

Alain BENSOUSSAN

Curriculum Vitae

Birth date : 5/12/40

Birth Place : Tunis, Tunisia

Citizenship : French

DISTINCTIONS

- Member of the French Academy of Sciences - 2003, Correspondent Member 1986
- Member of the French Academy of Technology, 2000
- Member of the International Academy of Astronautics -1999
- Member of Academia Europae 1985
- Fellow IEEE - 1985
- Von Humboldt Prize - 1984
- Légion d'Honneur (Officier) - 2003
- Ordre National du Mérite (Commandeur) - 2000
- BundesVerdienst Kreuz (Officier) - 2003

TRAINING

- Ecole Polytechnique, graduated in 1962.
- Ecole Nationale de la Statistique et de l'Administration Economique, graduated in 1965.
- PhD in Mathematics, 1969, Paris.

PROFESSIONAL CAREER

- Distinguished Research Professor, School of Management, University of Texas at Dallas, from August 2004
- Director, International Center for Decision and Risk Analysis, School of Management, from September 2004
- Associate then Full Professor at the University Paris-Dauphine, from 1969 to 2004
- Emeritus Professor at the University of Paris Dauphine, from 2004
- Part time Professor at the Ecole Polytechnique from 1970 to 1986
- Part time Professor at the Ecole Normale Supérieure from 1980 to 1985
- On Leave at the European Institute for advanced Studies in Management, Brussels, as Professor from 1971 to 1973, then as Director from 1975 to 1977.
- Chairman of the Mathematics Department of the University Paris Dauphine, from 1975 to 1977.
- President of INRIA, Institut National de Recherche en Informatique et Automatique, from 1984 to 1996.
- President of CNES (Centre National d'Etudes Spatiales) from January 1996 to February 2003.
- Chairman of ESA Council (European Space Agency) from July 1999 to July 2002

SCIENTIFIC RESPONSABILITIES

- Vice Chairman of the IFAC "Mathematics of control" Committee from 1978 to 1981.
- Member of the organizing Committee of the IFAC World Congress (1981).
- Member of the selection Committee for the session Control Theory and Optimization, International Congress of Mathematics, Helsinki 1978 and Chairman for the same session, Warsaw 1982.
- Chairman of AFIRST, Franco-Israeli Association for Science and Technology from 1992 to March 1999.
- Member of the Advisory Council of the Institute for Systems Research, University of Maryland.
- Member of the Board of the Pitman Advanced Publishing Program in Mathematics.
- Member of the Advisory Board of Mathematical Finance.
- Editor in Chief of Asymptotic Analysis Journal (IOS Press).
- Member of the Editorial Board of the following journals
 - Journal of Applied Mathematics and Optimization
 - Journal of Nonlinear Analysis
 - Numerical Functional Analysis and Applications
 - Policy Analysis and Information Systems
 - Sciences de Gestion
 - Systems and Control Letters
 - Acta Applicandae Mathematicae
 - Stochastic Analysis and Applications
 - Control Theory and Advanced Technology (C-TAT)
 - International Journal on Stochastic Hydrology and Hydraulics
 - Kybernetes
 - Optimal Control - Applications and Methods
 - Applied Mathematics Letters
 - Progress in Systems and Control Theory
 - Mathematical Models and Methods in Applied Sciences (M3AS)
 - Nonlinear Functional Analysis and Control Theory
 - Applied Mathematical Finance

Description of the Research Works

1 INTRODUCTION

Trained in Control Theory, my main field of expertise consists in connecting methods from Analysis and Stochastic Processes in view of solving concrete problems of applied mathematics, not necessarily arising from Control.

In the course of my scientific career I have supervised around 20 PhD students.

2 DESCRIPTION OF RESULTS

2.1 STOCHASTIC PARTIAL DIFFERENTIAL EQUATIONS

I was among the early initiators of the theory of stochastic PDE in the sense of Ito. I worked in particular, alone or in cooperation, on stochastic monotone equations, stochastic Navier-Stokes equations, stochastic variational inequalities, and more recently on stochastic inertial manifolds.

This theory has found some of its most interesting applications in the study of nonlinear filtering theory, where the work of my former student PARDOUX is a reference.

