

# Research Elaborated

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For a full list of publications please visit <http://kauppinen.net/tomi>. The bibliography file<sup>1</sup> and source file<sup>2</sup> of this document are also available online.

## Publications briefly elaborated (almost all of them)

- **Linked Science—Interconnecting Scientific Assets**<sup>3</sup>
  - See our original article called Linked Open Science [49] and its extension as a book chapter [48].
  - Recently we developed a theoretical model for the **associative nature of conference participation** [88].
  - About applying Linked Science approach see our work on sharing remote sensing data [51]—especially Linked Brazilian Amazon Data [52], and our work on managing scientific findings [5].
  - For making sense of publication data see [spatial@linkedsience](mailto:spatial@linkedsience)<sup>4</sup> [73] and for visually interacting with Linked Spatiotemporal Data with gestures see [7]. Another way to explore linked scientific data is to create analysis and animations on the fly with our ELBAR explorer [80] as a **hypothesis generation step for further spatial data mining**.
  - Our work related work on Linked Universities is reported in a paper about the Linked Open Data University of Muenster (LODUM), see [74] and in papers about Linked Open Aalto, especially using the idea for visual exploration of data [3], for instance to understand interorganizational collaboration [23] via **visual analytics**.
  - Further on, we have used **text mining techniques** to understand and plot spatial aboutness of publications [4]. The idea is to thus to facilitate directing of new research to regions yet unexplored. Linking of scientific assets together, and to space and time should create grounds for Linked Earth, where **all important information about the Earth is interconnected** and can be explored at different levels [47].
- We have studied **Volunteered Geographic Information (VGI)** to understand and advance the role of affordances [85], modeling of provenance [75] [76] [86], spatial data mining to assess classification of VGI features [2] and modeling of trust and reputation [11].
- Related to our VGI efforts we have employed **bayesian networks for crowdsensing and to support situation awareness** [19]. Crowdsensing is interesting also for understanding

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<sup>1</sup><http://kauppinen.net/tomi/publications-tomi-kauppinen.bib>

<sup>2</sup><http://kauppinen.net/tomi/publications-tomi-kauppinen-elaborated.tex>

<sup>3</sup><http://linkedsience.org>

<sup>4</sup><http://linkedsience.org/spatial>

local phenomena. For this we have created a platform for **gathering and visualizing user experiences about spaces** (indoor such as office buildings) via mobile and web interfaces [62]. With these we have argued that human computation is essential for understanding phenomena and supporting to improve cities. In order to prepare grounds for this we have conducted a **survey of people movement analytics studies** in the context of smart cities [78].

- The vision for **Geographic Information Observatories** was outlined in [39]. Related to this, we have studied the role of contextual information [40] as lenses to observe the data universe.
- Our work on making **higher level conceptualizations** from raw data is documented in papers about modeling geosensor observations [13] [14]. Similar task has been in our work on creating a usable information layer about the deforestation in the Brazilian Amazon see [50] [12], and particularly about using Linked Data technologies to share remote sensing observation data [51]. A related work is the methodology for crowdsourcing Linked Spatiotemporal Data after an earthquake and interacting with it with an user interface see [81] [45].
- Our studies have argued that **Linked Data** introduces a paradigm shift for **Geographic Information Science** [77] and that it thus is a core component of the Future Spatial Data Infrastructure [15]
- **Digital Cultural Heritage** has been one of the main themes, especially during my PhD dissertation [43]. This has led to new methods for using Fuzzy Sets to model imprecise temporal periods [64] according to how users cognitively rank the relevances. Another related research direction has been to reason about changes [65]. One practical result has been SMARTMUSEUM [70, 8, 83, 82] which matches user profiles with the available semantic annotations thus bridging the cognitive gap between humans and machines. In our studies we did data mining to analyze annotation co-occurrences [61] and spatial data mining for finding out interesting relations between places [68]
- The core result of my PhD [43] was **The Finnish Spatiotemporal Ontology (SAPO)**:
  - First mention about SAPO was made in [57]
  - SAPO was built using different methods and components. These include
    - \* reasoning about changes (such as merges and splits) in administrative regions [60] [59] [58], and
    - \* a vocabulary for collecting changes supported by a method for creating the temporal parts of regions [72].
  - The benefits of using SAPO is shown via application examples for
    - \* managing digital cultural heritage content [65],
    - \* for query expansion [91], and
    - \* for semantic autocompletion [87].
  - An evaluation in an information retrieval task shows [65] that by using SAPO the recall increases considerably without loss in precision.

