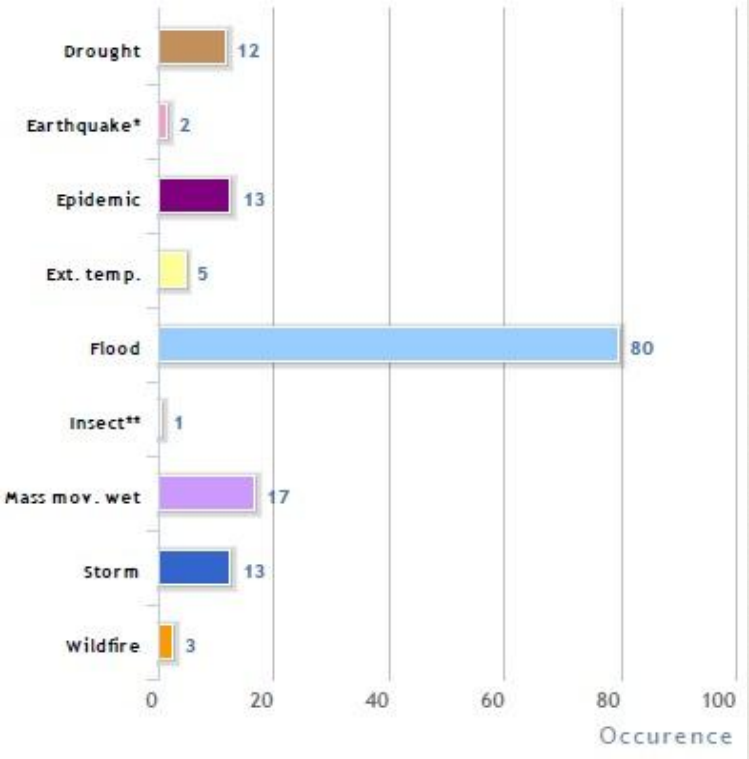
Dynamic Control Heterogeneous Sensors for Flood Management

Systematic Review in Software Engineering

Luiz Fernando Ferreira Gomes de Assis
Prof. Dr. João Porto de Albuquerque
Profa. Dra. Elisa Yumi Nakagawa

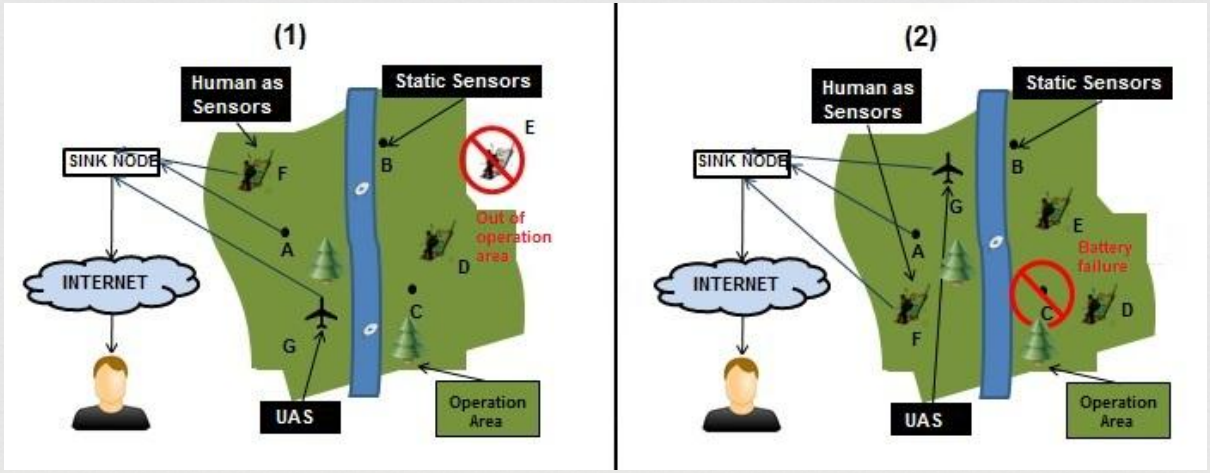
Context

- 3 000 floods have occurred around the world, between 1980 and 2008;
- More than 190 000 deaths;
- Almost U$ 400 million;



