>Philips Research Lab., Eindhoven, The Netherlands</b>	Internship during the Ph.D. program ( <i>Oct. 2001 – Jun. 2002</i> ) at Eindhoven (NL) within a project on Doppler compensation for OFDM with application to mobile digital terrestrial television receivers.
<b>IBM Zurich Research Lab., Zurich, Switzerland</b>	Post-master internship ( <i>Oct. 1999 – Jan. 2000</i> ) on a project for the performance evaluation of error control coding for magnetic recording systems.

---

## **Past Public Projects**

<b>Reconfigurable architectures for 4G systems.</b>	Project of the Italian ministry for the university within the FIRB (Fund for the investments on basic research) program (2003-2005). <a href="http://primo.ismb.it">http://primo.ismb.it</a>
<b>Network of Excellence in Wireless Communications (NEWCOM)</b>	NEWCOM (Network of Excellence in Wireless COMmunications) project on mobile and wireless systems beyond 3G. <a href="http://newcom.ismb.it/">http://newcom.ismb.it/</a>
<b>MC-CDMA: An Air Interface for the 4th Generation of Wireless Systems</b>	Project of the Italian ministry for the university with the PRIN program (2002).

---

## **Professional Achievements**

<b>Teaching experience</b>	<ul style="list-style-type: none"><li>✓ Sistemi di Telecomunicazioni for graduate students (2008-today)</li><li>✓ Fondamenti di comunicazioni (Fundamentals of communications) for graduate students (2005-2009)</li><li>✓ Multicarrier systems, for doctoral students (2005).</li><li>✓ Broadband Wireless Communications for the NEWCOM Doctoral School in Wireless Communications (2006)</li></ul>
<b>Services to the community</b>	<ul style="list-style-type: none"><li>✓ Referee for various international Journals and Conferences.</li><li>✓ TPC member of VTC2008-Spring, for Mobile / Wireless</li></ul>



Networks and Systems.

- ✓ TPC member of Globecom 2007.
- ✓ Chairman at the IEEE Vehicular Technology Conference (2004) Fall, Milan, Italy.

## Awards

- ✓ *Premio Carlo Offelli 2005*: awarded best young researcher at the Department of Information Engineering, University of Padova.
- ✓ *Premio Regionale per l'Innovazione 2004*: awarded best doctoral thesis.
- ✓ *Premio Carlo Offelli 2003*: Nominated among the best five young researcher at the Department of Information Engineering, University of Padova.