- A book chapter gives an overview of the research related to SAPO [33].
- We have also used ontologies to integrate health information with geoinformation [89] [18]
- Back in my PhD period I worked on The Finnish Geo-ontology (SUO) [22] [55] [56] and particularly on using geospatial ontologies in CultureSampo [65] [53] [27] [28] [27] [29] [30] [31] [32] and on developing spatiotemporal ontologies and services [55] [26] in the FinnONTO project [36] [84] [35] [34] [79] [90].
- I have also edited proceedings in the above fields, these include TSTIP2015 [1, 10], SAFE2015 [9], JOINT SSA-SMILE 2014 [16], VISUAL2014 [37], LISC 2011 [66], LISC 2012 [67], LISC 2013 [17], LISC 2014 [93], Geographic Information Observatories 2014 [38], GIScience in the Big Data Age 2012 [41], Developments in Artificial Intelligence [24], Web Intelligence [25] and XML Finland [20]
- Further on, as an application of my research I have published vocabulary specifications online. These vocabularies are CHANGE [44], TEACH [71], EXPERIENCE [63], LSC [6] and TISC [46].
- Finally, I have written papers also in Finnish, for instance about the Finnish Spatiotemporal Ontology SAPO [92], Geospatial Ontologies [21], Sensor Web [54], Semantic Web [69] and Pattern Recognition [42].

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## References

- [1] *Proceedings of the Workshop on Teaching Spatial Thinking from Interdisciplinary Perspectives co-located with Conference on Spatial Information Theory XII (COSIT 2015)*, 2016.
- [2] Ahmed Loai Ali, Falko Schmid, Rami Al-Salman, and Tomi Kauppinen. Ambiguity and plausibility: Managing classification quality in Volunteered Geographic Information. In *Proceedings of the ACM SIGSPATIAL GIS 2014*, Dallas, Texas, USA, November 7–11 2014.
- [3] Miika Alonen, Tomi Kauppinen, Osma Suominen, and Eero Hyvönen. Exploring the linked university data with visualization tools. In Philipp Cimiano, Miriam Fernández, Vanessa Lopez, Stefan Schlobach, and Johanna Völker, editors, *The Semantic Web: ESWC 2013 Satellite Events*, volume 7955, pages 204–208, Montpellier, France, 2013. Springer Berlin Heidelberg.
- [4] Iana Atanassova, Marc Bertin, and Tomi Kauppinen. Exploitation de données spatiales provenant d’articles scientifiques pour le suivi des maladies tropicales. In *Gestion et Analyse des données Spatiales et Temporelles (GAST’2015@EGC2015)*, 15ème conférence internationale sur l’extraction et la gestion des connaissances (EGC2015), Luxembourg, January 2015.
- [5] Alkyoni Baglatzi and Tomi Kauppinen. Managing and representing scientific findings about the environment. In *Demos and Posters of the 18th International Conference on Knowledge Engineering and Knowledge Management (EKAW2012)*, National University of Ireland, Galway, Ireland, October 2012.

- [6] Alkyoni Baglatzi, Tomi Kauppinen, and Carsten Keßler. Linked science core vocabulary specification. Technical report, LinkedScience.org, 2011.
- [7] Thomas Bartoschek, Gerald Paper, Christian Kray, Jim Jones, and Tomi Kauppinen. Gestural interaction with spatiotemporal linked open data. *OSGEO Journal*, (11), 2013.
- [8] Marco Berni, Nima Dokoochaki, Elena Fani, Eero Hyvönen, Tomi Kauppinen, Mihhail Matskin, Eetu Mäkelä, and Tuukka Ruotsalo. Smartmuseum: a cultural heritage knowledge exchange platform based on ontology-oriented, context-aware and profiling systems. In *Proceedings of Electronic Imaging & the Visual Arts (EVA 2009)*, Florence, Italy, April 28–30 2009.
- [9] Eva Blomqvist, Vitaveska Lanfranchi, Suvodeep Mazumdar, Tomi Kauppinen, and Carsten Kessler. Workshop summary: Workshop on semantics and analytics for emergency response (safe2015). In L. Palen, M. Buscher, T. Comes, and A. Hughes, editors, *Proceedings of The 12th International Conference on Information Systems for Crisis Response and Management*, Kristiansand, Norway, May 24–27 2015.
- [10] Heather Burte, Tomi Kauppinen, and Mary Hegarty. Teaching spatial thinking from interdisciplinary perspective workshop (introduction). In *Proceedings of the Workshop on Teaching Spatial Thinking from Interdisciplinary Perspectives co-located with Conference on Spatial Information Theory XII (COSIT 2015)*, Santa Fe, New Mexico, USA, 2016.
- [11] Fausto D’Antonio, Paolo Fogliaroni, and Tomi Kauppinen. VGI Edit History Reveals Data Trustworthiness and User Reputation. In *Proceedings of the 17th AGILE Conference on Geographic Information Science, Connecting a Digital Europe through Location and Place*, Castellon, Spain, June 2014. to appear, in press.
- [12] Giovana Mira de Espindola and Tomi Kauppinen. Semantic linking of data for the Brazilian Amazon Rainforest statistics. In *GeoChange 2010—GIScience for Environmental Change*, Campos do Jordão, São Paulo, Brazil, November 2010.
- [13] Anusuriya Devaraju and Tomi Kauppinen. Geo-processes and properties observed by sensors. In *GeoChange 2010—GIScience for Environmental Change*, Campos do Jordão, São Paulo, Brazil, November 2010.
- [14] Anusuriya Devaraju and Tomi Kauppinen. Sensors tell more than they sense: Modeling and reasoning about sensor observations for understanding weather events. *Special Issue on Semantic Sensor Networks, International Journal of Sensors, Wireless Communications and Control*, 2(1), 2012.
- [15] Laura Diaz, Albert Remke, Tomi Kauppinen, Auriol Degbelo, Theodor Foerster, Christoph Stasch, Matthes Rieke, Bastian Schaeffer, Bastian Baranski, Arne Broering, and Andreas Wytzisk. Future sdi—impulses from geoinformatics research and it trends. *International Journal of Spatial Data Infrastructures Research (IJS DIR)*, 7:378–410, 2012.
- [16] Aldo Gangemi, Harith Alani, Malvina Nissim, Erik Cambria, Diego Reforgiato Recupero, Vitaveska Lanfranchi, and Tomi Kauppinen, editors. *Joint Proceedings of the 11th Workshop on Semantic Sentiment Analysis (SSA2014), and the Workshop on Social Media and Linked Data*

