

*Last update July 26, 2016*

## A. PERSONAL DATA



Born: Florence, July 14th, 1960

Citizenship: Italian

Family name Giarré

Name Laura

### A.1. EDUCATION

- 1992 Ph.D. in Systems Engineer - Univ. of Bologna (associated Univ. of Padova and Univ. Of Florence)
- 1996 Master degree in Electronic Engineer - Univ. of Florence

### A.2. WORKING CAREER

- 2008-Today Associate Professor at University of Palermo - Electric, Electronic, Communication, Control, and Mathematical Engineering Dept.
- 1993-1998 Assistant Professor at Politecnico di Torino, Computer and Control Engineering Dept.
- 1992-1993 Technical Staff, Univ. Of Florence
- 1989-1992 Ph. D. Fellow at Univ. of Florence, Computer and Systems Dept.
- 1988 Fellowship on robotics, Univ. of Florence and AXIS
- 1987-1988 Researcher at Autostrade Spa.

### A.3. MAIN RESEARCH TOPICS

Laura Giarré has developed a comprehensive methodology for the robust identification and modeling of systems under unknown but bounded disturbances and model uncertainty. Her innovative work in the  $H_\infty$  approach to identification for robust control and model selection is well known and it is widely recognized. Such results are powerful because of the generality and simplicity of the derived methodology. Model selection is based on the quality of the model, measured in terms of prediction capability, and on the size of the uncertainty set ([Giarre1997-1],[Giarre1997], [Giarre1997-2]). She has applied the set membership identification framework and the analysis and modeling of uncertainty to various innovative application fields, e.g. the Atomic Force Microscope ([Basso2000]).

Laura Giarré expanded the identification theory also to time-varying systems and nonlinear systems. She has solved the problem of Linear Parameter Varying (LPV) identification. This contribution is one of the first available in the literature. It has been employed by researchers in aeronautic, power systems, jet-turbine and also communication applications ([Bamieh2002],[Bauso2006]). She extended classical and robust identification also to a particular class of nonlinear systems such as Hammerstein and Wiener, i.e. cascade systems of static nonlinearities and linear parts applied also to Systems Biology ([Garulli2002],[Basso2005], [Falugi2005],[Falugi2009]).

A second fundamental contribute of Laura Giarré is in the area of networks and consensus protocols, where she developed distributed linear and nonlinear algorithms for switching networks with noise ([Bauso2006-1]). Showing her broad and interdisciplinary interests she has applied these results to inventory systems, congestion games and sensor networks ([Bauso2008],[Bauso2009], [Bauso2010]). Her innovative contribution stands in the reformulation of the problem according to a game theoretic approach and in solving the consensus problem in presence of UBB noise ([Bauso2009-1]) and also in modeling the dissensus paradigm ([Bauso2011]). In the area of networks, she applied the game theoretical approach also to communication problem and WiFi networks ([Tinnirello2011], [giarre2009]) and in smart grid ([neglia16]).

The most cited papers are: [Bamieh2002] with 350 citations and [Bauso2006-1] with 201 citations. Citations number: total number - 1678, *h* index - 19. (Font: Google Scholar)

## — B. INDIVIDUAL SCIENTIFIC ACTIVITIES

### — B.1. AWARDS AND RECOGNITIONS

Professional society fellowship	Senior Member IEEE (from 1999)
Professional society fellowship	Member of the IEEE CSS Technical committee on System Biology (from 2007)
Professional society fellowship	Member of the IEEE CSS Technical committee on Identification and Adaptive Control, (from 2006)
Professional society fellowship	Member of the IEEE CSS Technical committee on Smart Grid (dal 2011)
Professional society fellowship	Member of the IEEE CSS Technical committee on Healthcare and Medical Systems, (dal 2014)

