

BIOGRAPHICAL DATA

Name: **Simone Garatti**
Place and date of birth: **Brescia, August 21, 1976**
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CURRENT POSITION

Assistant professor at the Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano (research field: Automatic Control).

PAST POSITIONS

August-September 2006: visiting scholar at the University of California San Diego (UCSD), San Diego, CA, USA.

March-December 2004: post-doc at the Dipartimento di Elettronica ed Informazione, Politecnico di Milano, Milan, Italy.

August 2003: visiting student at the Lund Institute of Technology, Lund, Sweden.

March 2001 - February 2004: Ph.D. student at the Dipartimento di Elettronica ed Informazione, Politecnico di Milano, Milan, Italy.

EDUCATION

Ph.D. *cum laude* in Information Technology Engineering from the Politecnico di Milano, 2004.

M.Sc. *cum laude* in Computer Science Engineering from the Politecnico di Milano, 2000.

RESEARCH ACTIVITY

Resolution of robust optimization problems in systems and control by means of randomized techniques

DESCRIPTION: Many problems in systems and control are formulated or can be reformulated as constrained convex optimization problems, and, as such, are amenable of resolution via convex optimization techniques. However, the presence of an uncertain element, like e.g. an uncertain parameter of the system transfer function, may lead to an infinite amount of constraints, one for each value the uncertain element can take. In this case the optimization problem is called robust and, although, the vast majority of problems in systems and control can be casted in the robust optimization framework, the resolution of these types of problems is often impractical. In many cases, robust optimization has been proven even NP-hard.

The fundamental idea developed along this line of research is that of considering a new optimization problem with a finite number of constraints, obtained by extracting at random a finite number of instances of the uncertain element (scenario approach, see [1-5]). The obtained optimization problem can be solved by means of standard convex optimization techniques, at a relatively low computational effort. Moreover, its solution is robust not only for the extracted constraints but also for a large amount of the other, unseen, ones. This latter is the major achievement of this research activity, and the number of extractions that are strictly required to guarantee a chosen level of robustness was determined in [6].

Based on the result mentioned above, the research activity developed along two directions. On the one hand, the theoretical analysis was extended to comprise the case of constraint removal, which permits the user to modulate robustness in favor of performance, [2-3]. On the other hand, the scenario approach fostered the introduction of new paradigms in systems and control and the resolution of problems otherwise deemed intractable. In this respect, [7] deals with an innovative method to disturbance rejection in presence of input

saturation, while, in [4], interval predictor models are introduced and a theory of identification for these models is developed.

RESEARCH PRODUCTS

This research activity has led to a number of publications, among which a regular paper published in the Automatica Journal, a long paper published in the SIAM Journal on Optimization, and two conference papers associated to semi-plenary / plenary presentations (MTNS 2010, speaker: M.C. Campi - SYSID 2012, speaker: M.C. Campi). Moreover, Simone Garatti was invited lecturer of two international Ph.D. courses on the scenario approach (course "Randomization in Systems and Control Design: The Scenario Approach" - HYCON-ECCI Graduate School on Control 2012, Supélec, France, 13-17 February 2012 (in collaboration with M.C. Campi); course "Design in the presence of uncertainty: The Scenario Approach", 4th Modern Computational Science Summer School, Oldenburg, Germany, 30-31 Agosto 2012 (in collaboration with M. Prandini)). On the same topic, invited seminars at the Operational Research Center – MIT, Boston, MA, USA, and at the Department of Electrical and Computer Engineering – NorthEastern University, Boston, MA, USA were given too (in collaboration with M.C. Campi).