for Emergency Response (SMILE 2014) co-located with 11th European Semantic Web Conference (ESWC 2014), January 2015.

- [17] Paul Groth, Marieke van Erp, Tomi Kauppinen, Jun Zhao, Carsten Kessler, Line C. Pouchard, Carole Goble, Yolanda Gil, and Jacco van Ossenbruggen, editors. *Proceedings of the 3rd International Workshop on Linked Science 2013—Supporting Reproducibility, Scientific Investigations and Experiments (LISC)*, volume Vol-1116, Sydney Australia, October 2013. CEUR Workshop Proceedings.
- [18] Nurefşan Gür, Laura Díaz, and Tomi Kauppinen. Gi systems for public health with an ontology based approach. In *Proceedings of the 15th AGILE International Conference on Geographic Information Science (AGILE2012)*, Avignon, France, April 2012.
- [19] Peter Haddawy, Lutz Frommberger, Tomi Kauppinen, Giorgio De Felice, Prae Charkratpahu, Sirawaratt Saengpao, and Phanumas Kanchanakitsakul. Situation awareness in crowdsensing for disease surveillance in crisis situations. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development (ICTD 2015) (To Appear)*, Nanyang Technological University, Singapore, May 2015. ACM.
- [20] Anneli Heimbürger, Tomi Kauppinen, Harri Lehtinen, Jari Multisilta, Matti Paaajanen, and Kimmo Rytönen, editors. *XML - The Enabling Technology for Integrating Business Processes*, number 2, Pori, Finland, March 8–9 2005. Tampere University of Technology.
- [21] Riikka Henriksson and Tomi Kauppinen. Ontologioilla paikkatietojen sisältö hallintaan, 2007.
- [22] Riikka Henriksson, Tomi Kauppinen, and Eero Hyvönen. Core geographical concepts: Case finnish geo-ontology. Location and the Web (LocWeb) 2008 workshop, 17th International World Wide Web Conference WWW 2008, ACM International Conference Proceeding Series; Vol. 300, Pages 57-60, Beijing, China, April 21-25 2008.
- [23] Salli Hukkinen and Tomi Kauppinen. Supporting visual exploration of inter-organization collaboration. In *Proceedings of Workshop on Human-Semantic Web Interaction (HSWI14)*, Anisaras, Crete, Greece, May 2014.
- [24] Eero Hyvönen, Tomi Kauppinen, Jukka Kortela, Mikko Laukkanen, Tapani Raiko, and Kim Viljanen, editors. *Developments in Artificial Intelligence and the Semantic Web - Proceedings of the 12th Finnish AI Conference STeP 2006*. Finnish AI Society, Finland, October 26-27 2006.
- [25] Eero Hyvönen, Tomi Kauppinen, Mirva Salminen, Kim Viljanen, and Pekka Ala-Siuru, editors. *Web Intelligence—Proceedings of the 11th Finnish AI Conference*, September 1-3 2004.
- [26] Eero Hyvönen, Robin Lindroos, Tomi Kauppinen, and Riikka Henriksson. An ontology service for geographical content. In *Poster Proceedings of the International Semantic Web Conference (ISWC 2007)*, Busan, Korea, Nov 2007.
- [27] Eero Hyvönen, Eetu Mäkelä, Tomi Kauppinen, Olli Alm, Jussi Kurki, Tuukka Ruotsalo, Katri Seppälä, Joeli Takala, Kimmo Puputti, Heini Kuittinen, Kim Viljanen, Jouni Tuominen, Tuomas Palonen, Matias Frosterus, Reetta Sinkkilä, Panu Paakkarinen, Joonas Laitio, and