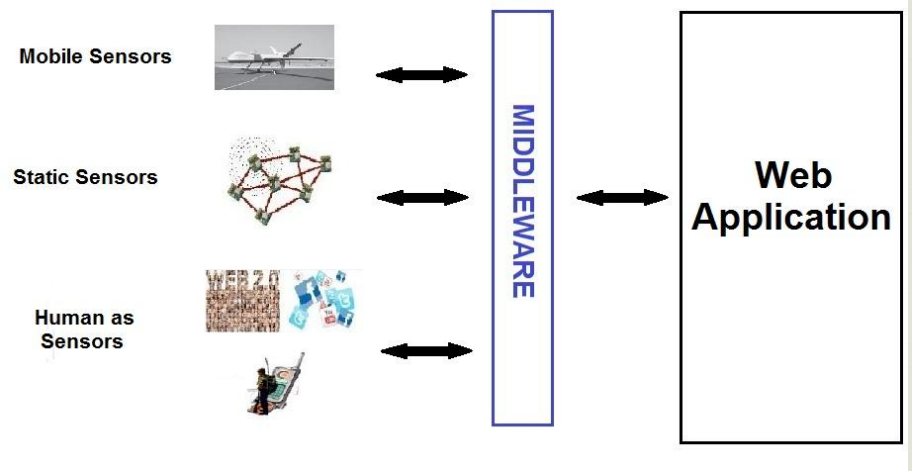
Context

- miscellaneous participation of geosensors, for example, they can fail, they can continuously move and be programmable;
- real time access of geosensors data;
- subscribe geosensors to receive alerts and notifications about their measurements;



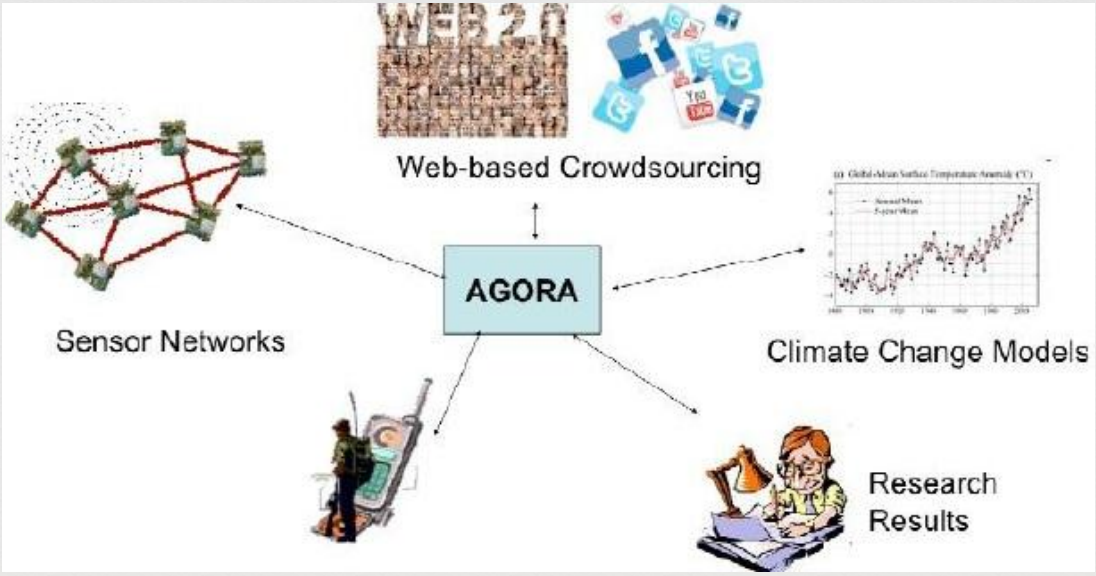
Context

- Middleware that provides interoperable communication between geosensors and web applications;



Context

- **A** **G**eospatial **O**pen Collabo**R**ative **A**rchitecture (AGORA) that builds resilient communities against disasters and climate change impacts



Question

- Q1. How to dynamically control heterogeneous geosensors used in flood managing?

Question

- Q1.1. How to dynamically discover a “sensor”?
- Q1.2. How to access a “sensor” and its metadata using an interoperable communication between sensors and web application?
- Q1.3. Which are the details for sensors implementation that applications should be isolated?
- Q1.4. How to subscribe sensors?

