1.	Record Nr.	UNINA990008106370403321
	Autore	Roggi, Carla
	Titolo	Igiene degli alimenti e nutrizione umana : la sicurezza alimentare / Carla Roggi, Giovanna Turconi
	Pubbl/distr/stampa	Roma : EMSI, c2003
	ISBN	88-86669-32-1
	Descrizione fisica	XXII, 613 p. : ill. ; 27 cm
	Altri autori (Persone)	Turconi, Giovanna
	Disciplina	612.3 613.2
	Locazione	FAGBC
	Collocazione	60 613.2 ROGC 2003 60 612.3 B 43
	Lingua di pubblicazione	Italiano
	Formato	Materiale a stampa
	Livello bibliografico	Monografia

2. Record Nr. UNINA9910585793103321

Autore	Cacuci Dan Gabriel
Titolo	The nth-Order Comprehensive Adjoint Sensitivity Analysis Methodology, Volume I : Overcoming the Curse of Dimensionality: Linear Systems / / by Dan Gabriel Cacuci
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2022
ISBN	9783030963644 9783030963637
Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (373 pages)
Disciplina	629.8312 003.5
Soggetti	Mathematical physics Computer simulation Mathematical models Statistics Energy policy Engineering mathematics Engineering - Data processing Nuclear physics Computational Physics and Simulations Mathematical Modeling and Industrial Mathematics Statistical Theory and Methods Energy Policy, Economics and Management Mathematical and Computational Engineering Applications Nuclear Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Chapter 1. Introduction and Motivation: Breaking the Curse of Dimensionality in Sensitivity and Uncertainty Analysis. Part A: Function-Valued Responses -- Chapter 2. Part A: Function-Valued Responses-The First- and Second-Order Comprehensive Adjoint Sensitivity Analysis Methodologies for Linear Systems with Function-Valued

Responses -- Chapter 3. The Third-Order Comprehensive Adjoint Sensitivity Analysis Methodology (C-ASAM-3) for Linear Systems with Function-Valued Responses -- Chapter 4. The Fourth-Order Comprehensive Adjoint Sensitivity Analysis Methodology (C-ASAM-4) for Linear Systems with Function-Valued Responses -- Chapter 5. The Nth-Order Adjoint Sensitivity Analysis Methodology (C-ASAM-N) for Linear Systems with Function-Valued Responses -- Chapter 6. Part B: Scalar-Valued Responses-The Fourth-Order Comprehensive Adjoint Sensitivity Analysis Methodology (C-ASAM-4) for Linear Systems with Scalar-Valued Responses -- Chapter 7. The Nth-Order Adjoint Sensitivity Analysis Methodology(C-ASAM-N) for Linear Systems with Scalar-Valued Responses.

Sommario/riassunto

The computational models of physical systems comprise parameters, independent and dependent variables. Since the physical processes themselves are seldom known precisely and since most of the model parameters stem from experimental procedures which are also subject to imprecisions, the results predicted by these models are also imprecise, being affected by the uncertainties underlying the respective model. The functional derivatives (also called “sensitivities”) of results (also called “responses”) produced by mathematical/computational models are needed for many purposes, including: (i) understanding the model by ranking the importance of the various model parameters; (ii) performing “reduced-order modeling” by eliminating unimportant parameters and/or processes; (iii) quantifying the uncertainties induced in a model response due to model parameter uncertainties; (iv) performing “model validation,” by comparing computations to experiments to address the question “does the model represent reality?” (v) prioritizing improvements in the model; (vi) performing data assimilation and model calibration as part of forward “predictive modeling” to obtain best-estimate predicted results with reduced predicted uncertainties; (vii) performing inverse “predictive modeling”; (viii) designing and optimizing the system. This 3-Volume monograph describes a comprehensive adjoint sensitivity analysis methodology, developed by the author, which enables the efficient and exact computation of arbitrarily high-order sensitivities of model responses in large-scale systems comprising many model parameters. The qualifier “comprehensive” is employed to highlight that the model parameters considered within the framework of this methodology also include the system’s uncertain boundaries and internal interfaces in phase-space. The model’s responses can be either scalar-valued functionals of the model’s parameters and state variables (e.g., as customarily encountered in optimization problems) or general function-valued responses. Since linear operators admit bona-fide adjoint operators, responses of models that are linear in the state functions (i.e., dependent variables) can depend simultaneously on both the forward and the adjoint state functions. Hence, the sensitivity analysis of such responses warrants the treatment of linear systems in their own right, rather than treating them as particular cases of nonlinear systems. This is in contradistinction to responses for nonlinear systems, which can depend only on the forward state functions, since nonlinear operators do not admit bona-fide adjoint operators (only a linearized form of a nonlinear operator may admit an adjoint operator). Thus, Volume 1 of this book presents the mathematical framework of the nth-Order Comprehensive Adjoint Sensitivity Analysis Methodology for Response-Coupled Forward/Adjoint Linear Systems (abbreviated as “nth-CASAM-L”), which is conceived for the most efficient computation of exactly obtained mathematical expressions of arbitrarily-high-order (nth-order)

sensitivities of a generic system response with respect to all of the parameters underlying the respective forward/adjoint systems. Volume 2 of this book presents the application of the nth-CASAM-L to perform a fourth-order sensitivity and uncertainty analysis of an OECD/NEA reactor physics benchmark which is representative of a large-scale model comprises many (21,976) uncertain parameters, thereby amply illustrating the unique potential of the nth-CASAM-L to enable the exact and efficient computation of chosen high-order response sensitivities to model parameters. Volume 3 of this book presents the “nth-Order Comprehensive Adjoint Sensitivity Analysis Methodology for Nonlinear Systems” (abbreviation: nth-CASAM-N) for the practical, efficient, and exact computation of arbitrarily-high order sensitivities of responses to model parameters for systems that are also nonlinear in their underlying state functions. Such computations are not feasible with any other methodology. The application of the nth-CASAM-L and the nth-CASAM-N overcomes the so-called “curse of dimensionality” in sensitivity and uncertainty analysis, thus revolutionizing all of the fields of activities which require accurate computation of response sensitivities. Since this monograph includes many illustrative, fully worked-out, paradigm problems, it can serve as a textbook or as supplementary reading for graduate courses in academic departments in the natural sciences and engineering.