- Katariina Nyberg. Culturesampo – finnish cultural heritage collections on the semantic web 2.0. In *Proceedings of the 1st International Symposium on Digital Humanities for Japanese Arts and Cultures (DH-JAC-2009)*, Ritsumeikan University, Kyoto, Japan, March 2009.
- [28] Eero Hyvönen, Eetu Mäkelä, Tomi Kauppinen, Olli Alm, Jussi Kurki, Tuukka Ruotsalo, Katri Seppälä, Joeli Takala, Kimmo Puputti, Heini Kuittinen, Kim Viljanen, Jouni Tuominen, Tuomas Palonen, Matias Frosterus, Reetta Sinkkilä, Panu Paakkarinen, Joonas Laitio, and Katariina Nyberg. CultureSampo – Finnish culture on the semantic web 2.0. thematic perspectives for the end-user. In *Proceedings, Museums and the Web 2009, Indianapolis, USA*, April 15-18 2009.
- [29] Eero Hyvönen, Eetu Mäkelä, Tomi Kauppinen, Olli Alm, Jussi Kurki, Tuukka Ruotsalo, Katri Seppälä, Joeli Takala, Kimmo Puputti, Heini Kuittinen, Kim Viljanen, Jouni Tuominen, Tuomas Palonen, Matias Frosterus, Reetta Sinkkilä, Panu Paakkarinen, Joonas Laitio, and Katariina Nyberg. Culturesampo – a collective memory of finnish cultural heritage on the semantic web 2.0. Technical report, Helsinki University of Technology and University of Helsinki, Sept 29 2008.
- [30] Eero Hyvönen, Eetu Mäkelä, Tuukka Ruotsalo, Tomi Kauppinen, Olli Alm, Jussi Kurki, Joeli Takala, Kimmo Puputti, and Heini Kuittinen. Culturesampo–finnish culture on the semantic web. In *Posters of the 5th European Semantic Web Conference 2008 (ESWC 2008)*, Tenerife, Spain, June 1-5 2008.
- [31] Eero Hyvönen, Tuukka Ruotsalo, Thomas Haggström, Mirva Salminen, Miikka Junnila, Mikko Virkkilä, Mikko Haaramo, Eetu Mäkelä, Tomi Kauppinen, and Kim Viljanen. Culturesampo - finnish culture on the semantic web: The vision and first results. In *Proceedings of the 12th Finnish Artificial Intelligence Conference STEP 2006*, Espoo, Finland, October 26–27 2006.
- [32] Eero Hyvönen, Tuukka Ruotsalo, Thomas Haggström, Mirva Salminen, Miikka Junnila, Mikko Virkkilä, Mikko Haaramo, Eetu Mäkelä, Tomi Kauppinen, and Kim Viljanen. *CultureSampo–Finnish Culture on the Semantic Web: The Vision and First Results*, pages 33–58. LIT Verlag, Berlin, November 2007.
- [33] Eero Hyvönen, Jouni Tuominen, Tomi Kauppinen, and Jari Väätäinen. *Representing and Utilizing Changing Historical Places as an Ontology Timeseries*, chapter Geospatial Semantics and Semantic-Web: Foundations, Algorithms, Applications. Springer book series, Semantic Web and Beyond: Computing for Human Experience. Springer, 2011.
- [34] Eero Hyvönen, Arttu Valo, Ville Komulainen, Katri Seppälä, Tomi Kauppinen, Tuukka Ruotsalo, Mirva Salminen, and Anu Ylisalmi. Finnish national ontologies for the semantic web - towards a content and service infrastructure. In *Proceedings of International Conference on Dublin Core and Metadata Applications (DC 2005)*, Nov 2005.
- [35] Eero Hyvönen, Arttu Valo, Katri Seppälä, Tomi Kauppinen, Ville Komulainen, Tuukka Ruotsalo, Mirva Salminen, and Anu Ylisalmi. Creating a national content and service infrastructure for the semantic web. In *Poster paper, 4th International Semantic Web Conference*, November 2005.