### — B.2. RESEARCH PERIODS ABROAD

From (mm/yyyy)	To (mm/yyyy)	Institution/University	Role
08/1996	9/1996	UCSB, Santa Barbara, CA, US	Visiting Professor
01/1999	07/1999	UCSB, Santa Barbara, CA, US	Visiting Professor
11/1999	12/1999	UCSB, Santa Barbara, CA, US	Visiting Professor
02/2006	06/2006	UCSB, Santa Barbara, CA, US	Visiting Professor
02/1997	02/1997	UCSB, Santa Barbara, CA, US	Invited Researcher
7/2000	7/2000	UCSB, Santa Barbara, CA, US	Invited Researcher
10/2001	10/2001	UCSB, Santa Barbara, CA, US	Invited Researcher
12/2003	12/2003	UCSB, Santa Barbara, CA, US	Invited Researcher
2/2002	2/2002	UCSB, Santa Barbara, CA, US	Invited Researcher
06/2011	06/2011	UCSB, Santa Barbara, CA, US	Invited researcher
12/2014	12/2014	UCSB, Santa Barbara, CA, US	Invited researcher
2/2016	2/2016	UCSB, Santa Barbara, CA, US	Invited researcher
11/2002	11/2002	MIT, Cambridge, MA, US	Invited Researcher
10/2003	10/2003	MIT, Cambridge, MA, US	Invited Researcher
10/2005	10/2005	MIT, Cambridge, MA, US	Invited Researcher
11/2007	11/2007	MIT, Cambridge, MA, US	Invited Researcher
11/2009	11/2009	MIT, Cambridge, MA, US	Invited Researcher

12/2010	12/2010	MIT, Cambridge, MA, US	Invited Researcher
12/2011	12/2011	MIT, Cambridge, MA, US	Invited Researcher
2/2015	5/2015	MIT, Cambridge, MA, US	Invited Researcher
9/2015	10/2015	MIT, Cambridge, MA, US	Invited Researcher
11/2003	11/2003	NTNU, Trondheim, NO	Invited Researcher
1/2007	1/2007	NTNU, Trondheim, NO	Invited Researcher
9/2008	9/2008	NTNU, Trondheim, NO	Invited Researcher
9/2009	9/2009	NTNU, Trondheim, NO	Invited Researcher
10/2012	10/2012	NTNU, Trondheim, NO	Invited Researcher
04/2009	04/2009	Inria, Paris, F	Invited Researcher
11/2010	11/2010	Imperial College, London, UK	Invited Researcher

## C. COMMON INTEREST SCIENTIFIC ACTIVITIES

### C.1. RESEARCH PROJECTS IN CHARGE

*FP7, PRIN, etc. – N.B.: no industrial contracts (see C.5.). Specify only the projects where you have been Project coordinator, Research Unit coordinator or research unit member- Last 10 academic years*

<b>Nome del Progetto (Sponsor)</b>	<b>Tipo L: Locale N: Nazionale E: Europeo O: Altro</b>	<b>Periodo (aaaa/aaaa)</b>	<b>Progetto coordinatore</b>	<b>Unitá coordinatore</b>
FIC6-Fiware (European Commission)	E	2016		X
ESTIA-EARTH (European Commission)	E	2008/2011		X
ESTIA-NET (European Commission)	E	2005/2007		X
CORI (Univ. Palermo- MIT)	L	2003/2005	X	
CORI (Univ. Palermo- UCSB)	L	2000/2002	X	
KKK (Norwegian Research Council)	O	2007/2009		X
KKK (Cultural Council of Norway)	O	2007/2009		X
KKK (Norwegian Research Council)	O	2007/2009		X
FLAVIA (European Commission)	E	2010/2012		
POR TTB (Regional European funds)	N	2012/2014		
PON 04 I-NEXT (MIUR)	N	2012-2014		
PON 04 Smart FSE (MIUR)	N	2012-2014		

PON 03 NEPTIS (MIUR)	N	2014-2016
PRIN2006 (MIUR)	N	2006-2008
PRIN2004 (MIUR)	N	2004-2002
PRIN2002 (MIUR)	N	2002-2004

## C.2. MEMBERSHIP IN BOARDS/COMMITTEES/RESEARCH CENTERS ETC.

<b>Tipo</b>	<b>Nome</b>	<b>Ruolo</b>	<b>Periodo (aaaa/aaaa)</b>
Board	Systems and Control Letters	Editorial Board	1999-2012
Board	IEEE Transaction on Automatic Control	Editorial Board	2012-2015
Board	Andrea Bocelli Foundation	Advisory Board	2011-Today
Committee	ABF Challenges workshop, Expo, Milan	General Chair and Organizer	2015
Committee	Mediterranean Conference on Control and Automation, Palermo	General Chair and Organizer	2014
Committe	ABF Challenges workshop, MIT, Cambridge	General Chair and Organizer	2013
Committee	IEEE Conference on Decision and Control, Florence	Registration Co-chair	2013