Note that numerical resolution is now within reach, which makes this field of research quite active and quite useful for applications.

2.2 FILTERING AND CONTROL OF STOCHASTIC DISTRIBUTED SYSTEMS

These problems have been at the origin of my research. In particular my thesis (under the supervision of J.L. LIONS) was devoted to Kalman filtering for linear systems with white noise inputs on both time and space. My main contribution was to make use of the theory of cylindrical measures of Gelfand Vilenkin and L. Schwartz. This permits a rigorous approach to a large variety of problems, provided the model is linear.

I was in particular able to apply these techniques to a bidimensional model playing a role in image processing, or to the problem of optimal location of sensors.

In the problem of control, I contributed strongly to the theory of necessary conditions, and to a rigorous approach of Dynamic Programming via nonlinear semi-groups.

The main field of application concerns the stochastic control of systems with partial information, which naturally has a huge domain of applications.

2.3 OPTIMAL STOPPING, IMPULSE CONTROL, VARIATIONAL AND QUASI VARIATIONAL INEQUALITIES

I discovered, which is now standardly used, that variational inequalities corresponded to the dynamic programming treatment of optimal stopping, and then solved, with J. L. LIONS, the impulse control problem, via a new theory, called the theory of quasi variational inequalities. This has initiated a long and fruitful cooperation on this topic with J.L. LIONS and many colleagues and students. Many applications of this theory concern old and new problems of Operations Research and Management, as well as Physics and Mechanics.

2.4 REGULARITY of NONLINEAR SYSTEMS of ELLIPTIC and PARABOLIC PDE and APPLICATIONS

Stochastic Nash differential games lead to systems of elliptic and parabolic PDE. The regularity of solutions is extremely important for obtaining a Nash point. This has motivated a longstanding cooperation with J. FREHSE, one of the worldwide specialists of the regularity of elliptic systems. I have also solved with him the ergodic case, which even in the case of one equation was open in its full generality.

2.5 ROBUST CONTROL and RISK-SENSITIVE CONTROL

My interest for this domain stems from its connection with the field of Risk sensitive stochastic control. In fact, I first solved with J. VAN SCHUPPEN the problem of finding a sufficient statistics (of the same size as the state, which was an open problem) for the LEG (Linear Exponential Gaussian) control. More recently, in cooperation with J. BARAS and R. ELLIOTT, for the partial information case, and H. NAGAI and J. FREHSE for the full information case, I have contributed several results to justify some earlier formal treatment. The connection between robust control and risk sensitive control can be best seen through small noise introduction and singular perturbations. This is a field of very active research worldwide, by the broadness of the applications and the use of many mathematical techniques. It is one of my current research areas.

2.6 EXACT CONTROLLABILITY

After the introduction of the HUM method by J. L. LIONS, and its use by many authors, I got interested in developing a general theory of exact controllability for infinite dimensional systems, where the dynamics is driven by a skew-symmetric operator. In this way, one can unify most of the existing results concerning wave equations, Maxwell equations, ...

2.7 HOMOGENIZATION

Initiated by the probabilistic interpretation of homogenization, my interest in this domain has widened into an important cooperation with J.L. LIONS and G. PAPANICOLAOU, where we have developed many general approaches to this very fruitful theory.

More recently with L. BOCCARDO and F. MURAT I have considered the homogenization of Bellman equations, and with G. BLANKENSHIP the case of random homogenization.

2.8 REGULAR and SINGULAR PERTURBATIONS

Homogenization can be viewed as a particular situation of singular perturbations. But of course many other situations can be considered. It was natural for me to be interested in their application to Control theory, both deterministic and stochastic, and in the latter case with full or partial information. Many particularly useful results can be obtained in the case of partial information, where one can derive approximate but accurate finite dimensional feedback laws, where the optimal one is infinite dimensional.