- [36] Eero Hyvönen, Kim Viljanen, Eetu Mäkelä, Tomi Kauppinen, Tuukka Ruotsalo, Onni Valkeapää, Katri Seppälä, Osma Suominen, Olli Alm, Robin Lindroos, Teppo Käsälä, Rikikka Henriksson, Matias Frosterus, Jouni Tuominen, Reetta Sinkkilä, and Jussi Kurki. Elements of a national semantic web infrastructure - case study finland on the semantic web (invited paper). In *Proceedings of the First International Semantic Computing Conference (IEEE ICSC 2007), Irvine, California, September 2007*. IEEE Press.
- [37] Valentina Ivanova, Tomi Kauppinen, Steffen Lohmann, Suvodeep Mazumdar, Catia Pesquita, and Kai Xu, editors. *Proceedings of the International Workshop on Visualizations and User Interfaces for Knowledge Engineering and Linked Data Analytics co-located with 19th International Conference on Knowledge Engineering and Knowledge Management (EKAW 2014)*, volume 1299, Linköping, Sweden, November 24 2014. CEUR Workshop Proceedings.
- [38] Krzysztof Janowicz, Benjamin Adams, Grant McKenzie, and Tomi Kauppinen, editors. *Proceedings of the Workshop on Geographic Information Observatories 2014*. CEUR, September 2014.
- [39] Krzysztof Janowicz, Benjamin Adams, Grant McKenzie, and Tomi Kauppinen. Towards geographic information observatories. In *Proceedings of the Workshop on Geographic Information Observatories 2014*. CEUR, September 2014.
- [40] Krzysztof Janowicz, Tomi Kauppinen, Sven Schade, Andrea Ballatore, and Grant McKenzie. Contextual information: Lenses for observing the data universe. In *Proceedings of the Workshop on Geographic Information Observatories 2015, collocated with the Conference On Spatial Information Theory (COSIT) 2015, Santa Fe, New Mexico, USA, 2015*.
- [41] Krzysztof Janowicz, Carsten Keßler, Tomi Kauppinen, Dave Kolas, and Simon Scheider, editors. *Proceedings of the Workshop on GIScience in the Big Data Age, In conjunction with the seventh International Conference on Geographic Information Science 2012 (GIScience 2012)*, Columbus, Ohio, USA, September 2012.
- [42] Tomi Kauppinen. Hahmojen etsintä rakenteisesta biomolekyyliaineistosta. In Hannu Toivonen, editor, *Tiedon louhinta biomolekyyliaineistosta*, TKTL C-2003-52, Helsinki, Finland, 2003. Helsingin yliopisto.
- [43] Tomi Kauppinen. *Methods for Creating and Using Geospatio-temporal Semantic Web*. PhD thesis, Aalto University, School of Science and Technology, Espoo, April 2010.
- [44] Tomi Kauppinen. Change vocabulary specification. Technical report, LinkedEarth.org, 2012.
- [45] Tomi Kauppinen. Linking and visualizing social media data about crises. In Vitaveska Lanfranchi, Suvodeep Mazumdar, Eva Blomqvist, and Christopher Brewster, editors, *Proceedings of the Workshop on Social Media and Linked Data for Emergency Response (SMILE2013) co-located with 10th Extended Semantic Web Conference (ESWC 2013)*, volume Vol-1191, Montpellier, France, May 26 2013. CEUR.
- [46] Tomi Kauppinen. Open time and space core vocabulary specification. Technical report, Observedchange.com, 2013.