## Publications

### *International Journals*

1. S. Dehnie and S. Tomasin, "Detection of selfish nodes in networks using CoopMAC protocol with ARQ," accepted *IEEE Trans. Wireless Commun.*, Feb. 2009.
2. E. Conte, S. Tomasin and N. Benvenuto, "A simplified greedy algorithm for joint scheduling and beamforming in multiuser MIMO OFDM," *accepted IEEE Commun. Letters*, Sep. 2009.
3. S. Tomasin and M. Butussi, "Analysis of interpolated channel estimation for mobile OFDM systems," *accepted IEEE Trans. Commun.*, Aug. 2009.
4. M. Rotoloni, S. Tomasin and L. Vangelista, "On correlation-based synchronization for DVB-T2," *IEEE Commun. Letters*, vol. 14, no. 3, pp. 248 – 250, Mar. 2010.
5. N. Benvenuto, R. Dinis, D. Falconer, and S. Tomasin, "Single carrier modulation with nonlinear frequency domain equalization: an idea whose time has come – again," *Proc. of IEEE*, vol. 98, no. 1, Jan. 2010, pp. 69 – 96.
6. M. Rotoloni, M. Butussi, S. Tomasin, M. Lattuada and C. Ruppert, "Multiple adaptive frequency filtering for OFDM channel estimation," *IEEE Trans. Broadcasting*, vol. 55, no. 4, pp. 826 – 830, Dec. 2009.
7. L. Vangelista, N. Benvenuto, S. Tomasin, C. Nokes, J. Stott, A. Filippi, M. Vlot, V. Mignone, and A. Morello, "Key technologies for next generation terrestrial digital television standard DVB-T2," *IEEE Commun. Mag.*, vol. 47, no. 10, pp. 146-153, Oct. 2009.
8. M. Trivellato, S. Tomasin and N. Benvenuto, "On channel quantization and feedback strategies for multiuser MIMO-OFDM downlink systems," *IEEE Trans. Commun.*, vol. 57, no. 9, pp. 2645-2654, Sept. 2009.
9. A. Vigato, S. Tomasin, L. Vangelista, V. Mignone, N. Benvenuto and A. Morello, "Coded decision directed demodulation for second generation digital video broadcasting standard," *IEEE Trans. Broadcasting*, vol. 55, no. 3, pp. 607 – 615, Sept. 2009.
10. T. Erseghe and S. Tomasin, "Optimization of UWB WPAN receiver in the presence of multiuser interference," *IEEE Trans. Commun.*, vol. 57, no. 8, pp. 2369-2379, Aug. 2009.
11. S. Tomasin, M. Levorato and M. Zorzi, "Steady state analysis of coded cooperative networks with HARQ protocol," *IEEE Trans. Commun.*, vol. 57, no. 8, pp. 239-2401, Aug. 2009.
12. N. Benvenuto, A. Goliahani, S. Tomasin and L. Vangelista, "Superimposed sequence vs pilot aided channel estimations for next generation DVB-T systems," *IEEE Trans. Broadcasting*, vol. 55, no. 1, pp. 140-144, Mar. 2009.
13. M. Levorato, S. Tomasin and M. Zorzi, "Cooperative spatial multiplexing for ad hoc networks with hybrid ARQ: system design and performance analysis," *IEEE Trans. Commun.*, vol. 56, no.9, pp.1545-1555, Sep. 2008.
14. S. Tomasin, D. Veronesi and N. Benvenuto, "Cross-layer optimization for multimedia traffic in CDMA cellular networks," *IEEE Trans. Wireless Commun.*, vol. 7, no. 4, pp. 1379-1389, Apr. 2008.
15. M. Levorato, S. Tomasin, P. Casari and M. Zorzi, "Physical layer approximations for cross-layer performance analysis in MIMO-BLAST ad hoc networks," *IEEE Trans. Wireless Commun.*, vol. 6, no. 12, pp. 4390-4400, Dec. 2007.
16. S. Tomasin and F. Tosato, "Interference resilient block-spreading CDMA with minimum MAI sequence design," *IEEE Trans. Commun.*, vol. 55, no. 9, pp. 1783-1792, Sept. 2007.
17. N. Benvenuto, G. Carnevale and S. Tomasin, "Joint power control and receiver optimization of CDMA transceivers using successive interference cancelation," *IEEE Trans. Commun.*, vol. 55, no. 3, pp. 563-573, Mar. 2007.
18. S. Tomasin and D. Veronesi, "Generalized self spread-spectrum communications with turbo soft despreading and decoding," *Journal of Commun. and Networks*, vol. 8, no. 3, pp. 267-274, Sept. 2006.
19. S. Tomasin, "Efficient bidirectional DFE for doubly selective wireless channels," *EURASIP Journal on Applied Signal Processing*, vol. 2006, Article ID 70572, pp. 1-10, 2006.
20. J. Hou, J. E. Smee, H. Pfister, S. Tomasin, "Implementing interference cancellation to increase the EV-DO RevA reverse link capacity," *IEEE Commun. Mag.*, vol. 44, no. 2, pp. 96-102, Feb. 2006.
21. N. Benvenuto and S. Tomasin, "Iterative design and detection of a DFE in the frequency domain," *IEEE Trans. on Commun.*, vol. 53, no. 11, pp. 1867-1875, Nov. 2005.



22. S. Tomasin and N. Benvenuto, "Frequency-domain interference cancellation and non-linear equalization for CDMA systems," *IEEE Trans. Wireless Commun.*, vol. 4, no. 5, pp. 2329-2339, Sept. 2005.
23. S. Tomasin, A. Gorokhov, H. Yang and J. P. Linnartz, "Iterative interference cancellation and channel estimation for mobile OFDM," *IEEE Trans. Wireless Commun.*, vol. 4, no. 1, pp. 238-245, Jan. 2005.
24. N. Benvenuto and S. Tomasin, "Block iterative DFE for single carrier modulation," *IEE Electronics Letters*, vol. 38, no. 19, pp. 1144-1145, Sept. 2002.
25. N. Benvenuto, L. Tomba and S. Tomasin, "Equalization methods in OFDM and FMT systems for broadband communication," *IEEE Trans. Commun.*, vol. 50, no. 9, pp. 1413-1418, Sept. 2002.
26. N. Benvenuto, S. Tomasin, "On the comparison between OFDM and single carrier modulation with a DFE using a frequency domain feedforward filter," *IEEE Trans. Commun.*, vol. 50, no. 6, pp. 947-955, June 2002.