2.9 SPECIFIC PROBLEMS in OPERATIONS MANAGEMENT and in FINANCE

Since Control Theory has a lot of applications in many areas of Quantitative Management, I have cooperated with several specialists of the field to obtain the solution of concrete problems. My current interest lies in Operations Management and in Finance. I have been working in the design

of complex options with M. CROUHY and D. GALAI. More recently, with my student H. Julien, I have investigated models of options for incomplete markets, where the incompleteness arises from "frictions" in the management of portfolios. Another approach to this problem has been developed with N. TOUZI and J. L. MENALDI, using penalty approximations and Viscosity methods. Since I joined UTD, the University of Texas at Dallas, I have been working on Inventory Control problems, with S. Sethi, M. Cakanyldirim, and PhD students. Our research focuses on stochastic models with partial information (a field where little is available), on service constraint models, on s, S policies. I have been also involved , jointly with S. SETHI, in models of Economic Growth developed by K.J. ARROW and al., taking into account population growth aspects.

Description of managerial and scientific responsibilities

3 BEFORE MY RESPONSIBILITY as PRESIDENT of INRIA

At the University I have been chairman of the mathematics department for 2 years (1975-1977) and chairman of the CEREMADE (applied mathematics research laboratory of the University Paris Dauphine) for another 2 years (1973-1975).

This has involved supervising teaching and research programs, looking for new teaching and research staff, and managing corresponding budgets. From 1977 to 1979, I have been Director of EIASM, the European Institute for Advanced Studies in Management in Brussels. I had previously, in 1971-1973 been one of the first two French faculty of this newly created institute. This institute had been created with the help of the Ford Foundation, at the initiative of several european organizations, to strenghten research and advanced training in Management in Europe, at a time where very little existed. My presence was justified by the fact, that I was one of the few european applied mathematicians interested in quantitative management and by the active role of my university in the creation of this institute.

As Director, I had to implement a new strategy, due to the scarcity of resources which unfortunately but inevitably hits this kind of international organization, born at a period of prosperity and in a specific context of justification, which is less present after several years. In fact, from a full staff faculty, which is very costly, I turned to the concept of scientific network. This is a concept which is widely used now, especially since the European Community has initiated a European Research Program (in 1983) and is now at the core of the European research area, proposed for the 6th framework program, but was rather original in those days. Keeping this concept operational till now has permitted EIASM to survive and to play an active role in unifying the european scientific community in Management.

Needless to say, I got there experience in an international scientific environment, had to bridge some cultural gaps, had to discuss budget issues with several organizations of different countries. At the same time, I was not, being a mathematician, among the most representative of the field. I tried, with success, to use this drawback as an asset, since I could be considered as neutral by all the active (in those days not so many) members of the community, and I brought the spirit of a research oriented director, in a domain which had not so much cultivated this flavor in the past, (again in those days in Europe).

4 RESPONSIBILITY as PRESIDENT of INRIA

I have been appointed President of INRIA on December 18, 1984 . This appointment is made by two Ministers, the Minister of Science and the Minister of Industry. The term is for 3 years, renewable. I have acomplished 4 mandates.

When I left INRIA it had around 1500 staff, in which half are full time civil servants. It had a budget of more than 100 M\$, including 20% of owned resources (not governmental subsidy). It is located in 5 campuses: Rocquencourt, Sophia-Antipolis, Rennes, Nancy and Grenoble, plus a few people scattered elsewhere, in particular in Toulouse.

Its main responsibility is to bridge the gap between Fundamental Research in Computer Science, Control, Scientific Computing and the real needs of industry, both information technology industry and economic sectors using information technology. Although not a university, INRIA has a fundamental role in training, and it contains 500 student members among its staff. Since 1984, INRIA has almost doubled its size, has grown from 3 to 5 campuses, has put forward an active strategy of transfer, not only by getting contracts with industry, but also being quite active in encouraging spin off companies (around 20 in 10 years, representing the creation of 800 high tech jobs). INRIA has been very present on the international scene, not only by the reputation and visibility of its