SELECTED PUBLICATIONS

1. S. Garatti, M. Prandini, "Design in presence of uncertainty: the scenario approach", in: "Modern Computational Science 12, Optimization" (eds. R. Leidl, A.K. Hartmann) – BIS-Verlag der Carl von Ossietzky Universität Oldenburg, 2012.
2. M. Campi, S. Garatti, "A sampling-and-discarding approach to chance-constrained optimization: feasibility and optimality", Journal on Optimization Theory and Applications, 148(2):257-280, 2011
3. M.C. Campi, S. Garatti "Variable robustness control: principles and algorithms" (seminary lecture), Proceedings of 19th International Symposium on Mathematical Theory of Networks and Systems (MTNS), Budapest, Hungary, 2010.
4. M. Campi, G. Calafiore, S. Garatti, "Interval predictor models: identification and reliability", Automatica (regular paper), 45(2): 382-392, 2009.
5. M. Campi, S. Garatti, M. Prandini, "The scenario approach for systems and control design", Annual Reviews in Control, 33(2):149-157, 2009.
6. M.C. Campi, S. Garatti, "The exact feasibility of randomized solutions of uncertain convex programs", SIAM Journal on Optimization, 19(3): 1211-1230, 2008.
7. M. Prandini, M. Campi, S. Garatti, "Controller design through random sampling: an example", in: "Advance in control theory and applications" (eds. C. Boniventi, A. Isidori, L. Marconi, C. Rossi) – Springer Verlag, LCNIS series, 2007.

White-box system identification

DESCRIPTION: One basic problem in system identification is that of estimating an unknown parameter in a given model from measurements of input/output data (white-box identification). Existing methods, like Kalman Filtering and PEM identification, may suffer from a high computational burden and the non-convergence of the estimate. In this respect, a tuning is required each time an estimate must be returned. In certain problems, however, this tuning is not possible. Think e.g. to the problem of estimating the parameters characterizing the behavior of a tire, where the estimator has to be implemented onboard as an electronic device. Clearly, the estimator must comply with parameter change, as due to tire consumption, without requiring any tuning of the device.

Within this research activity, a novel approach to parameter estimation, based on model simulation is proposed, [1]. The idea is that of generating via model simulation a number of possible values for the unknown parameter and the corresponding input/output data sequences. Then, based on this simulation-based data, the relationship between input/output data and the unknown parameter is established off-line. Clearly, this problem may be tough to solve and a two-stage approach is then proposed: in the first stage the

information carried by the simulated data sequences is compressed in artificial data so as to reduce the problem dimensionality; then, in the second stage, the relationship between artificial data and the parameter is established via standard nonlinear function fitting techniques.

Simulations revealed that the two-stage approach may offer valuable improvements with respect to other approaches and, currently, the method is used for the estimation of parameters of an industrial plant.

RESEARCH PRODUCTS

In addition to the paper reported below, the research activity led to a number of conference publications, among which a contribution associated to a plenary presentation (Chinese Control Conference 2012, speaker: S. Bittanti).

SELECTED PUBLICATIONS

1. S. Garatti, S. Bittanti "A new paradigm for parameter estimation in system modeling", Journal of Adaptive Control and Signal Processing, Published on-line, 2012.

System identification and model quality assessment

DESCRIPTION: Model quality assessment is a fundamental problem in system identification, since an identified model is of little use without an evaluation of the mismatch between the model and the true system generating the data. The most commonly used tool for evaluating the model error is the asymptotic theory of system identification, which returns ellipsoidal confidence regions for the system parameters. Yet, as is clear, guarantees hold true when the number of data points tends to infinite, so that, in practice, this theory has heuristic validity only. Despite the achieved results are correct in many cases, it may happen that, in presence of poor informative data, the returned confidence regions are completely unreliable, [3].

In this research activity, the conditions for the usability of the asymptotic theory have been critically discussed, both for prediction error methods (PEM), [3], and instrumental variable (IV) techniques, [2]. In both cases, a novel asymptotic theory, which holds under nonstandard assumptions comprising the case of non-informative data, has been developed, and, based on this theory the conditions the reliability of the asymptotic theory depends on have been spotted out. In particular, it has been shown that, though the asymptotic theory can be safely used for most of the usual model classes, in the case of Box-Jenkins models this is not true and some extra-care is needed to avoid unreliable results.

