

## Prof. ALFREDO GERMANI

### CURRICULUM VITAE

Alfredo Germani received the Doctor Laurea degree *summa cum laude* in Physics in 1972 and the Postdoctoral Degree in Systems and Control Theory in 1974, both from the University "La Sapienza" of Rome. From 1974 to 1975 he held a Post Doc Position at the CSSCCA -CNR within the Institute of Automatica of the Rome University. From December 1975 to June 1986, he worked as a Researcher at the "Istituto di Analisi dei Sistemi e Informatica" (IASI-CNR). In 1978 and 1979, he was at the Department of System Science at the University of California at Los Angeles, (UCLA), as a Visiting Scholar. From 1986 to 1987 he was Professor of Automatic Control at the University of Calabria. From 1987 he is Full Professor of System Theory at the University of L'Aquila, Italy. His educational activity is devoted to the courses of: System Theory; Systems Identification and Data Analysis; Nonlinear, Stochastic and Optimal Control Theory, Modeling and Control of Environmental Systems. He has published more than two hundred ten research papers in books, international journals and refereed conference proceedings in the fields of nonlinear systems, distributed systems, delay systems, finitely additive white noise theory, approximation theory, optimal polynomial filtering for nongaussian systems, image processing and restoring, mathematical modeling for biological processes, Positive Systems. He has been Chairman of the IFIP Working Conference on Stochastic Modeling and Filtering, held in Rome in 1984. Since 1986 he has been Research Associate of System and Control Theory at the IASI-CNR, in Rome. In '89-'92 he has been Chairperson of the School of Electronic Engineering of University of L'Aquila. In '95-'98 he has been responsible of the Control Section of the TEMPUS TACIS Program for cooperation between the University of L'Aquila and University of Almaty, Kazakhstan. Since 1995 to 2000 he has been Head of the Department of Electrical Engineering of University of L'Aquila, and from 1996 up to 2007 he has been Coordinator of PhD School in Electronics at the same University. In July 2006 he was the Chairperson of the ICP of the VI IFAC Workshop on "Time-Delay Systems", held in L'Aquila. Since 2007 he is in the Executive Committees of the Excellence Center "DEWS" and of the Engineering College of the University of L'Aquila. Since 2011 to June 2017 he was in the Committee for evaluation of Spin Off proposals of the University of L'Aquila. In 2012-2014 he was the President of the National Committee for the Scientific evaluation of Professors candidates.

### PROFESSIONAL EXPERIENCE.

- 1/11/1987-present, Full Professor, Automatic Control and Robotics (ING-INF/04), Università dell'Aquila.
- 1/1/1987- present, Research Associate at "Istituto di Analisi dei Sistemi e Informatica" (IASI-CNR) of Rome.
- 18/6/1986-30/10/1987, Full Professor, Automatic Control, Università della Calabria.
- 15/12/1975-17/6/1986, Researcher, IASI-CNR, Rome.
- 18/2/1978- 10/5/1979, Visiting Scholar at Dept. of System Sciences at the University of California at Los Angeles, (UCLA), U.S.A.
- 10/12/1973-10/12/1975, CNR Research Fellow, Istituto di Automatica , Università di Roma, La Sapienza.

### ACADEMIC ACTIVITY:

- 2007-2008, President of the Executive Committee for the second-level Engineering Master: Metodi di Ottimizzazione e Data Mining.
- 2007-2010, Member of the Executive Committee of the Engineering Faculty of the University of L'Aquila.
- 2001-2003, Member of the Committee of the Research Center of Excellence, "DEWS", of the University of L'Aquila.

- 1996-2007, President of the PhD School in Electrical and Information Engineering of the DIEL, L'Aquila.
- 2001, President of the Committee for the Institution of the new Laurea Degree in "Ingegneria Informatica e Automatica" at the University of L'Aquila.
- 1995-2000, Head of the Electrical Engineering Department.
- 1991-1994, Chairman of the School of Electronic Engineering.
- 1995-1998, In Charge of the Management for the Control Section of the TEMPUS-TACIS Program for cooperation with the Technical University of Almaty, Kazakhstan.