staff, but also by many important international agreements, including an agreement with NSF, and the opening of a center in Moscow, the Lyapunov Institute in cooperation with Moscow State University. The most recent and spectacular illustration of this presence is the creation under the sponsorship of MIT and INRIA, of the International World Wide Web Consortium, which will gathers around a hundred of organizations (mainly industries) from America, Europe and Asia. Being President of INRIA means being both Chairman of the Board and Director of the Institute. It involves supervising the scientific orientations and the strategy of transfer and international cooperation. The President has to deal constantly with ministries and local authorities, with industry representatives and with academic institutions. He has a wide range of action, provided he can be convincing internally about the objectives and externally about the achievements of the institute. Due to the role of INRIA, I have been appointed, as member or chairman, in many committees, boards or scientific councils, of other organizations, or playing a national or an international role. Of course, this has increased my knowledge and experience of the scientific and industrial environment, as well has allowed me to promote the realizations of the institute. In addition, I had to become a generalist in the field of information technology and to understand the main scientific and industrial issues. I had to write several synthesis reports, in particular to present lectures to an audience of non specialists (scientists of other disciplines, or decision makers from industry or government), or to define the position of INRIA on main issues of concern.

5 RESPONSIBILITY as PRESIDENT of CNES

I have been appointed President of CNES on January 31, 1996, and elected Chairman of the Council of the European Space Agency, for a three years term starting July 1st, 1999. I have been renewed in my position of President of CNES for a three year term ending in February 2003. CNES is the French space Agency, as well as a centre of excellence for technology. It represents 2500 persons, including the space port of Europe, in Kourou, French Guyana.

The responsibility of the President concerns the definition of the strategy and the orientations of the Center, in particular the reinforcement of the European cooperation and international programs. Space is a strategic issue of the construction of Europe, and in this position I have had to deal a lot with industry. One of the important tasks concerns the European space programs and the restructuring issues, both in industry and in the public sector.

6 RESPONSIBILITY as DIRECTOR of ICDRIA

The International Center for Decision and Risk Analysis (ICDRIA) has been created in the School of Management of the University of Texas at Dallas in August 2004. The objective is to develop research in Risk Management and Decision Making, across industry or in relation with security issues. This is a fast growing field, with a strong interdisciplinary flavor. The goal is to build in a few years a full program of education and applied research in this domain.

LIST of PUBLICATIONS

BOOKS

- Filtrage Optimal des Systèmes Linéaires (Dunod, 1971).
- Management Application of Modern Control Theory, (North Holland, 1974), with G. HURST & B. NASLUND.
- Applications des Inéquations Variationnelles en contrôle Stochastique, (Dunod, 1978), with J.L. LIONS (english translation: Application of Variational Inequalities in Stochastic Control, North Holland, 1982).
- Asymptotic Methods in Periodic Media, (North Holland, 1978), with J.L. LIONS & G. PAPANICOLAOU.
- Stochastic Control by Functional Analysis Methods, (North Holland, 1982).
- Impulsive Control and Quasi-Variational Inequalities, (Dunod, 1982), with J.L. LIONS, traduction russe 1987.
- Mathematical Theory of Production Planning, (North Holland, 1983), with M. CROUHY & J. M. PROTH.
- Perturbations Methods in Optimal control, (Dunod-Gauthier Villars, 1988).
- Stochastic Control with Partial Information (Cambridge University Press), 1992.
- Representation and Control of Infinite Dimensional Systems, with G. Da Prato, M. Delfour et S.K. Mitter, (Birkhauser) vol.1, 1992.
- Representation and Control of Infinite Dimensional Systems, with G. Da Prato, M. Delfour et S.K. Mitter, (Birkhauser) vol.2, 1993.
- Regularity results for nonlinear Elliptic systems and applications, with J. FREHSE, (Springer), Applied Mathematical Sciences, vol. 151, 2002.

EDITED BOOKS

- 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th International Conference on Analysis and optimization of Systems, (Springer Verlag, Lecture Notes, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990), with J.L. LIONS.
- Applied Optimal Control (North Holland, 1978), with P. KLEINDORFER & C. S. TAPIERO.
- Stochastic Optimal Control and Applications, (North Holland, 1980), with P. KLEINDORFER & C. S. TAPIERO.
- Mathematical Techniques of Optimization, Control and Decision, (Annals of the CEREMADE), (Birkhäuser, 1981), with J. P. AUBIN & I. EKELAND.

ARTICLES

More than 300 articles & communications in International Journals and proceedings.