### **International Patents**

1. Method for channel estimation in OFDM systems, WO 2008 129047, Sep. 2008.
2. Adaptation of transmit subchannel gains in a system with interference cancellation, WO 2006/071760, July 2006. Also published as US2006142041.
3. Joint interference cancellation of pilot, overhead and traffic channels, WO 2006/071761, July 2006. Also published as US2006141935.
4. Traffic interference cancellation, WO 2006/072086, July 2006. Also published as US2006141934.
5. Channel estimation for interference cancellation, WO 2006/072088, July 2006. Also published as US2006141933 (A1).
6. Frequency-domain decision feedback equalizing device and method, WO 2004/021657, March 2004. US extension: US 2005259727, Nov. 2005.
7. Frequency-domain multi-user access interference cancellation and nonlinear equalization in CDMA receivers, US 2005249269, Nov. 2005.
8. Fliterbank modulation system with pre-equalization, WO 2004/023750, EP 1537708, Mar/June 2005. US extension : US 2005259755, Nov. 2005.
9. Frequency-domain multi-user access interference cancellation and nonlinear equalization in CDMA receivers, US 2005249269, Nov. 2005.
10. Fliterbank modulation system with pre-equalization, WO 2004/023750, EP 1537708, Mar/June 2005. US extension : US 2005259755, Nov. 2005.

### **International Conferences**

#### **Invited Conferences**

1. S. Tomasin and M. Butussi, "DVB-T2: Key Technologies and Implementation Issues", Tutorial presentation at *IEEE Int. Conf. on Commun. (ICC)*, Dresden (Germany), June 2009.
2. M. Levorato, S. Tomasin and M. Zorzi, "Recursive analysis of ad hoc networks with packet queueing, channel contention and Hybrid ARQ," in *Proc. 2008 Information Theory and Applications Workshop*, San Diego, CA, *invited paper*, Jan. 2008.
3. S. Tomasin and N. Benvenuto, "Equalization and multiuser interference cancellation in CDMA systems," in *Proc. Wireless Personal Mobile Communication summit (WPMC 2003)*, Yokosuka, Japan, *invited paper*, Oct. 2003.

#### **Other Conferences**

4. E. Conte, A. Filippi and S. Tomasin, "Heart rate estimation using ultra wide band pulse radar," in *Proc. IASTED International Conference on Biomedical Engineering (BioMed)*, Innsbruck, Austria, Feb. 2010.