## **RESEARCH AREAS:**

- FILTERING THEORY
- STOCHASTIC CONTROL
- NONLINEAR CONTROL SYSTEMS
- DELAY SYSTEMS
- APPROXIMATION THEORY
- IMAGE PROCESSING
- MODELLING OF BIOLOGICAL PROCESSES
- POSITIVE SYSTEMS

## **JOURNAL PAPERS**

- 89 Cacace F, Conte F, Germani A.(2017) Output Transformation and Separation Results for Feedback Linearisable Delay Systems.(2017) International Journal of Control, pp.1-16. Article in Press. Doi:10.1080/00207179.2017.1293848
- 88 Cacace,F.,Conte,F.,Germani,A. Palombo,G. (2017)Feedback Quadratic Filtering. Automatica, 82,pp. 158-164. doi: 10.1016/j.automatica.2017.04.046
- 87 Cacace,F.,Conte,F.,Germani,A. Palombo,G. (2017). Joint State Estimation and Delay Identificationfor Nonlinear Systems with Delayed Measurements. IEEE Transaction on Automatic Control, 62(9). art. no. 7890394, pp. 4848-4854.doi: 10.1109/TAC.2017.2689503
- 86 Cacace F.,Germani A. (2017). Output Feedback Control of Linear Systems with Input, State and Output Delays by Chain of Predictors. Automatica 85, pp. 455-461. doi:10.1016/j.automatica.2017.08.013
- 85 Borri Alessandro, Cacace Filippo, De Gaetano Andrea, Germani Alfredo, Manes Costanzo, Palumbo Pasquale, Panunzi Simona, Pepe Pierdomenico (2017). Luenberger-like Observers for Nonlinear Time-Delay Systems with Application to the Artificial Pancreas. IEEE CONTROL SYSTEMS, vol. 37, ISSN: 1066-033X
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- 83 Cacace,F.,Conte,F.,Germani, A.,(2016) Memoryless Approach to the LQ and LQG Problems with Variable Input Delay. (2016) IEEE Transaction on Automatic Control, 61(1), art. no 7097680, pp.216-221.doi: 10.1109/TAC.2015.2427611
- 82 Cacace,F.,Conte,F.,Germani,A. Palombo, G.(2016), Optimal Control of Linear Systems with large and variable Input Delays. Systems and Control Letters, 89,pp.1-7. Doi: 10.1016/j.sysconle.2015.12.003

- 81 Cacace,F.,Conte,F.,Germani,A. Palombo, G.(2016), Delay Identification for a Cllass of Nonlinear Systems. International Journal of Control, 89(11). pp.2350-2359. Doi:10.1080/00207179.2016.1157898
- 80 Cacace,F.,Cusimano,V., Germani, A., Palumbo, P.(2016) A State Predictor for Continuous-time StochasticSystems. Systems and Control Letters, 98, pp.37-43. Doi: 10.1016/j.sysconle.2016.10.004
- 79 Cacace F, Germani A, Manes C (2015). A new approach to design interval observers for linear systems. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, vol. VOL. 60, p. 1665-1670, ISSN: 0018-9286, doi: 10.1109/TAC.2014.2359714
- 78 Cacace F, Conte F, Germani A (2015). Filtering Continuous-Time Linear Systems with Time-Varying Measurement Delay . IEEE TRANSACTIONS ON AUTOMATIC CONTROL, vol. VOL. 60, p. 1368-1373, ISSN: 0018-9286, doi: 10.1109/TAC.2014.2357138
- 77 Cacace F, Germani A, Manes C (2014). A Chain Observer for Nonlinear Systems with Multiple Time-Varying Measurement Delays. SIAM JOURNAL ON CONTROL AND OPTIMIZATION, vol. 52, p. 1862-1885, ISSN: 0363-0129, doi: 10.1137/120876472
- 76 Cacace F, Germani A, Manes C (2014). Exponential stabilization of linear systems with time-varying delayed state feedback via partial spectrum assignment. SYSTEMS & CONTROL LETTERS, vol. 69, p. 47-52, ISSN: 0167-6911, doi: 10.1016/j.sysconle.2014.04.007
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- 74 Conte F, Germani A, Iannello G (2013). A Kalman Filter Approach for Denoising and Deblurring 3-D Microscopy Images. IEEE TRANSACTIONS ON IMAGE PROCESSING, vol. 22, p. 5306-5321, ISSN: 1057-7149, doi: 10.1109/TIP.2013.2284873
- 73 Fasano A., Germani A., Monteriù, A., (2013). REDUCED-ORDER QUADRATIC KALMAN-LIKE FILTERING OF NON-GAUSSIAN SYSTEMS. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, vol. 58, p. 1744-1757, ISSN: 0018-9286, doi: 10.1109/TAC.2013.2246474
- 72 Conte F, Cusimano V, Germani A (2013). Robust planar tracking via a virtual measurement approach. EUROPEAN JOURNAL OF CONTROL, vol. 19, p. 146-156, ISSN: 0947-3580, doi: <http://dx.doi.org/10.1016/j.ejcon.2012.04.001>
- 71 Cacace F, Germani A, Palumbo P (2013). The observer follower filter: A new approach to nonlinear suboptimal filtering. AUTOMATICA, vol. 49, p. 548-553, ISSN: 0005-1098, doi: 10.1016/j.automatica.2012.11.023
- 70 Cacace F, Germani A, Manes C, Setola R (2012). A New Approach to the Internally Positive Representation of Linear MIMO Systems. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, vol. 57, p. 119-134, ISSN: 0018-9286, doi: 10.1109/TAC.2011.2158170
- 69 Cacace F, Paci P, Cusimano V, Germani A, Farina L (2012). Stochastic Modeling of Expression Kinetics Identifies Messenger Half-Lives and Reveals Sequential Waves of Co-ordinated Transcription and Decay. PLOS COMPUTATIONAL BIOLOGY, ISSN: 1553-7358, doi: 10.1371/journal.pcbi.1002772
- 68 Cacace F, Germani A, Palumbo P (2012). The state observer as a tool for the estimation of gene expression. JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS, vol. 391, p. 382-396, ISSN: 0022-247X, doi: 10.1016/j.jmaa.2012.02.026
- 67 Germani A, Manes C (2012). Two families of semiglobal state observers for analytic discrete-time systems. AUTOMATICA, vol. 48, p. 1707-1714, ISSN: 0005-1098, doi: 10.1016/j.automatica.2012.05.030
- 66 Cacace F, Cusimano V, Di Paola L, Germani A (2011). Observer-based techniques for the identification and analysis of avascular tumor growth. MATHEMATICAL BIOSCIENCES,