Important Factors

- **Population:** Approaches employed to dynamically manage heterogeneous geosensors.
- **Intervention:** Protocols and Standards to manage heterogeneous sensors.
- **Effect:** Defining a gap related to the question focus, getting to know researches group in this research area, increasing a base knowledge and point to specifics researches that can solve the question.
- **Outcome Measure:** performance, scalability, reusability, interoperability, standizable.
- **Application:** Defense civil, researches of area and resilience communities.

Inclusion Criteria

- Researches that approach techniques to integrate Sensors, UAVs or “Sensor as Humans”;
- Researches that involve a middleware used by web applications or geosensors;
- Researches related to Sensor Web;

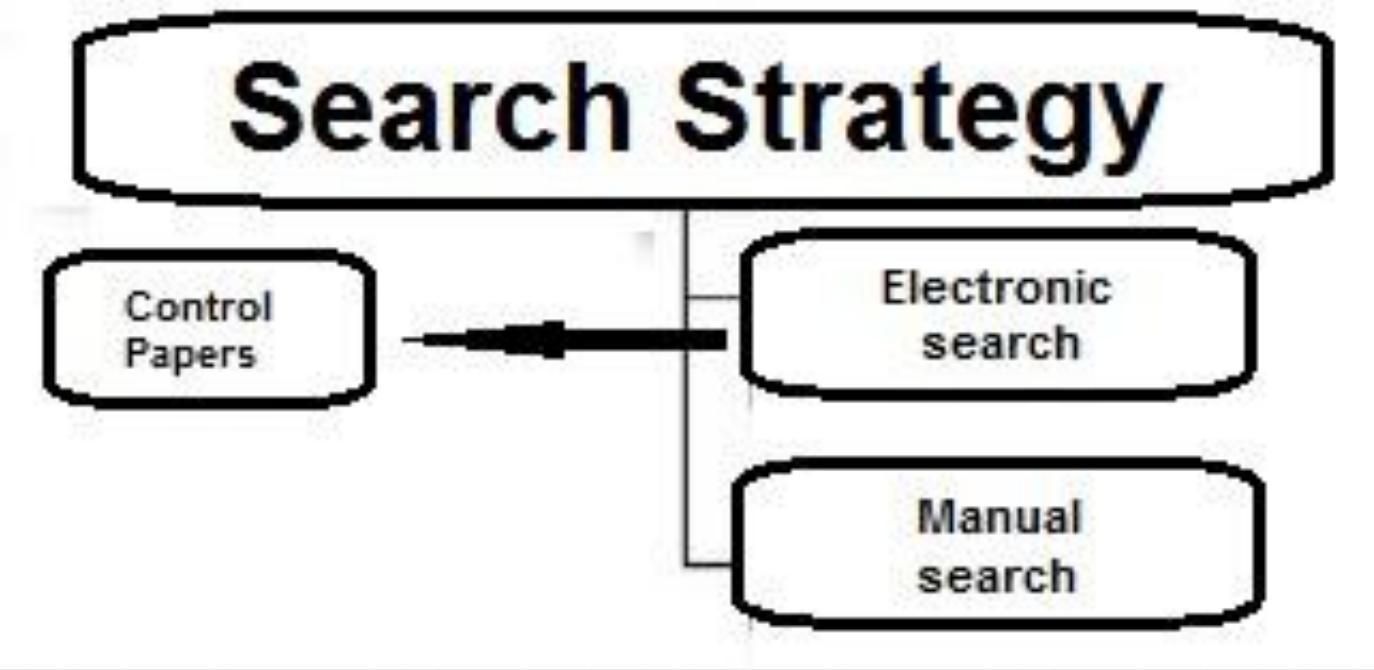
Exclusion Criteria

- Researches that weren't published yet;
- Researches that aren't in English;
- Duplicated Researches;
- Unavailable Researches;
- Quality Researches below than 3 points;
- Researches unrelated to sensors, networks sensors and "Human and Sensors".
- Researches related to hardware components;
- Researches that aren't papers.