5. E. Conte, A. Filippi and S. Tomasin, "On the modulation of ultra wide band pulse radar signal by target vital signs," in *Proc. Int. Symp. Bioelectronics and Bioinformatics (ISBB2009)*, Melbourne, Australia, Dec. 2009 (*best student paper award to E. Conte*).
6. P. Baracca, S. Tomasin, L. Vangelista, N. Benvenuto and A. Morello, "Per sub-block equalization and channel estimation for next generation handheld DVB," in *Proc. Int. Conf. Ultra Modern Telecom. (ICUMT)*, St. Petersburg (Russia), Sep. 2009.
7. A. Vigato, N. Benvenuto, S. Tomasin and L. Vangelista, "On hard and soft detection of space-time block codes by a novel soft output sphere decoder," in *Proc. Int. Conf. Ultra Modern Telecom. (ICUMT)*, St. Petersburg (Russia), Sep. 2009.
8. S. Dehnie and S. Tomasin, "Selfish Misbehavior Detection in CSMA Cooperative Networks with HARQ," in *Proc. IEEE Int. Conf. Wireless and Mobile Comp., Net. and Commun. (WiMob 2009)*, Marrakech (Morocco), Oct. 2009.
9. S. Dehnie, S. Tomasin and R. Ghandan, "Sequential detection of misbehaving nodes in cooperative networks with HARQ," in *Proc. IEEE Military Communications Conference (MILCOM)*, Boston (MA), Oct. 2009.
10. M. Rotoloni, M. Butussi, S. Tomasin, M. Lattuada and C. Ruppert, "Multiple adaptive frequency filtering for OFDM channel estimation," in *Proc. IEEE Int. Workshop Signal Proc. Advances in Wireless Commun. (SPAWC)*, Perugia, Italy, June 2009.
11. S. Tomasin and M. Butussi, "Improved channel duration estimate for mobile OFDM systems", in *Proc. IEEE Int. Workshop Signal Proc. Advances in Wireless Commun. (SPAWC)*, Perugia, Italy, June 2009.
12. K. Bakanoglu, E. Erkip and S. Tomasin, "Resource allocation for the parallel relay channel with multiple relays," in *Proc. Asilomar Conf. Signals, Systems and Computers*, Pacific Grove, CA, Oct. 2008.
13. M. Trivellato, S. Tomasin and N. Benvenuto, "Channel quantization and feedback optimization in multiuser MIMO-OFDM downlink systems," in *Proc. IEEE Global Commun. Conf. (GLOBECOM)*, New Orleans, LA, Nov. 2008.
14. E. Conte, S. Tomasin and N. Benvenuto, "Scheduling strategies for multiuser MIMO OFDM systems with limited feedback," in *Proc. Personal Indoor Mobile Radio Commun. (PIMRC)*, Cannes, France, Sept. 2008.
15. S. Dehnie and S. Tomasin, "Detection of selfish partners by control packets in ARQ-based CSMA cooperative networks," in *Proc. Int. Symp. Spread Spectrum Tech. and Applications (ISSTA)*, Bologna, Italy, Aug. 2008.
16. A. Vigato, S. Tomasin, L. Vangelista, N. Benvenuto and V. Mignone, "Soft detection of modulation diversity schemes for next generation digital terrestrial television," in *Proc. Int. Symp. Spread Spectrum Tech. and Applications (ISSTA)*, Bologna (Italy), Aug. 2008.
17. T. Erseghe and S. Tomasin, "Optimized demodulation for MAI resilient UWB W-PAN receivers," in *Proc. Int. Conf. Commun. (ICC)*, Beijing, China, June 2008.
18. N. Benvenuto, A. Goljahani, S. Tomasin and L. Vangelista, "Superimposed sequence channel estimation and pilot aided channel estimation: a throughput comparison," in *Proc. 10th Int. Symp. on Wireless Personal Multimedia Commun. (WPMC)*, Jaipur, India, Dec. 2007.
19. N. Benvenuto, E. Conte, S. Tomasin and M. Trivellato, "Predictive channel quantization and beamformer design for MIMO-BC with limited feedback," in *Proc. Global Conf. On Commun. (GLEBECOM)*, Washington, D.C., Nov 2007.
20. N. Benvenuto, E. Conte, S. Tomasin and M. Trivellato, "Low-rate predictive feedback for the OFDM MIMO broadcast channel," in *Proc. Tyrrhenian Workshop on Digital Communications 2007 (TIWDC 2007)*, Ischia island, Naples, Italy, Sept. 2007.
21. N. Benvenuto, E. Conte, S. Tomasin and M. Trivellato, "Low-rate feedback and channel quantization for the MIMO broadcast channel," in *Proc. IEEE Africon'07*, Windhoek, Namibia, Sept. 2007.
22. S. Tomasin, M. Levorato and M. Zorzi, "Analysis of outage probability for cooperative networks with HARQ," in *Proc. Int. Symp. On Information Theory (ISIT) 2007*, Nice, France, June 2007.
23. M. Levorato, S. Tomasin and M. Zorzi "Strategies and tradeoffs for coded cooperation in wireless networks" in *Proc. Workshop on Wireless Networks, Commun. Cooperation and Competition (WNC3) 2007*, Limassol, Cyprus, Apr. 2007.
24. M. Levorato, S. Tomasin and M. Zorzi, "Coded cooperation for ad hoc networks with spatial multiplexing," in *Proc. IEEE Int. Conf. on Commun. (ICC) 2007*, Glasgow, Scotland, June 2007.