<b>Date (mm/yyyy)</b>	<b>Type</b>	<b>Institution/University/Conference</b>
02/2016	Lecture	UCSB, Santa Barbara, US
04/2015	Lecture	MIT, Cambridge, US
10/2014	Lecture	MIT, Cambridge, US
06/2012	Lecture	MIT, Cambridge, US
06/2012	Lecture	MIT- ETIS
4/2012	Seminar	Univ. Padova
12/2011	Seminar	MIT
06/2011	Lecture	Santa Barbara Workshop, UCSB
11/2010	Seminar	Imperial College
4/2009	Seminar	INRIA, Paris
4/2009	Seminar	INRIA, Paris
1/2009	Seminar	Politecnico Torino
1/2007	Seminar	NTNU
12/2006	Seminar	UCSB
10/2006	Seminar	MIT
9/2006	Seminar	Iowa State University
3/2006	Seminar	University of California at Berkeley
2/2006	Seminar	UCSB
4/2004	Lecture	Workshop Actra, Mondragone

5/2003	Seminar	Univ. Napoli
4/2003	Seminar	Politecnico di Torino
10/2002	Seminar	MIT
7/2002	Lecture	Robust Control Worksgop, Cascais
11/1999	Seminar	Politecnico di Torino
9/1996	Seminar	UCSB

#### C.4. OR COMMUNITY ACTIVITIES

Organizer of the new curriculum on Cybernetics Engineering 2015

<b>Tipo</b>	<b>Periodo (aaaa/aaaa)</b>
CIRA Conference- organization of PH.D. Poster Session	2003–2005

#### C.5. TECHNOLOGY TRANSFER

*Industrial contracts (only if Project Leader), consultancy services, workshop/seminar for companies, etc.  
- Last 5 academic years*

<b>Tipo</b>	<b>Periodo (aaaa/aaaa)</b>
<ul style="list-style-type: none"> <li>o She is the co-founder and director of the Innovative Startup In.sight for the development of innovative technology solutions to help people overcome the limits imposed by their disability since 2015. The startup consists of 6 members and in 2016 had 5 employees including software developers and communications manager. He managed the European project FIC3 and realized three pilot installations of the Arianna system. The app Arianna is now available on both Google Play and on Apple store. The site is <a href="http://in.sight.srl">http://in.sight.srl</a>, The stratup won the Startcup Sicilia 2014, the UK Trade and Investments 2015 prize award and the Scintille award in 2016 and participated to many events, exhibitions and awards. It Also received the seal of excellence for participating in a European SME call.</li> <li>o Collaboration with eHealthtech, Florence (eHealthTech is a start-up in the Healthcare IT area. The project "Health Level Seven Version 3 Interoperability" (HL7v3i) was realized under the EU grant FSE POR Regione Toscana 2000-2006 Mis. D3 - Provincia di Firenze D.D. n. 2836 dated 12/18/2007). The project HL7v3Enabler was financed by Regione Toscana "Docup Ob2 2000-2006 - Misura 1.8 Azione 1.8.1 - Aiuti alla ricerca industriale e precompetitiva". Active collaboration since 2006.</li> <li>o Collaboration with TELECOM (sponsor of 4 Ph.D grants) on e-Health problems (detection of Parkinson diseases through signal processing and identification of speech data) since 2012.</li> <li>o Collaboration with ItaltBS, Trieste (a leading group in e-health and clinical engineering). Active Collaboration since 2012.</li> <li>o Collaboration with Concast, Udine on localization and sensor networks. Friuli Venezia Giulia Region D.P.R 0260-2007 Grant: 'Magazzino intelligente a logica integrata per lo stoccaggio di materiali siderurgici' Active collaboration since 2012.</li> <li>o Collaboration with Italtel and participation to the FAR project NAIN (Nomadic Access in IP Networks) - 2006-2008</li> </ul>	