- [47] Tomi Kauppinen. Linked earth: Supporting understanding of the phenomena that shape the earth. In *Proceedings of the Big Data from Space conference (BiDS'14)*. European Space Agency (ESA), November 2014.
- [48] Tomi Kauppinen, Alkyoni Baglatzi, and Carsten Kefßler. *Linked Science: Interconnecting Scientific Assets*. CRC Press, USA, 2013.
- [49] Tomi Kauppinen and Giovana Mira de Espindola. Linked open science-communicating, sharing and evaluating data, methods and results for executable papers. *Procedia Computer Science*, 4(0):726–731, 2011. Proceedings of the International Conference on Computational Science, ICCS 2011.
- [50] Tomi Kauppinen and Giovana Mira de Espindola. Ontology-based modeling of land change trajectories in the Brazilian Amazon. In *Geoinformatik 2011—GeoChange*, Münster, Germany,, June 2011.
- [51] Tomi Kauppinen, Giovana Mira de Espindola, and Benedikt Gräler. Sharing and analyzing remote sensing observation data for Linked Science. In *Poster proceedings of the Extended Semantic Web Conference 2012 (ESWC2012)*, Heraklion, Crete, Greece, May 2012.
- [52] Tomi Kauppinen, Giovana Mira de Espindola, Jim Jones, Alber Sanchez, Benedikt Gräler, and Thomas Bartoschek. Linked Brazilian Amazon Rainforest Data. *Semantic Web Journal*, 5(2), 2014.
- [53] Tomi Kauppinen, Christine Deichstetter, and Eero Hyvönen. Temp-o-map: Ontology-based search and visualization of spatio-temporal maps. In *Demo track at the European Semantic Web Conference ESWC 2007, Innsbruck, Austria*. Springer, June 4-5 2007.
- [54] Tomi Kauppinen and Anusuriya Devaraju. Älyä havaintojen yhdistämiseen, 2013.
- [55] Tomi Kauppinen, Riikka Henriksson, Reetta Sinkkilä, Robin Lindroos, Jari Väättäin, and Eero Hyvönen. Ontology-based disambiguation of spatiotemporal locations. In *Proceedings of the 1st international workshop on Identity and Reference on the Semantic Web (IRSW2008), 5th European Semantic Web Conference 2008 (ESWC 2008)*, Tenerife, Spain, June 1-5 2008. CEUR Workshop Proceedings, ISSN 1613-0073.
- [56] Tomi Kauppinen, Riikka Henriksson, Jari Väättäin, Christine Deichstetter, and Eero Hyvönen. Ontology-based modeling and visualization of cultural spatio-temporal knowledge. In *Developments in Artificial Intelligence and the Semantic Web - Proceedings of the 12th Finnish AI Conference STeP 2006*, October 26-27 2006.
- [57] Tomi Kauppinen and Eero Hyvönen. Bridging the semantic gap between ontology versions. In *Proceedings of the 11th Finnish AI Conference, Web Intelligence Symposium*, volume 2 of *Conference Series – No 20*, pages 63–72. Finnish Artificial Intelligence Society, September 1–3 2004.
- [58] Tomi Kauppinen and Eero Hyvönen. Geospatial reasoning over ontology changes in time. In Hans W. Guesgen, editor, *IJCAI-05 Workshop on Spatial and Temporal Reasoning – Working Notes*, pages 7–15, Edinburgh, Scotland, July 30 – August 5 2005. Nineteenth International Joint Conference on Artificial Intelligence IJCAI-05.



- [59] Tomi Kauppinen and Eero Hyvönen. Modeling coverage between geospatial resources. In *Posters and Demos at the 2nd European Semantic Web Conference ESWC2005*, pages 49–50, May 29–June 1 2005. (Best Poster Award ESWC 2005).
- [60] Tomi Kauppinen and Eero Hyvönen. *Modeling and Reasoning about Changes in Ontology Time Series*, pages 319–338. Integrated Series in Information Systems. Springer-Verlag, New York (NY), New York, NY, January 15 2007.
- [61] Tomi Kauppinen, Heini Kuittinen, Jouni Tuominen, Katri Seppälä, and Eero Hyvönen. Extending an ontology by analyzing annotation co-occurrences in a semantic cultural heritage portal. In *Proceedings of the ASWC 2008 Workshop on Collective Intelligence (ASWC-CI 2008) organized as a part of the 3rd Asian Semantic Web Conference (ASWC 2008), Bangkok, Thailand, February 2-5 2009*.
- [62] Tomi Kauppinen, Evgenia Litvinova, and Jan Kallenbach. Capturing and linking human sensor observations with YouSense. In *Proceedings of the ISWC 2014 Posters and Demonstrations Track, a track within the 13th International Semantic Web Conference (ISWC 2014)*, Riva del Garda, Trentino, Italy, October 2014.
- [63] Tomi Kauppinen, Evgenia Litvinova, and Jan Kallenbach. Experience vocabulary specification. Technical report, LinkedEarth.org, 2014.
- [64] Tomi Kauppinen, Glauco Mantegari, Panu Paakkarinen, Heini Kuittinen, Eero Hyvönen, and Stefania Bandini. Determining relevance of imprecise temporal intervals for cultural heritage information retrieval. *International Journal of Human-Computer Studies*, 68(9):549–560, September 2010.
- [65] Tomi Kauppinen, Panu Paakkarinen, Eetu Mäkelä, Heini Kuittinen, Jari Väättäin, and Eero Hyvönen. *Geospatio-temporal Semantic Web for Cultural Heritage*, chapter 4, pages 48–64. 2010.
- [66] Tomi Kauppinen, Line C. Pouchard, and Carsten Keßler, editors. *Proceedings of the First International Workshop on Linked Science 2011 (LISC2011)*, volume 783 of *CEUR Workshop Proceedings*, Bonn, Germany, October 24 2011. Available at [ceur-ws.org/Vol-783](http://ceur-ws.org/Vol-783).
- [67] Tomi Kauppinen, Line C. Pouchard, and Carsten Kessler, editors. *Proceedings of the Second International Workshop on Linked Science 2012 (LISC2012)*, volume 951 of *CEUR Workshop Proceedings*, Boston, MA, USA, November 2012. CEUR Workshop Proceedings, Vol 951, <http://ceur-ws.org>, ISSN 1613-0073.
- [68] Tomi Kauppinen, Kimmo Puputti, Panu Paakkarinen, Heini Kuittinen, Jari Väättäin, and Eero Hyvönen. Learning and visualizing cultural heritage connections between places on the semantic web. In *Proceedings of the Workshop on Inductive Reasoning and Machine Learning on the Semantic Web (IRMLeS2009), The 6th Annual European Semantic Web Conference (ESWC2009)*, May 31 - June 4 2009.
- [69] Tomi Kauppinen, Tuukka Ruotsalo, and Mirva Salminen. Tiedon mallintaminen semanttisessa webissä, Dec 2005.