1967

- Une méthode d'Identification de Valeur Initiale, C.R.A.S. Paris, t. 265, pp. 724-727, A. Nov. 1967.

1968

- Sur l'Identification des Systèmes Aléatoires, C.R.A.S. Paris, t. 266, pp. 1229-1232, Série A, Juin 1968.
- Sur l'Analogie entre les Méthodes de Régularisation et de Pénalisation, (with P. KENNETH) R.I.R.O., 2e année, N° 13, pp. 13-26, 1968.

1969

- Equations Intégrales Opérationnelles Stochastiques, C.R.A.S. Paris, t. 269, pp. 423-425, Sept. 1969.
- Sur les propriétés de la Solution d'une Equation Intégrale Opérationnelle stochastique, C.R.A.S. Paris, t. 269, pp. 457-459, Sept. 1969.
- Identification de Systèmes Gouvernés par des Equations aux Dérivées Partielles, dans Computing Methods in Optimisation Problems, Academic Press, N. Y. 1969. pp. 25-34.
- Contrôle Optimal Stochastique de Systèmes Gouvernés par des Equations aux Dérivées Partielles de Type Parabolique, Rendiconti di Matematica, (1. 2) Vol. 2 série Vi, pp. 135-173, Rome 1969.
- Game Theory for Systems Governed by Partial Differential Equations, in Proceedings of the First International Conference on Differential Games, pp. V5-V8, Amherst, Mass., 1969.
- Identification et Filtrage, Cahiers de l'IRIA N° 1, pp. 1-253, Fév. 1969.

1970

- Approximation des problèmes de contrôle optimal, with A. BOSSAVIT & J. C. NEDELEC, Cahiers de l'IRIA N° 2, pp. 104-172, 1970.
- Statistical problems in Hilbert spaces, application to filtering theory in, Kybernetika, pp. 270-279, Prague 1970.
- On the best linear feedback for systems governed by differential operational equations, dans Symposium on Optimization, Springer Verlag, Lecture Notes in Mathematics, pp. 53-57, Berlin 1970.
- Optimization, dans Encyclopédie des Sciences et des techniques, (Déc. 1970).

1971

- Saddle points of convex functionals with applications to linear quadratic differential games, dans Differential Games and Related Topics, North Holland, pp. 177-19..., 1971
- On the approximate Kalman-Bucy filter, Proceedings of the Hawaiï Conference on System Science, pp. 462-46, Hawaiï 1971.
- Filtering theory : a comparison between lumped and distributed systems, Memoria de la Conferencia Internacional sobre sistemas, Redes y Computadoras, pp. 160-163, Mexico 1971.
- Evaluation of multi level approach in large scale optimization, dans Proceedings of the Joint Automatic Control Conference, pp. 294a-6294b, St Louis, 1971.
- On the separation principle for distributed parameter systems, Proceedings of the IFAC symposium on Control of Distributed Parameter Systems, pp. 1-7, Banff, Canada, 1971.
- Statistical estimation in Hilbert spaces : Application to Bucy's Representation theorem, dans Information Theory, Statistical Decision Functions, Random Processes, Transactions of the Sixth Prague Conference, pp. 107-124, Sept. 19-25, 1971.
- Points de Nash en boucle fermée pour les systèmes paraboliques linéaires with critère quadratique, Note C.R.A.S. (20 Sept. 1971), t. 273, pp. 499-501.

1972

- Optimal filtering for linear stochastic hereditary differential systems, with M. C. DELFOUR & S. K. MITTER, IEEE Conference on Decision and Control, pp. 1-3, New Orleans, 1972.
- Optimization of sensors location in a distributed filtering problem, dans Stability of Stochastic Dynamical Systems, Springer Verlag, Lecture Notes in Mathematics, N° 294, pp. 62-84, Berlin 1972.
- Equations aux dérivées partielles stochastiques non linéaires, with R. TEMAM, Israël Journal of Mathematics, Vol. 11, N° 1, pp. 95-129, 1972.
- Price decentralization in the case of interrelated payoffs, dans Techniques of Optimization, Academic Press., 1972.
- On the filtering theory for some stochastic distributed parameter systems, with J.L. LIONS, Nov. 1972.