#### C.6. PATENTS

<b>Nome del Progetto</b>	<b>Periodo (aaaa/aaaa)</b>
US Patent "Situational Awareness for Visually Impaired People Using Depth-Based Spatial Navigation	

and Object Identification”, filed 10-16-2015 and given serial number 62/242,372, pending

**Nome del Progetto**

**Periodo**

**(aaaa/aaaa)**

Italian Patent ” Sistema di Navigazione per non vedenti”, January 2015, application number BG2014A000054, pending

## D. TEACHING ACTIVITIES

### D.1. TEACHING IN CHARGE

*Number of credits (CFU) per academic year, level, scientific sector (S.S.D.), and language - Last 10 academic years*

Academic Year (yyyy/yyyy)	Bachelor		Master		Ph.D.		Specializing Master		S.S.D.	Total
	Italian	English	Italian	English	Italian	English	Italian	English		
2015/2016	9								ING-INF/04	18
2013/2014	9		9						ING-INF/04	18
2012/2013	9		9		3				ING-INF/04	21
2011/2012	9		12						ING-INF/04	21
2010/2012			9		3				ING-INF/04	12
2009/2010	9		9						ING-INF/04	18
2008/2009	9		9						ING-INF/04	18
2007/2008	9		9						ING-INF/04	18
2006/2007	9		9						ING-INF/04	18
2005/2006										
2004/2005	12		9						ING-INF/04	21
2003/2005	12								ING-INF/04	12
<b>Total</b>	<b>78</b>		<b>75</b>		<b>6</b>					<b>159</b>

### D.1. PH.D. SUPERVISION

*Specify only the number of Ph.D. Laureates that you have supervised (last 10 years)*

Academic Year	Ph.D. Laureates
2004/2005	1
2012/2013	1
2013/2014	1
<b>Total</b>	<b>3</b>

## E. OTHER USEFUL INFORMATION

She is also very active in dissemination of technology for educational purpose; in sustaining women in engineering and academia, in art and technology as an educational tool, and, recently, she is getting interested in assistive technology for impaired people. Laura Giarré is also active in projects related to e-health and assistive technologies.

Laura Giarré and also is very active in projects related to e-health ([calamai2012]) also following scholarships as part of the Smart Health PON and Erasmus Thesis projects using HL7 FHIR standard for the interoperable management of the PHR (Personal Health Record).

As member of the Advisory board of the ABF she Organizes some of its scientific event and she supervises and checks the progress of the project MIT Fifth Sense Project - Providing the function of Sight to blind persons, which has been granted by the Foundation, to find innovative solutions to help people to overcome the limits imposed by their disabilities.

Laura has the hobby of writing. He wrote and published six novels and three books of poems.

## E.2 INDIVIDUAL PROFILE

Laura Giarré works in the Control Systems field since 1989, and she is an associate professor since 1998. In 2014 he qualified for full professor. On its way, characterized by a strong internationalization, she has developed a wide network of international collaborations, mostly multidisciplinary, spending a lot of time abroad, organizing international conferences, workshops, giving seminars and invited graduate schools in order to broaden her teaching and research horizons. Her research interests have always tried to have also a technological/application aspect, as well a territorial impact in terms of technology transfer. Her emphasis on teaching and scientific dissemination led her to also try to use innovative tools, such as blogs, since 2005.