To prevent the drawbacks highlighted in [2-3], in [1] novel techniques based on data re-sampling have been introduced so as to reconstruct based on a finite number of data points a guaranteed estimate of the whole probability distribution function of the parameter vector returned by PEM identification.

RESEARCH PRODUCTS

The research activity led to a number of international conference and journal publications, among which two regular papers in the Automatica Journal.

SELECTED PUBLICATIONS

1. S. Garatti, R.R. Bitmead, "On resampling and uncertainty estimation in linear system identification", Automatica (regular paper), 46(5): 785-795, 2010.

2. S. Garatti, M. Campi, S. Bittanti, "The asymptotic model quality assessment for instrumental variable identification revisited", Systems & Control Letters, 55(6): 494-500, 2006.

3. S. Garatti, M. Campi, S. Bittanti, "Assessing the quality of identified models through the asymptotic theory – When is the result reliable?", Automatica (regular paper), 40(8): 1319-1332, 2004.

Iterative control design methods

DESCRIPTIONS: Iterative control has been widely studied in recent years as an efficient methodology for the design of high-performing controllers of complex plants. The idea behind iterative design is that, when the

plant is exceedingly complex, the design of the controller in one shot is hazardous. Instead, one can perform a sequence of closed-loop identification and controller design steps, aiming at progressively learning how to increase the control performance through experience.

Standard techniques have a major drawback: since the controller update is based on the last identified model only, some caution is needed at each iteration to avoid instability. In turn this implies that an excessive number of iterations is usually needed to eventually design the controller, leading to an expensive design procedure.

In this research activity, a new iterative control scheme, which explicitly accounts for the presence of uncertainty in the plant description (iterative robust control), has been introduced. In this scheme, at each iteration, a model of the plant is identified along with an evaluation of its uncertainty; the controller then is updated based both on the identified model and the estimated level of uncertainty. In this way, the performance improvement through steps can be speeded out, while, at the same time, preserving the robust stability of the closed-loop. This leads to an algorithm that is able to design high-performing controllers with a reduced number of experiments on the plant.

RESEARCH PRODUCTS

Besides the journal paper reported below, this research activity led to a number of conference papers.

SELECTED PUBLICATIONS

1. S. Garatti, M. Campi, S. Bittanti, "Iterative robust control: speeding up improvement through iterations", *Systems & Control Letters*, 59(2):139-146, 2010.

Data-mining

DESCRIPTION: Data-mining is an emerging topic in the field of identification, whose objective is that of finding hidden relationships among data in huge databases. A prototype problem is e.g. that of classifying customers based on a track of their purchases.

In this research activity, the focus was on the analysis of two datasets: one about the behavior of users in a Virtual Internet Community, [2], and one about the gene expression of a number of patients as measured through the DNA-microarrays technology, [1]. In the first case, the aim was that of finding the correlation between user profiles and kinds of navigations. In the second case, instead, the database referred to patients suffering from Leukemia, and the aim was that of classifying the disease based on gene expression only.

In both cases, unsupervised classification has been used so as to cluster the samples in a small number of representative categories and to simplify the subsequent information retrieval phase. Data pre-processing has been also used to improve the finally achieved results.

RESEARCH PRODUCTS

In addition to the papers reported below, this research activity led to some conference publications and to a contribution for the Encyclopedia of Data Warehousing and Mining.

SELECTED PUBLICATIONS

1. S. Garatti, S.M. Savaresi, S. Bittanti, L. La Brocca, "On the relationships between user profiles and navigation sessions in virtual communities: a data-Mining approach", *Intelligent Data Analysis*, 8(6): 579-600, 2004.
2. S. Garatti, S. Bittanti, D. Liberati, A. Maffezzoli, "An unsupervised clustering approach for leukaemia classification based on dna micro-arrays data", *Intelligent Data Analysis*, 11(2): 175-188, 2007.

COLLABORATIONS IN RESEARCH PROJECT

European research project N.HPRN-CT-1999-00046 "NACO: Nonlinear and Adaptive Control-Tools and Algorithms for the User" (duration: 54 months), 2001-2004.