- [70] Tomi Kauppinen, Tuukka Ruotsalo, Frédéric Weis, Sylvain Roche, Marco Berni, Nima Dokoochaki, and Eero Hyvönen. Smartmuseum: Knowledge exchange platform for cross-european cultural content integration and mobile publication. In *Proceedings of the 2nd Conference of Cultural Heritage on line—Empowering users: an active role for user communities*, Florence, Italy, December 15–16 2009. Fondazione Rinascimento Digitale, Ministero per i Beni e le Attività Culturali and The Library of Congress.
- [71] Tomi Kauppinen, Johannes Trame, and Andres Westermann. Teaching core vocabulary specification (TEACH). Technical report, LinkedScience.org, Technical Report, 2012.
- [72] Tomi Kauppinen, Jari Väättäinen, and Eero Hyvönen. Creating and using geospatial ontology time series in a semantic cultural heritage portal. In *S. Bechhofer et al.(Eds.): Proceedings of the 5th European Semantic Web Conference 2008 ESWC 2008, LNCS 5021, Tenerife, Spain*, pages 110–123. Springer-Verlag, June 1-5 2008.
- [73] Carsten Keßler, Krzysztof Janowicz, and Tomi Kauppinen. spatial@linkedscience—Exploring Research Field of GIScience with Linked Data. In N. Xiao, M.-P. Kwan, M.F. Goodchild, and S. Shekhar, editors, *Proceedings of the Seventh International Conference on Geographic Information Science (GIScience2012)*, Columbus, Ohio, USA, 2012. Springer.
- [74] Carsten Keßler and Tomi Kauppinen. Linked open data university of muenster—infrastructure and applications. In *Demos the Extended Semantic Web Conference 2012 (ESWC2012)*, Heraklion, Crete, Greece, May 2012.
- [75] Carsten Keßler, Johannes Trame, and Tomi Kauppinen. Provenance and trust in volunteered geographic information: The case of openstreetmap. In *Conference on Spatial Information Theory: COSIT'11*, Belfast, Maine, USA, September 2011.
- [76] Carsten Keßler, Johannes Trame, and Tomi Kauppinen. Tracking editing processes in volunteered geographic information: The case of openstreetmap. In *proceedings of Workshop on Identifying Objects, Processes and Events in Spatio-Temporally Distributed Data (IOPE 2011), Conference on Spatial Information Theory: COSIT'11*, Belfast, Maine, USA, September 2011.
- [77] Werner Kuhn, Tomi Kauppinen, and Krzysztof Janowicz. Linked Data – a paradigm shift for Geographic Information Science. In *Proceedings of The Eighth International Conference on Geographic Information Science (GIScience2014)*, Vienna University of Technology, Austria, September 2014. to appear.
- [78] Elena Simona Lohan, Tomi Kauppinen, and Sree Bash Chandra Debnath. A survey of people movement analytics studies in the context of smart cities. In *Proceedings of 19th FRUCT Conference (in press)*, Jyväskylä, Finland, November 7-11 2016.
- [79] Eetu Mäkelä, Kim Viljanen, Olli Alm, Jouni Tuominen, Onni Valkeapää, Tomi Kauppinen, Jussi Kurki, Reetta Sinkkilä, Teppo Käsälä, Robin Lindroos, Osma Suominen, Tuukka Ruotsalo, and Eero Hyvönen. Enabling the semantic web with ready-to-use web widgets. In *Proceedings of the First Industrial Results of Semantic Technologies Workshop, ISWC2007*, November 11 2007.

