Special Issue Proposal on

*Advances in Managing, Updating and Querying  
Exact and Uncertain Sensor and Stream Databases*

to “Information Systems”, Elsevier

by **Alfredo Cuzzocrea, PhD**



The issue of effectively and efficiently managing, updating and querying *sensor and stream databases* is gaining increasing attention from the database research community. Sensor and stream databases arise in a plethora of emerging application scenarios, ranging from environmental sensor networks to supply chains, from low-level communication networks to RFID deployments, from stock quote tools to network monitoring components, from scientific database applications to statistical analysis environments, and so forth.

In all the application scenarios above, sensor and stream data is both *uncertain* and *imprecise*. Uncertainty and imprecision in sensor and stream data derive from the intrinsic processes generating such data, which may suffer from missing data or faults of sensors/stream-sources, errors occurring in the transmission layer of sensor/stream networks, probabilistic nature of signals traversing sensor/stream networks, and so forth.

While traditional challenges of sensor and stream processing (bounded-memory, single-pass processing, blocking query operators, multi-rate arrivals, and so forth) affect managing, updating and querying exact sensor and stream databases, additional challenges arise when dealing with novel uncertain sensor and stream databases. Hence, innovative models, algorithms and techniques for managing, updating and querying uncertain sensor and stream databases must be devised, perhaps embedding probabilistic or statistical approaches.

With these goals in mind, the proposed IS special issue will cover theoretical as well as practical aspects of managing, updating and querying exact and uncertain sensor and stream databases, thus constituting a milestone in sensor and stream database research, with a rare multi-aspect research vision spanning from elegant models and formalisms to effective and comprehensive methodologies and efficient algorithms.

Relevant research areas for the proposed IS special issue include, but are not limited to, the following ones:

* advanced query algorithms for exact and uncertain sensor and stream databases;
* complex query predicates on exact and uncertain sensor and stream databases (e.g., aggregation predicates);
* temporal and multi-version queries on exact and uncertain sensor and stream databases;
* preference queries on exact and uncertain sensor and stream databases;
* probabilistic queries on exact and uncertain sensor and stream databases;
* pub-sub primitives in networked exact and uncertain sensor and stream databases;
* data cleaning methodologies over exact and uncertain sensor and stream databases;
* querying multiple exact and uncertain sensor and stream databases;
* fusion primitives in networked exact and uncertain sensor and stream databases;
* model-driven acquisition methods for exact and uncertain sensor and stream databases;
* compressed representations of exact and uncertain sensor and stream databases;
* mediator-based architectures for networked exact and uncertain sensor and stream databases.

**[I’m not sure we need your biography especially as it’s not directed to the topic. Also you need no introduction.] Alfredo Cuzzocrea’s Brief Biography.** Alfredo Cuzzocrea is currently a Senior Researcher at the Institute of High Performance Computing and Networking of the Italian National Research Council, Italy, and an Adjunct Professor at the Department of Electronics, Computer Science and Systems of the University of Calabria, Italy. His research interests include multidimensional data modeling and querying, data stream modeling and querying, data warehousing and OLAP, XML data management, Web information systems modeling and engineering, knowledge representation and management models and techniques, Grid and P2P computing, data mining algorithms, information systems modeling methodologies, service-oriented architectures and systems, privacy preserving data management, security in database systems. He is author or co-author of more than 120 papers in referred international conferences (including EDBT, SSDBM, ISMIS, ADBIS, DEXA, DaWaK, DOLAP, IDEAS, SEKE, WISE, FQAS, SAC) and international journals (including DKE, JIIS, IJDWM, WIAS, IJBIDM, IJDMMM). He serves as program committee member of referred international conferences (including ICDE, ICDM, SDM, PKDD, PAKDD, CIKM, ICML, ICDCS, ER, WISE, DASFAA, FQAS, SAC) and as review board member of referred international journals (including TODS, TKDE, TSMC, TSC, IS, DKE, JIIS, IPL, TPLP, COMPJ, DPDB, KAIS, INS, IJSEKE, FGCS). He also serves as PC Chair in several international conferences and as Guest Editor in international journals like JCSS, DKE, KAIS, FI, IJBIDM, IJDMMM and JDIM.