National research project MIUR COFIN_2000 MM09198819_004 "Nuove tecniche per l'identificazione e il controllo adattativo nei sistemi industriali" (duration: 24 months), 2001-2002.

National research project MIUR COFIN_2002 2002094124_005 "Tecniche innovative per l'identificazione e il controllo adattativo nei sistemi industriali" (duration: 24 months), 2003-2004.

National research project MIUR PRIN_2006 2006094843_004 "Tecniche ed applicazioni innovative di identificazione e controllo adattativo" (duration: 24 months), 2007-2008.

National research project MIUR PRIN_2008 20085FFJ2Z_005 "Nuovi algoritmi ed applicazioni di identificazione e controllo adattativo" (duration: 24 months), 2010-2011.

European research project FP7 231143 "Echord: European Clearing House for Open Robotics Development" (duration: 42 months), 2011-2012.

Research project Regione Lombardia "GREEN MOVE" (duration: 24 months), 2011-2012.

European research project FP7 257005 "MoVeS: Modeling, Verification and Control of Complex System" (duration: 36 months), 2011-2013.

RESEARCH COLLABORATIONS WITH COMPANIES

Tiscali SpA (research contract "Comunità virtuali in Internet: ricerca delle relazioni tra i profili degli utenti e i loro percorsi di navigazione mediante tecniche di data-mining", February 5, 2002).

Whirlpool SpA (research contract "Tuning di modelli comportamentali per apparecchi elettrodomestici", November 26, 2004).

GRADUATE TEACHING AT FOREIGN UNIVERSITIES OR RESEARCH CENTERS

Lecturer of the course "Randomization in Systems and Control Design The Scenario Approach", HYCON-EECI Graduate School on Control 2012, Supélec, France, 13-17 February 2012 (in collaboration with M. Campi).

Lecturer of the course "Design in the presence of uncertainty: The Scenario Approach", 4th Modern Computational Science Summer School, Oldenburg, Germany, 30-31 August 2012 (in collaboration with M. Prandini).

VISITING PERIODS AT FOREIGN UNIVERSITIES OR RESEARCH CENTERS

August 2006 – September 2006: *visiting scholar* at the *Department of Mechanical and Aerospace Engineering, University of California San Diego, San Diego, CA, USA.*

August 2003: *visiting student* at the *Lund Institute of Technology, Lund, Sweden.*

AWARDS

2012: award for the best talk in the "Robust Control" session at the Convegno Annuale dei Docenti e Ricercatori Italiani in Automatica, Benevento, Italy, 2012.

2012: co-author of a plenary lecture contribution of the 16th IFAC Symposium on System Identification (plenary talk given by M.C. Campi).

2012: co-author of a plenary lecture contribution of the 31st Chinese Control Conference (plenary talk given by S. Bittanti).

2010: co-author of a semi-plenary lecture contribution of the 19th Symposium on Mathematical Theory of Networks and Systems (semi-plenary talk given by M.C. Campi).

2006: winner of a short-term mobility of researchers fellowship from the National Research Council of Italy (CNR) (visiting scholar at the University of California San Diego (UCSD), San Diego, CA, USA).

2005: outstanding reviewer of Automatica.

SCIENTIFIC ACTIVITY

2011- : member of the IFAC Technical Committee on Modeling, Identification, and Signal Processing.

2010- : member of the IEEE Control System Society Technical Committee on Computational Aspects of Control System Design.

Member of the:

- International Program Committee of the European Control Conference 2013.

- International Program Committee of the 9th International Conference on Computational Management Science, 2012.

- National Organizing Committee of the 18th IFAC World Congress, 2011.

- International Program Committee of the 48th IEEE Conference on Decision and Control, 2009.

December 2007: invited seminar at the *Operational Research Center – MIT*, Boston, MA, USA, and at the *Department of Electrical and Computer Engineering – North Eastern University*, Boston, MA, USA. (Talk entitled “The exact feasibility of randomized solutions to robust optimization: theory and applications”, in collaboration with prof. Marco Campi, Università di Brescia).

