



## Handbook of dynamic data driven applications systems.

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Monografía

The Handbook of Dynamic Data Driven Applications Systems establishes an authoritative reference of DDDAS, pioneered by Dr. Darema and the co-authors for researchers and practitioners developing DDDAS technologies. Beginning with general concepts and history of the paradigm, the text provides 32 chapters by leading experts in ten application areas to enable an accurate understanding, analysis, and control of complex systems; be they natural, engineered, or societal: The authors explain how DDDAS unifies the computational and instrumentation aspects of an application system, extends the notion of Smart Computing to span from the high-end to the real-time data acquisition and control, and manages Big Data exploitation with high-dimensional model coordination. The Dynamically Data Driven Applications Systems (DDDAS) paradigm inspired research regarding the prediction of severe storms. Specifically, the DDDAS concept allows atmospheric observing systems, computer forecast models, and cyberinfrastructure to dynamically configure themselves in optimal ways in direct response to current or anticipated weather conditions. In so doing, all resources are used in an optimal manner to maximize the quality and timeliness of information they provide. Kelvin Droegemeier, Regents Professor of Meteorology at the University of Oklahoma; former Director of the White House Office of Science and Technology Policy We may well be entering the golden age of data science, as society in general has come to appreciate the possibilities for organizational strategies that harness massive streams of data. The challenges and opportunities are even greater when the data or the underlying system are dynamic - and DDDAS is the time-tested paradigm for realizing this potential. Sangtae Kim, Distinguished Professor of Mechanical Engineering and Distinguished Professor of Chemical Engineering at Purdue University

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**Contenido:** 1 Introduction to Dynamic Data Driven Applications Systems -- 2 Tractable Non-Gaussian Representation in Dynamic Data Driven Coherent Fluid Mapping -- 3 Dynamic Data-Driven Adaptive Observations in Data Assimilation for Multi-scale Systems -- 4 Dynamic Data-Driven Uncertainty Quantification via Polynomial Chaos for Space Situational Awareness -- 5 Towards Learning Spatio-Temporal Data Stream Relationships for Failure Detection in Avionics -- 6 Markov Modeling of Time Series via Spectral Analysis for Detection of Combustion Instabilities -- 7 Dynamic Space-Time Model for Syndromic Surveillance with Particle Filters and Dirichlet Process -- 8 A Computational Steering Framework for Large-Scale Composite Structures -- 9 Development of Intelligent and Predictive Self-Healing Composite Structures using Dynamic Data-Driven Applications Systems -- 10 Dynamic Data-Driven Approach for Unmanned Aircraft Systems aero-elastic response analysis -- 11 Transforming Wildfire Detection and Prediction using New and Underused Sensor and Data Sources Integrated with Modeling -- 12 Dynamic Data Driven Application Systems for Identification of Biomarkers in DNA Methylation -- 13 Photometric Steropsis for 3D Reconstruction of Space Objects -- 14 Aided Optimal Search: Data-Driven Target Pursuit from On-Demand Delayed Binary Observations -- 15 Optimization of Multi-Target Tracking within a Sensor Network via Information Guided Clustering -- 16 Data-Driven Prediction of Confidence for EVAR in Time-varying Datasets -- 17 DDDAS for Attack Detection and Isolation of Control Systems -- 18 Approximate Local Utility Design for Potential Game Approach to Cooperative Sensor Network Planning -- 19 Dynamic Sensor-Actor Interactions for Path-Planning in a Threat Field -- 20 Energy-Aware Dynamic Data-Driven Distributed Traffic Simulation for Energy and Emissions Reduction -- 21 A Dynamic Data-Driven Optimization Framework for Demand Side Management in Microgrids -- 22 Dynamic Data Driven Partitioning of Smart Grid Using Learning Methods -- 23 Design of a Dynamic Data-Driven System for Multispectral Video Processing -- 24 Light Field Image Compression -- 25 On Compression of Machine-derived Context Sets for Fusion of Multi-model Sensor Data -- 26 Simulation-based Optimization as a Service for Dynamic Data-driven Applications Systems -- 27 Privacy and Security Issues in DDDAS Systems -- 28 Dynamic Data Driven Application Systems (DDDAS) for Multimedia Content Analysis -- 29 Parzen Windows: Simplest Regularization Algorithm -- 30 Multiscale DDDAS Framework for Damage Prediction in Aerospace Composite Structures -- 31 A Dynamic Data-Driven Stochastic State-awareness Framework for the Next Generation of Bio-inspired Fly-by-feel Aerospace Vehicles -- DDDAS: The Way Forward. .

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