Quality Goals

- G1 – Were the goals clear?
- G2 - Was there a context description?
- G3 - Was the documentation proper?
- G4 - Were the results impartial analyzed?
- G5 - Were the results clear?
- G6 - Did add results value to the research area?.

Conduction


Search Strategy
Control Papers
Electronic search
Manual search

Manual Search

Studies Reference
Jirka, S., et al. (2009) Discovery Mechanisms for the Sensor Web. Sensors.
Jirka, S., et al. Applying OGC Sensor Web Enablement to Risk Monitoring and Disaster Management.
Sagl, G., et al. Standardised geo-sensor webs and web-based geo-processing for near real-time situational awareness in emergency management. Int. J. Business Continuity and Risk Management.
Fei Wang & Hongyong Yuan (2010): Challenges of the Sensor Web for disaster management, International Journal of Digital Earth, 3:3, 260-279.

Control Papers

Studies Reference
Broering, A., S. Jirka & T. Foerster (2010): The Sensor Bus - Integrating Geosensors and the Sensor Web. Second Open Source GIS UK Conference - OSGIS 2010. 21.-22. June 2010. Nottingham, UK.
Broering, A., T. Foerster, S. Jirka & Carsten Priess (2010): Sensor Bus: An Intermediary Layer for Linking Geosensor Networks and the Sensor Web. In: Proceedings of COM.Geo 2010, 1st International Conference on Computing for Geospatial Research and Applications, ACM. 21.-30. June 2010. Washington, USA.
Broering, A., S. Jirka & T. Foerster (2010): The Sensor Bus - Integrating Geosensors and the Sensor Web. Second Open Source GIS UK Conference - OSGIS 2010. 21.-22. June 2010. Nottingham, UK.
Broering, A., Maue, P., Janowicz, K., Nuest, D. & Malewski, C. (2011): Semantically-Enabled Sensor Plug & Play for the Sensor Web. Sensors, 11(8), pp. 7568-7605.

Electronic Search

Database	Search String	Recovered
Scopus	TITLE-ABS-KEY((Geosensor OR {Geo-sensor} OR {Heterogeneous Sensor} OR GSN OR {Sensor Web} OR {Web Sensor} OR {Web Sensing}) AND (Middleware OR {Intermediary Layer} OR {Sensor Bus} OR {Plug & Play} OR {Plug and Play} OR PnP))	102
IEEE Xplore	((geosensor OR "geo-sensor" OR "heterogeneous sensor" OR gsn OR "sensor web" OR "web sensor" OR "web sensing") AND (middleware OR "intermediary layer" OR "sensor bus" OR "plug & play" OR "plug and play" OR pnp))	0
ACM Digital Library	(Title:((geosensor or "geo-sensor" or "heterogeneous sensor" or gsn or "sensor web" or "web sensor" or "web sensing") and (middleware or "intermediary layer" or "sensor bus" or "plug & play" or "plug and play" or pnp))) or (Abstract:((geosensor or "geo-sensor" or "heterogeneous sensor" or gsn or "sensor web" or "web sensor" or "web sensing") and (middleware or "intermediary layer" or "sensor bus" or "plug & play" or "plug and play" or pnp))) or (Keywords:((geosensor or "geo-sensor" or "heterogeneous sensor" or gsn or "sensor web" or "web sensor" or "web sensing") and (middleware or "intermediary layer" or "sensor bus" or "plug & play" or "plug and play" or pnp)))	14
Science Direct	TITLE-ABSTR-KEY((geosensor OR {geo-sensor} OR {heterogeneous sensor} OR gsn OR {sensor web} OR {web sensor} OR {web sensing}) AND (middleware OR {intermediary layer} OR {sensor bus} OR {plug & play} OR {plug and play} OR pnp))	3
ISI Web of Science	TI=((geosensor OR "geo-sensor" OR "heterogeneous sensor" OR gsn OR "sensor web" OR "web sensor" OR "web sensing") AND (middleware OR "intermediary layer" OR "sensor bus" OR "plug & play" OR "plug and play" OR pnp)) OR TS=((geosensor OR "geo-sensor" OR "heterogeneous sensor" OR gsn OR "sensor web" OR "web sensor" OR "web sensing") AND (middleware OR "intermediary layer" OR "sensor bus" OR "plug & play" OR "plug and play" OR pnp))	69
Springer	((geosensor OR "geo-sensor" OR "heterogeneous sensor" OR gsn OR "sensor web" OR "web sensor" OR "web sensing") AND (middleware OR "intermediary layer" OR "sensor bus" OR "plug & play" OR "plug and play" OR pnp))	5