## F. PUBLICATIONS

### INTERNATIONAL JOURNAL

- [J31] I. Tinnirello, G. Neglia, L. Giarré, G. Di Bella, A. Jean-Marie, and M. Ippolito. Large Scale Control of Deferrable Domestic Loads in Smart Grids *IEEE Trans on Smart Grid*, 2016.
- [J30] D. Materassi, M. Salapaka, G. Innocenti, L. Giarré. Model Identification of a Network as Compressing Sensing, *Systems and Control Letters*, 2013.
- [J29] D. Bauso, F. Blanchini, L. Giarré, R. Pesenti, Decentralized solution for the constrained minimum norm flow, *Automatica*, 2013
- [J28] R. Calamai, L. Giarré, Enabling Primary and Specialist Care Interoperability through HL7v3 CDA Rel.2 and Chronic Care Model: an Italian case study, submitted to *IEEE Trans on System Man and Cybernetics*, part A, vol 42, n.6, 1364–1384, ISSN: 1083-4427, doi: 10.1109/TSMCA.2012.2210205, 2012
- [J27] D. Bauso, L. Giarré, R. Pesenti, Quantized Dissensus in Switching Networks with death and duplication of nodes, *IEEE Transaction on Automatic Control*, vol. 57, p. 783-788, ISSN: 0018-9286, doi: 10.1109/TAC.2011.2167810, 2012
- [J26] I. Tinnirello, L. Giarré, G. Neglia. MAC design for WiFi infrastructure networks: a game theoretic approach. *IEEE Transaction on Wireless Communication*, vol. 10, p. 2510-2522, ISSN: 1536-1276, doi: 10.1109/TWC.2011.062011.100193, 2011.
- [J25] D. Bauso, L. Giarré, R. Pesenti, paperi/IJC.pdf Robust control of uncertain multi-inventory systems via Linear Matrix Inequality, *International Journal of Control*, August, 83(8), 1723-1740, ISSN: 0020-7179, doi: 10.1080/00207179.2010.491131, 2010
- [J24] L. Giarré, G. Neglia, I. Tinnirello. paperi/TGN.pdf Medium Access in WiFi Networks: Strategies of Selfish Nodes. *IEEE Signal Processing Magazine (SPM)*, 26(5), 124-127, ISSN: 1053-5888, 2009.
- [J23] P. Falugi, L. Giarré, paperi/sclfa.pdf Set Membership Identification of nonlinear positive models for biological systems. *Systems and Control Letters*, 58(7), 529-539, ISSN: 0167-6911, doi: <http://dx.doi.org/10.1016/j.sysconle.2009.03.005> 2009.
- [J22] D. Bauso, L. Giarré, R. Pesenti, paperi/articolosiam.pdf Consensus for networks with unknown but bounded disturbances. *SIAM JOURNAL ON CONTROL AND OPTIMIZATION*, 48(3); 1756-1770, ISSN: 0363-0129, doi: 10.1137/060678786, 2009
- [J21] D. Bauso, L. Giarré, R. Pesenti. paperi/Ejor.pdf Distributed Consensus in Noncooperative Inventory Games. *EUROPEAN JOURNAL OF OPERATIONAL RESEARCH*; 192(3), 866-878, doi:10.1016/j.ejor.2007.10.012, 2009.
- [J20] D. Bauso, L. Giarré, R. Pesenti. paperi/tac.pdf Consensus in Noncooperative Dynamic Games: a Multi-Retailer Inventory Application. *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*, 53(4), 998-1003, ISSN: 0018-9286, doi: 10.1109/TAC.2008.919546, 2008.
- [J19] D. Bauso, L. Giarré, R. Pesenti. paperi/scl.pdf Nonlinear protocols for optimal distributed consensus in networks of dynamic agents. *Systems and Control Letters*, 915-928, 55(11), ISSN: 0167-6911, doi: 10.1016/j.sysconle.2006.06.005, 2006.