1973

- Problèmes de temps d'arrêt optimal et inéquations variationnelles paraboliques, with J.L. LIONS, Applicable Analysis, Vol. 3, pp. 267-294, 1973.
- Inspection decisions in a multistage production process, with E. G. HURST Jr., G. NISSEN, J. P. QUADRAT, Proceedings of XX International Meeting - The Institute of Management Sciences E. Shlifer (ed) Vol. 1, pp. 223-227, Tel Aviv, June 24-29, 1973.
- Equations stochastiques du type Navier-Stokes, with R. TEMAM, J. of Functional Anal. Vol N° 2, pp. 195-222, Juin 1973.
- Impulse controls and dynamic inventories problems with non constant demand rate, Proceedings of XX International Meeting - The Institute of Management Sciences E. Shliefer (ed) Vol. 1, pp. 223-227, Tel Aviv, June 24-29, 1973. with E. G. HURST Jr.
- Méthodes de décomposition appliquées au contrôle optimal de systèmes distribués, Springer Verlag, Lecture Notes on Computer Science N° 3, Rome, May 7-11, 1973.
- Nouvelle formulation de problèmes de contrôle impulsif et applications, with J.L. LIONS, C.R.A.S. Paris, t. 276, série A, pp. 1189-1192, 1973.
- Contrôle impulsif et inéquations quasi variationnelles stationnaires, with M. GOURSAT & J.L. LIONS, C.R.A.S. Paris, t. 276, série A, pp. 1279-1284, 1973.
- Contrôle impulsif et inéquations quasi variationnelles d'évolution, with J.L. LIONS, C.R.A.S. Paris, t. 276, série A, pp. 1333-1338, 1973.
- Inéquations variationnelles non linéaires du premier et du second ordre, with J.L. LIONS, C.R.A.S. Paris, t. 276, série A, pp. 1411-1415, 1973.
- Généralisation du théorème de Girsanov, Mathematicae Notae, Université Nationale de Rosario, Ano XXIII 72/73, pp. 39-63.
- Approximation numérique d'inéquations quasi variationnelles stationnaires, with J.L. LIONS, Colloque IRIA Déc. 1973 17-21/12/73, Lecture Notes in Computer Sciences, Vol. 11, pp. 325-338, Springer Verlag Heidelberg (1974).

1974

- Points de Nash dans le cas de fonctionnelles quadratiques et jeux différentiels linéaires à N personnes, SIAM J. of Control, Vol. 12, N° 3, Août 1974.
- Utilisation du filtre de Kalman pour la prédiction des séries économiques, Publ. Economie Appliquée, Tome 27, N° 2-3, Paris 1974.

- Contrôle impulsionnel et contrôle continu. Méthode des inéquations quasi variationnelles non linéaires, with J.L. LIONS, C.R.A.S. Paris, t. 278, série A, pp. 675-679, 4 Mars 1974.
- Contrôle impulsionnel et systèmes d'inéquations quasi variationnelles, with J.L. LIONS, C.R.A.S. Paris, t. 278, série A, pp. 747-751, 11 Mars 1974.
- Sur de nouveaux problèmes aux limites pour des opérateurs hyperboliques, with J.L. LIONS, C.R.A.S. Paris, t. 278, série A, pp. 1345-1349, 20 Mai 1974.
- Differential games with stopping times and non linear variational inequalities, with A. FRIEDMAN, J. of Functional Analysis, Vol. 16, N° 3, pp. 305-352, Juillet 1974.
- Quelques remarques sur les inéquations quasi variationnelles décroissantes, Congrès Analyse convexe, Proceedings du Colloque de Saint Pierre de Chartreuse with J.L. LIONS, Springer Verlag, 1974.
- Contrôle impulsionnel et inéquations quasi variationnelles, Conférence au Congrès UMI Vancouver, Août 1974.
- Introduction to the theory of impulse control, Trieste 1974, IREA SMR 17/39.
- Differential games with impulse times, with J.L. LIONS, Proceedings de la Conference IEEE on Decision and Control Phoenix (Ariz), Nov. 20-22, 1974.
- Stochastic differential equations in bounded domains and singular perturbation for variational inequalities with Neumann boundary conditions, Springer Verlag, Lecture Notes Proceedings of the 1974 Vict. Conference on Stochastic differential equations edited by M. Pinsky, N° 451, pp. 8-25, 1974.
- Sur quelques questions liées au contrôle optimal, with J.L. LIONS, Article dédié au Professeur PETROWSKI, Mars Avril 1974, Uspeki XXIX 2 (77-85).
- Sur des nouveaux problèmes aux limites pour des opérateurs hyperboliques, C.R.A.S. Paris, t. 278, 20 Mai 1974, with J.L. LIONS.