Simone Garatti served as a reviewer of many international journals (Automatica, IEEE Transactions on Automatic Control, IEEE Transactions on Circuits and Systems I, IET Control Theory and Applications, International Journal of Control and Signal Processing, International Journal of Robust and Nonlinear Control, Journal of complexity, Linear Algebra and its Applications, Mathematical Programming , SIAM Journal on Control and Optimization) and of many international conferences (EUCA European Control Conference, IEEE American Control Conference, IEEE Conference on Decision and Control, IEEE Multi-conference on Systems and Control, IFAC Symposium on System Identification, IFAC World Congress).

TEACHING ACTIVITY

2012: lecturer of the course “Adaptive systems and learning”, Politecnico di Milano (5 ETCS).

2010 - 2012: lecturer of the course “Model identification and data analysis – 2nd module”, Politecnico di Milano (15 ETCS).

2008 – 2012: lecturer of the course “Model identification and data analysis”, Politecnico di Milano (20 ETCS).

2008 - 2009: lecturer of the course “Progetto di Automatica – parte 2”, Politecnico di Milano (5 ETCS).

2005 – 2011: lecturer of the course “Sistemi adattativi ed ad apprendimento”, Politecnico di Milano (35 ETCS).

2005 – 2008: lecturer of the course “Identificazione dei modelli ed analisi dei dati”, Politecnico di Milano, (15 ETCS).

2005 - 2008: lecturer of the course “Progetto di I.M.A.D.”, Politecnico di Milano, (7,5 ETCS).

2004 - 2008: lecturer of the course “Progetto di identificazione dei modelli ed analisi dei dati”, Politecnico di Milano, (10 ETCS).

2000 - 2012: teaching assistant for 29 courses at the Politecnico di Milano for a total amount of 502 hours.

2002 – 2008: laboratory assistant for 7 courses at the Politecnico di Milano for a total amount of 40 hours.

Supervisor or co-supervisor of ten Master's Thesis and of nine Bachelor's Thesis.

PUBLICATIONS

A. International Journals

- [A.12] S. Garatti, M.C. Campi "Modulating robustness in control design: principles and algorithms", **IEEE Control Systems Magazine**, **33**(2):36-51, 2013.
- [A.11] S. Garatti, S. Bittanti "A new paradigm for parameter estimation in system modeling", **Journal of Adaptive Control and Signal Processing**, Published on-line, 2012.
- [A.10] M. Campi, S. Garatti, "A sampling-and-discarding approach to chance-constrained optimization: feasibility and optimality", **Journal on Optimization Theory and Applications**, **148**(2):257-280, 2011.
- [A.9] S. Garatti, R.R. Bitmead, "On resampling and uncertainty estimation in linear system identification", **Automatica (regular paper)**, **46**(5): 785-795, 2010.
- [A.8] S. Garatti, M. Campi, S. Bittanti, "Iterative robust control: speeding up improvement through iterations", **Systems & Control Letters**, **59**(2):139-146, 2010.
- [A.7] M. Campi, S. Garatti, M. Prandini, "The scenario approach for systems and control design", **Annual Reviews in Control**, **33**(2):149-157, 2009.
- [A.6] M. Campi, G. Calafiore, S. Garatti, "Interval predictor models: identification and reliability", **Automatica (regular paper)**, **45**(2): 382-392, 2009.
- [A.5] M. Campi, S. Garatti, "The exact feasibility of randomized solution of uncertain convex programs", **SIAM Journal on Optimization**, **19**(3): 1211-1230, 2008.
- [A.4] S. Garatti, S. Bittanti, D. Liberati, A. Maffezzoli, "An unsupervised clustering approach for leukaemia classification based on dna micro-arrays data", **Intelligent Data Analysis**, **11** (2): 175-188, 2007.
- [A.3] S. Garatti, M. Campi, S. Bittanti, "The asymptotic model quality assessment for instrumental variable identification revisited", **System & Control Letters**, **55** (6): 494:500, 2006.
- [A.2] S. Garatti, M. Campi, S. Bittanti, "Assessing the quality of identified models through the asymptotic theory – When is the result reliable?", **Automatica (regular paper)**, **40** (8): 1319-1332, 2004.
- [A.1] S. Garatti, S.M. Savaresi, S. Bittanti, L. La Brocca, "On the relationships between user profiles and navigation sessions in virtual communities: a data-Mining approach", **Intelligent Data Analysis**, **8**(6):579-600, 2004.