- [J18] L. Giarré, D. Bauso, P. Falugi and B. Bamieh. paperi/falugi.pdf LPV Model Identification for Gain Scheduling Control: an application to stall and surge control. *Control Engineering Practice*, 14 (4): 351-361, 2006.
- [J17] P. Falugi, L. Giarré and G. Zappa, paperi/zappa.pdf Approximation of the Feasible Parameter Set in worst-case identification of Hammerstein models. *Automatica*, 41(6), 1017-1024, 2005.
- [J16] M. Basso, L. Giarré, S. Groppi, G. Zappa. paperi/cstrev.pdf NARX Models of an Industrial Power Plant Gas Turbine *IEEE Trans on Control Technology*, 13(4), 599-605, 2005.
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- [J13] M. Basso, L. Giarré, M. Dahleh and I. Mezić. paperi/JDS00240.pdf Complex Dynamics in a Harmonically Excited Lennard-Jones Oscillator: Microcantilever-Sample Interaction in Scanning Probe Microscopes. *ASME Journal of Dynamic Systems, Measurement and Control*, 122(1), 240-245, 2000.
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- [J10] L. Giarré and M. Milanese. paperi/97b.pdf Model quality evaluation in  $H_2$  identification. *IEEE Transaction on Automatic Control*. 42(5), 691-698, 1997.
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- [J7] L. Giarré and M. Milanese.  $H_\infty$  identification and model structure selection. *International Journal of Robust and Nonlinear Control*, 6(4), 367-377, 1996.
- [J6] L. Chisci, L. Giarré, and E. Mosca. paperi/chiscigiarremosca94.pdf Indirect and implicit adaptive predictive control of a benchmark plant. *Automatica*, 30(4), 577-584, 1994.
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- [J4] L. Giarré and E. Mosca. paperi/93.pdf Implicit predictive adaptive controller with stochastic gradient identifiers. *IEEE Transaction on Automatic Control*, 38(7), 1135-1139, 1993.
- [J3] E. Mosca and L. Giarré. paperi/moscagiarre.pdf A polynomial approach to MIMO LQ servo and disturbance rejection problems. *Automatica*, 28(1), 209-213, 1992.
- [J2] E. Mosca, L. Giarré, and A. Casavola. paperi/90.pdf On the polynomial equations for the MIMO stochastic regulator. *IEEE Transactions on Automatic Control*, 35(3), 320-322, 1990.
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## BOOKS

- [E1] L. Giarré and B. Bamieh. paperi/LNCIS289.pdf *Multidisciplinary Research in Control: the Mohammed Dahleh Symposium*, LNCIS N. 239, Springer-Verlag, 2003.

## BOOK CHAPTERS

- [B1] L. Giarré, P. Falugi, R. Badalamenti, Hybrid LPV Modeling and Identification, in *LINEAR PARAMETER-VARYING SYSTEM IDENTIFICATION New Developments and Trends*, P. dos Santos, T. Perdicolis, C. Novara, J. Ramos and D. Rivera, World Scientific, 2011.
- [B2] D. Bauso, L. Giarré and R. Pesenti. Dealing with uncertainty in consensus protocols, *Modeling, Estimation and Control of Networked Complex Systems*, CHIUSO, A., FORTUNA, L., FRASCA, M.,



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- [B3] D.Bauso, R. Pesenti, L. Giarré. Cooperative Inventory Control, *Current Trends in Nonlinear Systems and Control*, BirkHauser, Edited by L. Menini, L. Zaccarian and C.T.Abdallah, Boston, 2005.
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- [B5] P. Falugi, L. Giarré, L. Chisci, G. Zappa. LPV predictive control of the stall and surge for jet engine, *Periodic Control Systems-2001*, Elsevier, 2001. Edited by S. Bittanti.
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- [C2] E. Mosca and L. Giarré. Minimax LQ-stochastic tracking and disturbance rejection problems. In *Proc. 28<sup>th</sup> IEEE Conf. Decision and Control*, pagg. 1473-1477, Tampa (USA), 1989.
- [C3] L. Giarré and E. Mosca. Direct predictive adaptive control with stochastic gradient identifiers. In *Proc. 30<sup>th</sup> IEEE Conf. Decision and Control*, pagg. 1788-1789, Brighton (UK), 1991.
- [C4] E. Mosca, L. Chisci, and L. Giarré. Direct predictive adaptive control of a benchmark example: MUSMAR. In *Proc. of 1<sup>st</sup> European Control Conference*, pagg. 2368-2373, Grenoble (F), 1991.
- [C5] E. Mosca, L. Chisci, and L. Giarré. Sidestepping the certainty equivalence in 2DOF adaptive control via multiple implicit identifiers. In *IFAC Workshop on Mutual Impact of Computing Power and Control Theory*, Praga, pagg. 93-98, 1992.
- [C6] L. Chisci, L. Giarré, and E. Mosca. Improving RELS local convergence via long-range predictive identifiers. In *Proc. 31<sup>st</sup> IEEE Conf. Decision and Control*, pagg. 527-529, Tucson (USA), 1992.
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- [C8] L. Giarré. Adaptive-Q tuning to enhance performance of a nominally controlled plant. In *Proc. of 2<sup>nd</sup> European Control Conference*, pagg. 2216-2221, Groningen (NL), 1993.
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