1975

- Optimum inventory control with deterministic and stochastic deterioration. An application of distributed parameter control problems, IEEE Transactions on Automatic Control. Juin 1975, with G. NISSEN et C. S. TAPIERO.
- Optimal control of stochastic linear distributed parameter systems, SIAM J. of Control, Vol. 13, N° 4, pp. 904-926, Juillet 1975, with M. VIOT.
- Nouvelles méthodes en contrôle impulsionnel, J. of Applied Math. and Optimization, Vol. 1, N° 4, pp. 289-312, ed. Springer Verlag, New York, with J.L. LIONS.
- Problèmes de temps d'arrêt optimaux et perturbations singulières dans les inéquations variationnelles, Colloque IRIA, Juin 1975, Lecture Notes in Economics and Mathematical System, Vol. 107, pp. 567-584, Springer Verlag, Heidelberg.
- Sur le contrôle impulsionnel et les inéquations quasi-variationnelles d'évolution, Note C.R.A.S., t. 280, pp. 1049-1453, 28 Avril 1975, with J.L. LIONS.
- Sur quelques phénomènes asymptotiques stationnaires, Note C.R.A.S. Paris, t. 281, pp. 89-94, 21 Juillet 1975, with J.L. LIONS et G. PAPANICOLAOU.
- Sur quelques phénomènes d'évolution, Note C.R.A.S., t. 281, pp. 317-322, 8 Septembre 1975, with J.L. LIONS et G. PAPANICOLAOU.
- Control of stochastic Partial Differential Equations, in Identification, Estimation and Control of Distributed Parameter System, ed. par W. H. Ray et D. G. Lainotis.
- Sur les temps d'arrêt optimaux et les inéquations variationnelles d'évolution, Note C.R.A.S. Paris, t. 280, Série A, pp. 989-992, 21 Avril 1975, with J.L. LIONS.

- Sur les méthodes de décomposition, de décentralisation et de coordination et applications, dans Méthodes de Décomposition, édité par J.L. Lions et G. Marchuk, Dunod, Paris 1975, Tome 2, with J.L. LIONS et R. TEMAM.
- Optimal impulse and continuous control : method of non linear quasi-variational inequalities, dédié au Prof. Nikolski, Proceedings of Steklov Institute of Mathematics, N° 134, 1975, Moscou, URSS, with J.L. LIONS.

1976

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- Homogénéisation et perturbations singulières, in honor to Professeur SOBOLEV, Séminaire de Math. de l'Académie des Sciences de Novosibirsk. with J.L. LIONS.
- On the support of the solution of some variational inequalities of evolution, Journal of Mathematical Society of Japan, Vol. 28, N° 1, pp. 1-17, Janvier 1976. with J.L. LIONS.
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- Homogénéisation, correcteurs et problèmes non linéaires, Note C.R.A.S. Paris, t. 282, série A, pp. 1277-1282, 14 Juin 1976. with J.L. LIONS et G. PAPANICOLAOU.
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1977

- Sur la convergence d'opérateurs différentiels with potentiel fortement oscillant, Note C.R.A.S. Paris, t. 284, série A, pp. 587- 592, 14 Mars 1977. with J.L. LIONS et G. PAPANICOLAOU.
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- Estimates of the free boundary for quasi-variational inequalities, Comm. in Partial Differential Equations 2(3), pp. 297-321, 1977, with H. BREZIS et A. FRIEDMAN.
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