B. Chapters of international books

- [B.3] S. Garatti, M. Prandini, "Design in presence of uncertainty: the scenario approach", in: "**Modern Computational Science 12, Optimization**" (eds. R. Leidl, A.K. Hartmann) – BIS-Verlag der Carl von Ossietzky Universität Oldenburg, 2012.
- [B.2] M. Prandini, M. Campi, S. Garatti, "Controller design through random sampling: an example", in: "**Advance in control theory and applications**" (eds. C. Boniventi, A. Isidori, L. Marconi, C. Rossi) – Springer Verlag, LCNIS series, 2007.

- [B.1] D. Liberati, S. Garatti, S. Bittanti, "Unsupervised mining of genes classifying Leukaemia", in: "Encyclopedia of Data Warehousing and Mining" (ed. J. Wang) – Idea Group Publishing, 2005.

C. International conference proceedings

- [C.26] L. Deori, S. Garatti, M. Prandini, "Stochastic constrained control: trading performance for state constraint feasibility", **12th European Control Conference**, Zurich, Switzerland, 2013.
- [C.25] M. Prandini, S. Garatti, J. Lygeros, "A randomized approach to stochastic model predictive control", **Proceedings of the 51st IEEE Conference on Decision and Control**, Maui, Hawaii, USA, 2012.
- [C.24] S. Bittanti, S. Garatti, "System Identification and control: a fruitful cooperation over half a century and more" (**plenary lecture**), **Proceedings of the 31st Chinese Control Conference**, Hefei, China, 2012.
- [C.23] M.C. Campi, B.C. Csàji, S. Garatti, E. Weyer, "Certified system identification - towards distribution-free results" (**plenary lecture**), **Proceedings of the 16th IFAC Symposium on System Identification (SYSID)**, Brussels, Belgium, 2012.
- [C.22] S. Garatti, M. Prandini, "A simulation based approach to the approximation of stochastic hybrid systems", **Proceedings of the 4th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 12)**, Eindhoven, The Netherlands, 2012.
- [C.21] A. Carè, S. Garatti, M. Campi "Randomized min-max optimization: the exact risk of multiple cost levels", **Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference**, Orlando, Florida, USA, 2011.
- [C.20] A. Carè, S. Garatti, M. Campi "FAST: an algorithm for the scenario approach with reduced sample complexity", **Proceedings of the 18th IFAC World Congress**, Milan, Italy, 2011.
- [C.19] S. Bittanti, S. Garatti, M. Sarati "Parameter estimation in induction motors: a comparison between the PE and the TS paradigm", **Proceedings of the 18th IFAC World Congress**, Milan, Italy, 2011.
- [C.18] M.C. Campi, S. Garatti "Variable robustness control: principles and algorithms" (**semiplenary lecture**), **Proceedings of 19th International Symposium on Mathematical Theory of Networks and Systems (MTNS)**, Budapest, Hungary, 2010.
- [C.17] S. Garatti, R.R. Bitmead, "On re-sampling and uncertainty estimation in linear system identification", **Proceedings of the 15th IFAC Symposium on System Identification (SYSID)**, Saint-Malo, France, 2009.
- [C.16] S. Garatti, S. Bittanti, "Parameter estimation in the Pacejka's tyre model through the TS method", **Proceedings of the 15th IFAC Symposium on System Identification (SYSID)**, Saint-Malo, France, 2009.
- [C.15] S. Garatti, M.C. Campi, "L-inf layers and the probability of false prediction", **Proceedings of the 15th IFAC Symposium on System Identification (SYSID)**, Saint-Malo, France, 2009.
- [C.14] S. Bittanti, S. Garatti, "Revisiting the basic issue of parameter estimation in system identification – a new approach for multi-value estimation", **Proceedings of the 47th IEEE Conference on Decision and Control**, Cancun, Mexico, 2008.
- [C.13] S. Garatti, S. Bittanti, "Estimation of white-box model parameters via artificial data generation: a two-stage approach", **Proceedings of the 17th IFAC world congress**, Seoul, Korea, 2008.
- [C.12] M. Campi, S. Garatti, M. Prandini, "The scenario approach for systems and control design", **Proceedings of the 17th IFAC world congress** (stampato inoltre nel volume "Plenary Papers, Milestone Reports & Selected Survey Papers", pp. 180-188), Seoul, Korea, 2008.

