

## M2 : Nonlinear Output Regulation

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Summary:

1. Limit sets and steady state behavior of nonlinear systems
2. Stability of attractors. Input to state stability
3. Normal forms and zero dynamics
4. Robust stabilization via state feedback
5. Uniform observability and nonlinear observers
6. Robust stabilization via measured feedback
7. The generalized servomechanism problem
8. Robust and adaptive output regulation of linear systems
9. The nonlinear internal model principle
10. Nonlinear observers as internal models
11. Robust output regulation of nonlinear systems
12. Examples
13. Open problems



Alberto Isidori, born in Rapallo (Italy) in 1942, obtained his Laurea degree in Electrical Engineering from the University of Rome in 1965 and the Libera Docenza in Automatic Control from the University of Rome in 1969. Since 1975, he is Professor of Automatic Control at this University. He has held visiting positions in various leading Universities, which include the University of Illinois at Urbana-Champaign, the University of California at Berkeley, the ETH in Zurich. Since 1989 he has also been regularly collaborating with Washington University in St. Louis.

In 1996, at the opening of 13th IFAC World Congress in San Francisco, Dr. Isidori received the “Georgio Quazza Medal”. This medal is the highest technical award given by the International Federation of Automatic Control, and is presented once every third year for lifetime contributions to automatic control science and engineering. The Georgio Quazza Medal was awarded to Dr. Isidori for “pioneering and fundamental contributions to the theory of nonlinear feedback control”. He is also the recipient of the Ktesibios Award, from the Mediterranean Control Association (in 2000) and of the Bode Lecture Award, from the Control Systems society of IEEE (in 2001). In 1986 he was elected Fellow of IEEE and in 2005 he was elected Fellow of IFAC.

Dr. Isidori is listed in the Highly-Cited database (<http://isihighlycited.com>) among the top mostcited authors in Engineering. He is currently President the International Federation of Automatic Control (IFAC). He is author of 8 books, more than 100 articles on archival journals, 16 book chapters and more than 100 papers on refereed conference proceedings, for a large part on the subject of nonlinear feedback design. He is also also editor/coeditor of 19 volumes of Conference proceedings.

He received the “G.S.Axelby Outstanding Paper Award” from the Control Systems Society of IEEE in 1981, for his technical contributions to the application of differential geometry to the problem of noninteracting control of nonlinear systems, and in 1990, for his technical contributions to the solution of the problem of asymptotic regulation and tracking in nonlinear systems. He also received from the IFAC the “Automatica Prize” in 1991 for his technical contributions to the application the notion of zero dynamics in problems of feedback stabilization and in 2005 for his technical contributions to the active suppression of periodic disturbances in rotating machines.