First Phase

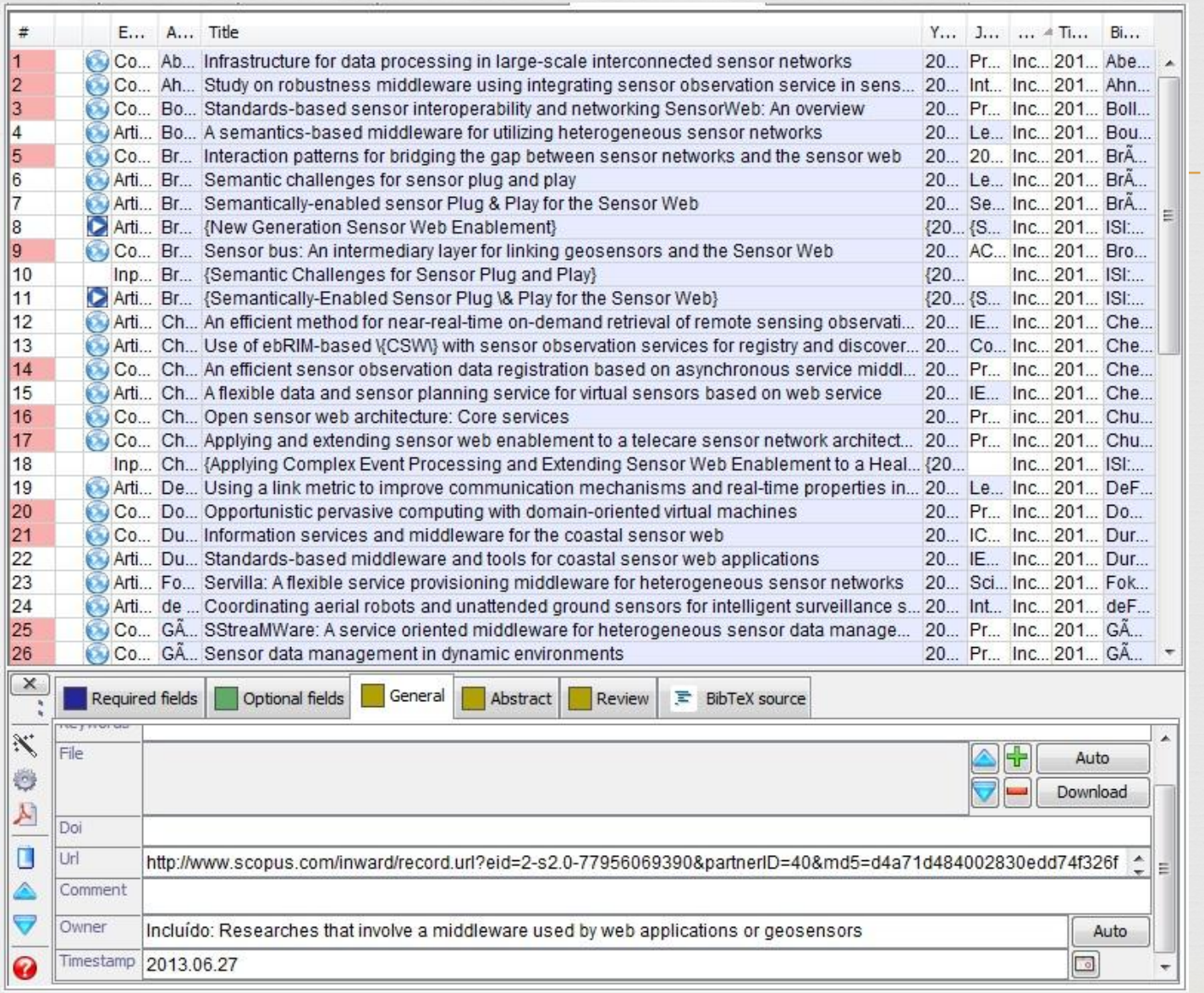
- It was found 193 primary studies
- Some of them were duplicated and unavailable (6 studies).
- It remains 119 studies.