- [C.12] S. Garatti, S. Bittanti, "*Parameter estimation via artificial data generation with the 'two-stage' approach*", **Proceedings of the 7th World Congress on Intelligent Control and Automation**, Chongqing, China, 2008.
- [C.10] M. Campi, S. Garatti, "*Modulating robustness in robust control: making it easy through randomization*", **Proceedings of the 46th IEEE Conference on Decision and Control**, New Orleans, Louisiana USA, 2007.
- [C.9] S. Bittanti, S. Garatti, M. Campi, "*Introducing robustness in iterative control*", **Proceedings of the 44th IEEE Conference on Decision and Control**, Seville, Spain, 2005.
- [C.8] M. Campi, G. Calafiore, S. Garatti, "*New results on the identification of interval predictor models*", **Proceedings of the 16th IFAC world congress**, Prague, Czech Republic, 2005.
- [C.7] S. Bittanti, S. Garatti, D. Liberati, "*From DNA microarrays to disease classification: an unsupervised clustering approach*", **Proceedings of the 16th IFAC world congress**, Prague, Czech Republic, 2005.
- [C.6] S. Bittanti, M. Campi, S. Garatti, "*Some critical implementation issues in iterative robust control design*", **Proceedings of the 8th IFAC workshop on Adaptation and Learning in Control and Signal Processing**, Yokohama, Japan 2004.
- [C.5] S. Garatti, S. Bittanti, M. Campi, "*Model quality assessment for Instrumental Variable methods: use of the asymptotic theory in practice*", **Proceedings of the 42nd IEEE Conference on Decision and Control**, Maui, Hawaii USA 2003. pp. 6015-6020.
- [C.4] S. Savaresi, S. Garatti, S. Bittanti, "*Modeling the relationships between the user DB and the web-log file of a large virtual community*", **Proceedings of the 13th IFAC Symposium on System Identification**, Rotterdam, The Netherlands 2003. pp. 219-224.
- [C.3] S. Savaresi, S. Garatti, S. Bittanti, L. La Brocca, "*Data-Mining of a large virtual community: relationships between the users DB and the web-log file*", **Proceedings of the 3rd SIAM International Conference on Data Mining**, San Francisco, California USA 2003. pp. 299-303.
- [C.2] S. Bittanti, M. Campi, S. Garatti, "*New results on the asymptotic theory of system identification for the assessment of the quality of estimated models*", **Proceedings of the 41st IEEE Conference on Decision and Control**, Las Vegas, Nevada USA 2002. pp. 1814-1819.
- [C.1] S. Bittanti, M. Campi, S. Garatti, "*An iterative controller design scheme based on average robust control*", **Proceedings of the 15th IFAC World Congress**, Barcelona, Spain 2002.

D. National Journals

- [D.1] D. Liberati, S. Bittanti, S. Garatti, Z. Zhao, M. Pappaletta, "*Classificazione di leucemie mediante analisi di dati da microarray*", *Automazione e Strumentazione* LIII(10):79-86, 2005.