25. N. Benvenuto, S. Tomasin and D. Veronesi, "Multiple frequency offsets estimation and compensation for cooperative networks," in Proc. *IEEE Wireless Commun. And Networking Conf. (WCNC)*, Hong-Kong, China, Mar. 2007.
26. S. Tomasin, M. Levorato, M. Zorzi, "Analysis of cooperative spatial multiplexing for ad hoc networks with adaptive hybrid ARQ," in Proc. *Vehic. Tech. Conf. (VTC) fall*, Montreal, Canada, Sept. 2006.
27. N. Benvenuto, G. Carnevale and S. Tomasin, "MC-CDMA with SIC: power control by discrete stochastic approximation and comparison with OFDMA," in Proc. *Int. Conf. on Commun. (ICC)*, Istanbul, Turkey, June 2006.
28. M. Levorato, S. Tomasin, P. Casari and M. Zorzi, "An approximate approach for layered space-time multiuser detection performance and its application to MIMO ad hoc networks," in Proc. *Int. Conf. on Commun. (ICC)*, Istanbul, Turkey, June 2006.
29. M. Levorato, S. Tomasin, P. Casari, M. Zorzi, "Analysis of spatial multiplexing for cross-layer design of MIMO ad-hoc networks," in Proc. *Vehic. Tech. Conf. (VTC) spring*, Melbourne, Australia, May 2006.
30. N. Benvenuto, G. Carnevale and S. Tomasin, "Optimization of SIC receiver and CDMA power control by discrete stochastic approximation," in Proc. *Int. Conf. on Information, Commun. and signal proc.*, Bangkok, Thailand, Dec. 2005.
31. S. Tomasin and F. Tosato, "Throughput efficient block-spreading CDMA: sequence design and performance comparison" in Proc. *Globecom 2005*, St. Luis, MO, Nov. 2005.
32. S. Tomasin, "Overlap and save frequency domain DFE for throughput efficient single carrier transmission" in Proc. *PIMRC 2005*, Berlin, Germany, Sept. 2005.
33. S. Tomasin, G. Carnevale and N. Benvenuto, "Optimum power control and ordering in SIC receivers for uplink CDMA systems" in Proc. *ICC 2005*, Seul (Korea), Jun 2005.
34. N. Benvenuto, G. Carnevale and S. Tomasin, "Energy optimization of CDMA transceivers using successive interference cancellation" in Proc. *Globecom 2004*, Dallas, TX, Nov. 2004.
35. S. Tomasin and D. Veronesi, "Soft turbo despreading and decoding for self spread-spectrum communications" in Proc. *VTC Fall 2004*, Los Angeles, CA, Sept. 2004.
36. S. Tomasin and N. Benvenuto "A reduced complexity block iterative DFE for dispersive wireless applications", in Proc. *VTC 2004 Fall*, Los Angeles, CA, Sept. 2004.
37. S. Tomasin, "Self spread-spectrum and successive interference cancellation for broadband wireless transmissions ," in Proc. *VTC 2004 Spring*, Milan, Italy, May 2004
38. N. Benvenuto and S. Tomasin, "A dynamic rate uplink multiple access scheme based on FMT modulation," in Proc. *VTC 2004 Spring*, Milan, Italy, May 2004.
39. S. Tomasin and N. Benvenuto, "Performance comparison of frequency domain equalizers for the IEEE 802.16a WMAN standard," in Proc. *Int. Conf. on Info. and Comm. Tech.*, Damascus, Syria, Apr. 2004.
40. N. Benvenuto and S. Tomasin, "Iterative decoding and decision feedback equalization in the frequency domain," in Proc. *IEEE IST 2003*, Theran, Iran, Sept. 2003.
41. J. P.Linnartz, A. Gorokhov, S. Tomasin, H. Yang, "Achieving mobility for DVB-T by signal processing for Doppler compensation," in Proc. *IBC Conference*, pp. 412-420, Amsterdam, The Netherlands, Sept. 2002.
42. N. Benvenuto and S. Tomasin, "Efficient pre-coding schemes for FMT broadband wireless systems," in Proc. *Personal Indoor Mobile Radio Communications*, pp. 1493-1497, Lisboa, Portugal, Sept. 2002.
43. S. Tomasin, A. Gorokhov, H. Yang and J.P. Linnartz, "Reduced complexity Doppler compensation for mobile DVB-T.," in Proc. *Personal Indoor Mobile Radio Communications*, pp. 2077-2081, Lisboa, Portugal, Sept. 2002.
44. N. Benvenuto and S. Tomasin, "Transmit gain optimization for space time block coding wireless systems with co-channel interference," in Proc. *IST Mobile & Wireless Telecommunications Summit 2002*, Thessaloniki, Greece, June 2002.
45. N. Benvenuto and S. Tomasin, "Transmit diversity schemes for broadband wireless systems with co-channel interference ," in Proc. *IEEE Benelux Signal Processing Symposium*, Leuven, Belgium, Mar. 2002.
46. N. Benvenuto and S. Tomasin, "Frequency domain DFE: system design and comparison with OFDM," in Proc. *IEEE 8th Symposium on Commun. and Vehic. Tech. in the Benelux*, Delft, The Netherlands, Oct. 2001.
47. N. Benvenuto and S. Tomasin, "Channel estimators with reduced complexity for multicarrier systems," in Proc. *IEEE IST 2001*, Tehran, Iran, Sept. 2001.



48. R. Cideciyan, E. Eleftheriou and S. Tomasin, "Performance analysis of magnetic recording systems," in Proc. *IEEE ICC 2001*, Helsinki (Finland), vol. 9, pp. 2711-2715, June 2001.
49. N. Benvenuto, S. Tomasin, L. Tomba, "Receiver architectures for FMT broadband wireless systems," in Proc. *IEEE 53rd VTC Spring*, Rhodes Island, Greece, vol. 1, pp. 643-647, May 2001.