Second Phase

- Each study was analyzed by reading only title, abstract and keywords;

- It remains 52 studies to be read through full-text;

Inclusion List



#	E...	A...	Title	Y...	J...	...	Ti...	Bi...
1	Co...	Ab...	Infrastructure for data processing in large-scale interconnected sensor networks	20...	Pr...	Inc...	201...	Abe...
2	Co...	Ah...	Study on robustness middleware using integrating sensor observation service in sens...	20...	Int...	Inc...	201...	Ahn...
3	Co...	Bo...	Standards-based sensor interoperability and networking SensorWeb: An overview	20...	Pr...	Inc...	201...	Boll...
4	Arti...	Bo...	A semantics-based middleware for utilizing heterogeneous sensor networks	20...	Le...	Inc...	201...	Bou...
5	Co...	Br...	Interaction patterns for bridging the gap between sensor networks and the sensor web	20...	20...	Inc...	201...	BrÃ...
6	Arti...	Br...	Semantic challenges for sensor plug and play	20...	Le...	Inc...	201...	BrÃ...
7	Arti...	Br...	Semantically-enabled sensor Plug & Play for the Sensor Web	20...	Se...	Inc...	201...	BrÃ...
8	Arti...	Br...	{New Generation Sensor Web Enablement}	{20...	{S...	Inc...	201...	ISI:...
9	Co...	Br...	Sensor bus: An intermediary layer for linking geosensors and the Sensor Web	20...	AC...	Inc...	201...	Bro...
10	Inp...	Br...	{Semantic Challenges for Sensor Plug and Play}	{20...		Inc...	201...	ISI:...
11	Arti...	Br...	{Semantically-Enabled Sensor Plug \& Play for the Sensor Web}	{20...	{S...	Inc...	201...	ISI:...
12	Arti...	Ch...	An efficient method for near-real-time on-demand retrieval of remote sensing observati...	20...	IE...	Inc...	201...	Che...
13	Arti...	Ch...	Use of ebRIM-based \{CSW\} with sensor observation services for registry and discover...	20...	Co...	Inc...	201...	Che...
14	Co...	Ch...	An efficient sensor observation data registration based on asynchronous service middl...	20...	Pr...	Inc...	201...	Che...
15	Arti...	Ch...	A flexible data and sensor planning service for virtual sensors based on web service	20...	IE...	Inc...	201...	Che...
16	Co...	Ch...	Open sensor web architecture: Core services	20...	Pr...	inc...	201...	Chu...
17	Co...	Ch...	Applying and extending sensor web enablement to a telecare sensor network architect...	20...	Pr...	Inc...	201...	Chu...
18	Inp...	Ch...	{Applying Complex Event Processing and Extending Sensor Web Enablement to a Heal...	{20...		Inc...	201...	ISI:...
19	Arti...	De...	Using a link metric to improve communication mechanisms and real-time properties in...	20...	Le...	Inc...	201...	DeF...
20	Co...	Do...	Opportunistic pervasive computing with domain-oriented virtual machines	20...	Pr...	Inc...	201...	Do...
21	Co...	Du...	Information services and middleware for the coastal sensor web	20...	IC...	Inc...	201...	Dur...
22	Arti...	Du...	Standards-based middleware and tools for coastal sensor web applications	20...	IE...	Inc...	201...	Dur...
23	Arti...	Fo...	Servilla: A flexible service provisioning middleware for heterogeneous sensor networks	20...	Sci...	Inc...	201...	Fok...
24	Arti...	de ...	Coordinating aerial robots and unattended ground sensors for intelligent surveillance s...	20...	Int...	Inc...	201...	deF...
25	Co...	GÃ...	SStreaMWare: A service oriented middleware for heterogeneous sensor data manage...	20...	Pr...	Inc...	201...	GÃ...
26	Co...	GÃ...	Sensor data management in dynamic environments	20...	Pr...	Inc...	201...	GÃ...