- [80] Suvodeep Mazumdar and Tomi Kauppinen. Visualizing and animating large-scale spatiotemporal data with ELBAR explorer. In *Proceedings of the ISWC 2014 Posters and Demonstrations Track, a track within the 13th International Semantic Web Conference (ISWC 2014)*, Riva del Garda, Trentino, Italy, October 2014.
- [81] Jens Ortmann, Minu Limbu, Dong Wang, and Tomi Kauppinen. Crowdsourcing Linked Open Data for Disaster Management. In Rolf Grütter, Dave Kolas, Manolis Koubarakis, and Dieter Pfoser, editors, *Proceedings of the Terra Cognita Workshop on Foundations, Technologies and Applications of the Geospatial Web, In conjunction with the International Semantic Web Conference (ISWC2011)*, volume 798, pages 11–22, Bonn, Germany, October 2011. CEUR Workshop Proceedings.
- [82] Tuukka Ruotsalo, Krister Haav, Antony Stoyanov, Sylvain Roche, Elena Fanid, Romina Delia, Eetu Mäkelä, Tomi Kauppinen, and Eero Hyvönen. SMARTMUSEUM: A Mobile Recommender System for the Web of Data. *Web Semantics: Science, Services and Agents on the World Wide Web*, 20:50–67, May 2013.
- [83] Tuukka Ruotsalo, Eetu Mäkelä, Tomi Kauppinen, Eero Hyvönen, Krister Haav, Ville Rantala, Matias Frosterus, Nima Dokoochaki, and Mihhail Matskin. Smartmuseum: Personalized context-aware access to digital cultural heritage. In *Proceedings of the International Conferences on Digital Libraries and the Semantic Web 2009 (ICSD2009)*, Trento, Italy, September 2009. Trento, Italy.
- [84] Tuukka Ruotsalo, Katri Seppälä, Kim Viljanen, Eetu Mäkelä, Jussi Kurki, Olli Alm, Tomi Kauppinen, Jouni Tuominen, Matias Frosterus, Reetta Sinkkilä, and Eero Hyvönen. Ontology-based approach for interoperability of digital collections. *Signum*, (5), 2008.
- [85] Simon Scheider, Carsten Keßler, Jens Ortmann, Anusuriya Devaraju, Johannes Trame, Tomi Kauppinen, and Werner Kuhn. *Semantic Referencing of Geosensor Data and Volunteered Geographic Information*, chapter Geospatial Semantics and Semantic-Web: Foundations, Algorithms, Applications. Springer book series, Semantic Web and Beyond: Computing for Human Experience. Springer, 2011.
- [86] Falko Schmid, Oliver Kutz, Lutz Frommberger, Till Mossakowski, Tomi Kauppinen, and Cunyuan Cai. Intuitive and natural interfaces for geospatial data classification. In *Proceedings of Place-Related Knowledge Acquisition Research (P-KAR) Workshop*, Kloster Seeon, Germany, August 2012.
- [87] Reetta Sinkkilä, Eetu Mäkelä, Tomi Kauppinen, and Eero Hyvönen. Combining context navigation with semantic autocompletion to solve problems in concept selection. In Khalid Belhajjame, Mathieu d’Aquin, Peter Haase, and Paolo Missier, editors, *First International Workshop on Semantic Metadata Management and Applications, SeMMA 2008, Located at the Fifth European Semantic Web Conference (ESWC 2008), Tenerife, Spain, June 2nd, 2008. Proceedings*, volume 346 of *CEUR Workshop Proceedings*, pages 61–68. CEUR-WS.org, June 1-5 2008. <http://ceur-ws.org/Vol-346/5.pdf>.
- [88] Jelena Smiljanić, Arnab Chatterjee, Tomi Kauppinen, and Marija Mitrović Dankulov. A theoretical model for the associative nature of conference participation. *PLoS ONE*, 11(2):e0148528, 02 2016.

- [89] Binyam Tilahun, Tomi Kauppinen, Carsten Keßler, and Fleur Fritz. Design and development of a linked open data-based health information representation and visualization system: Potentials and preliminary evaluation. *JMIR Med Inform*, 2(2):e31, Oct 2014.
- [90] Jouni Tuominen, Tomi Kauppinen, Kim Viljanen, and Eero Hyvönen. Ajax widget for semantic query expansion. In *Proceedings of 5th Workshop on Scripting and Development for the Semantic Web (SFSW2009)*, CEUR Workshop proceedings Vol. 449, Heraklion, Crete, Greece, May 31–June 4 2009. CEUR.
- [91] Jouni Tuominen, Tomi Kauppinen, Kim Viljanen, and Eero Hyvönen. Ontology-based query expansion widget for information retrieval. In *Proceedings of the 5th Workshop on Scripting and Development for the Semantic Web (SFSW 2009)*, 6th European Semantic Web Conference (ESWC 2009). CEUR Workshop Proceedings, <http://ceur-ws.org/>, May 31 - June 4 2009.
- [92] Jari Väätäinen and Tomi Kauppinen. Sapon nykytila, ylläpito ja laajennusmahdollisuudet. Technical report, Kansalliskirjasto, 2015.
- [93] Jun Zhao, Marieke van Erp, Carsten Kessler, Tomi Kauppinen, Jacco van Ossenbruggen, and Willem Robert van Hage, editors. *Proceedings of the 4th Workshop on Linked Science 2014 - Making Sense Out of Data (LISC2014)*, co-located with the 13th International Semantic Web Conference (ISWC 2014), Riva del Garda, Italy, October 19 2014. CEUR Workshop Proceedings (in press).