- vol. 234, p. 147-153, ISSN: 0025-5564, doi: 10.1016/j.mbs.2011.10.002
- 65 F. Cacace, Germani A, C.Manes (2010). An observer for a class of nonlinear systems with time varying observation delay. SYSTEMS & CONTROL LETTERS, vol. 59, p. 305-312, ISSN: 0167-6911, doi: 10.1016/j.sysconle.2010.03.005
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- 59 M. P. Di Ciccio, A. Germani, Pepe P (2008). A Filter for Nonlinear Systems by means of Deterministic Nonlinear Observers. INTERNATIONAL JOURNAL OF PURE AND APPLIED MATHEMATICS, vol. 49, p. 317-322, ISSN: 1311-8080
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- 53 Germani A, Manes C, Palumbo P (2005). Polynomial Extended Kalman Filter. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, vol. 50, p. 2059-2064, ISSN: 0018-9286, doi: 10.1109/TAC.2005.860256
- 52 Germani A, Manes C, Palumbo P (2004). Polynomial filtering for stochastic nongaussian descriptor systems. IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS. I, REGULAR PAPERS, vol. 51, p. 1561-1576, ISSN: 1549-8328, doi: 10.1109/TCSI.2004.831436
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- 43 Germani A., Manes C, Pepe P. (2000). A Twofold Spline Approximation for Finite Horizon LQG Control of Hereditary Systems. SIAM JOURNAL ON CONTROL AND OPTIMIZATION, vol. 39, p. 1233-1295, ISSN: 0363-0129, doi: 10.1137/S0363012998337461
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- 40 Germani A, Manes C, Pepe P (2000). Local Asymptotic Stability for Nonlinear State Feedback Delay Systems. KYBERNETIKA, vol. 36, p. 31-42, ISSN: 0023-5954
- 39 Germani A, Mavelli G (1999). Optimal quadratic solution for the non-Gaussian finite-horizon regulator problem. SYSTEMS & CONTROL LETTERS, vol. 38, p. 321-331, ISSN: 0167-6911, doi: 10.1016/S0167-6911(99)00069-9
- 38 Germani A, Manes C (1999). State observers for nonlinear systems with smooth/bounded input. KYBERNETIKA, vol. 35, p. 393-413, ISSN: 0023-5954
- 37 Dalla Mora M., Germani A., Manes C (1997). A state observer for nonlinear dynamical systems. NONLINEAR ANALYSIS, vol. 30, p. 4485-4496, ISSN: 0362-546X, doi: [http://dx.doi.org/10.1016/S0362-546X\(97\)00184-3](http://dx.doi.org/10.1016/S0362-546X(97)00184-3)
- 36 Caravetta F, Germani A, Raimondi M (1997). Polynomial filtering of discrete-time stochastic linear systems with multiplicative state noise. IEEE TRANSACTIONS ON AUTOMATIC CONTROL, vol. 42, p. 1106-1126, ISSN: 0018-9286, doi: 10.1109/9.618240
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- 33 Ciccarella G, Dalla Mora M, Germani A (1995). ASYMPTOTIC LINEARIZATION AND STABILIZATION FOR A CLASS OF NONLINEAR-SYSTEMS. JOURNAL OF OPTIMIZATION THEORY AND APPLICATIONS, vol. 84, p. 495-507, ISSN: 0022-3239, doi: 10.1007/BF02191982
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