Required fields | Optional fields | General | Abstract | Review | BibTeX source

File

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Url http://www.scopus.com/inward/record.url?eid=2-s2.0-77956069390&partnerID=40&md5=d4a71d484002830edd74f326f

Comment

Owner Incluído: Researches that involve a middleware used by web applications or geosensors

Auto

Timestamp 2013.06.27

Exclusion List

#	E...	Author	Title	Y...	Jo...	...	...	...
1	Arti...	Le-Phuo...	{A middleware framework for scalable management of linked streams}	{20...	{JO...	Ex...	2...	I...
2	Co...	Mechitov...	Building portable middleware services for heterogeneous cyber-physical systems	2012	201...	Ex...	2...	M...
3	Co...	Pereral ...	Capturing sensor data from mobile phones using global sensor network middleware	2012	IEE...	Ex...	2...	P...
4	Co...	Perlepe...	PLATO - Intelligent middleware platform for the collection, analysis, processing of dat...	2012	Pro...	Ex...	2...	P...
5	Arti...	Picone e...	Mobile architecture for dynamic generation and scalable distribution of sensor-based ...	2012	Lect...	Ex...	2...	P...
6	Arti...	Lee et al.	Design and implementation of middleware for greenhouse based on ubiquitous sen...	2010	Lect...	Ex...	2...	L...
7	Co...	Lee et al.	The evolution of the SEMAT sensor network management system	2011	Pro...	Ex...	2...	L...
8	Co...	Le-Trun...	DCM-arch: An architecture for data, control, and management in wireless sensor netw...	2009	Pro...	Ex...	2...	L...
9	Co...	Leuchter...	Personalisation in German smart sensor web	2006	Pro...	Ex...	2...	L...
10	Co...	Liscano ...	Integration of component-based frameworks with sensor modelling languages for the...	2010	201...	Ex...	2...	Li...
11	Co...	Mandl a...	Experimenting with an evolving ground/space-based software architecture to enable s...	2005	Pro...	Ex...	2...	M...
12	Co...	Nam et al.	Data processing mechanism for supporting distributed system of heterogeneous sen...	2010	201...	Ex...	2...	N...
13	Co...	Panang...	A system to provide real-time collaborative situational awareness by Web enabling a ...	2012	GIS:...	Ex...	2...	P...
14	Co...	Park et al.	Design and implementation of home sensor service platform	2010	ICC...	Ex...	2...	P...
15	Co...	Park et al.	Design of home sensor service platform using sensor network middleware	2010	Dig...	Ex...	2...	P...
16	Co...	Perera e...	Connecting mobile things to global sensor network middleware using system-genera...	2012	Mob...	Ex...	2...	P...
17	Arti...	Pignaton...	Multi-agent support in a middleware for mission-driven heterogeneous sensor networ...	2011	Co...	Ex...	2...	P...
18	Co...	TuÃ¡n et ...	Global sensor modeling and constrained application methods enabling cloud-based ...	2012	Pro...	Ex...	2...	T...
19	Co...	Zeeb et al.	Generic sensor network gateway architecture for plug and play data management in s...	2009	ETF...	Ex...	2...	Z...
20	Arti...	Zheng et...	Integration of hydrological observations into a spatial data infrastructure under a sens...	2012	Inte...	Ex...	2...	Z...
21	Co...	Kim et al.	The access control model in ubiquitous sensor network environment	2009	NC...	Ex...	2...	K...
22	Arti...	Kim et al.	{Energy-Efficient Distributed Spatial Join Processing in Wireless Sensor Networks}	{20...	{IEI...	Ex...	2...	I...
23	Co...	Kinnebr...	Intelligent resource management and dynamic adaptation in a distributed real-time a...	2009	Pro...	Ex...	2...	K...
24	Arti...	Koutsou...	OASiS: A service-oriented architecture for ambient-aware sensor networks	2007	Lect...	Ex...	2...	K...
25	Co...	Stirbu	Towards a RESTful plug and play experience in the Web of Things	2008	Pro...	Ex...	2...	S...
26	Arti...	Kim et al.	USN middleware security model	2009	Lect...	Ex...	2...	K...

Required fields | Optional fields | General | Abstract | Review | BibTeX source

Keywords

File

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Comment

Owner: Excluído: Researches unrelated to sensors, networks sensors and "Human and Sensors"

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