

# Report on the Seventh International Workshop on Location and the Web (LocWeb 2017)

Workshop held at WWW2017

Dirk Ahlers<sup>1</sup> and Erik Wilde<sup>2</sup>

<sup>1</sup>NTNU – Norwegian University of Science and Technology, Trondheim, Norway,  
*dirk.ahlers@ntnu.no*

<sup>2</sup>CA Technologies, Zürich, Switzerland, *dret@ca.com*

## Abstract

Location is an important feature in describing and understanding the real world. Consequently, it appears in many Web applications and mining approaches as a cross-cutting issue. LocWeb 2017 continues a workshop series addressing issues at the intersection of location-based services and Web architecture and was held in conjunction with WWW 2017. It combines geospatial search, information management, and Web architecture, with a main focus on *location-aware information access*. The LocWeb 2017 workshop drew contributions from various fields, including transportation and mobility analytics, social media, and urban planning. It further featured keynotes on indoor Web usage and Web standards. This report briefly discusses the theme and the contributions of the workshop.

## 1 Introduction

Location has quickly moved into the mainstream of the Web, and the mobile Web in particular. It also continues to be a strong driver of applications and research activities. We now see an increasing demand for more sophisticated location-based services, involving more powerful mechanisms in terms of information retrieval, mining, analytics, and semantics. New application areas for Web architecture, such as the Internet of Things (IoT) and the Web of Things (WoT), also mean that there will be increasingly rich and large sets of resources for which location is highly relevant.

Following the successful LocWeb workshops held in 2008, 2009, 2010, 2014, 2015, and 2016, LocWeb 2017 continues the workshop series, addressing issues at the intersection of location-based services and Web architecture. Its focus lies in Web-scale systems and services facilitating *location-aware information access*. The location topic is understood as a cross-cutting issue equally concerning Web information retrieval, semantics and standards, and Web-scale systems and services. LocWeb is an integrated venue where the location aspect is discussed in depth within an interdisciplinary community. The workshop helps advancing

---

the integration of the geospatial dimension into the Web, and promotes challenging research questions.

LocWeb 2017 is the seventh event in the workshop series and took place on April 4th, 2017 in Perth, Australia, co-located with WWW2017, the 26th International World Wide Web Conference, which was held in the Perth Convention and Exhibition Centre.<sup>1</sup>

Details, including most of the presentations made at the workshop and information about previous editions, can be found on the workshop homepage<sup>2</sup> and on the workshop series homepage<sup>3</sup>. The LocWeb report for 2016 has been published in SIGIR Forum [1] as well as those for previous years.

## 2 Workshop Theme and Topics

LocWeb solicits submissions under the main theme of Web-scale Location-Aware Information Access. Subtopics include (1) geospatial semantics, systems, and standards; (2) large-scale geospatial and geo-social ecosystems; (3) mobility; (4) location in the Web of Things; and (5) mining and searching geospatial data on the Web. The workshop encourages work describing Web-mediated or Web-scale approaches that build on reliable foundations, and that thoroughly understand and embrace the geospatial dimension.

The workshop's topics of interest were: Location-Aware Information Access, Location-Aware Web-Scale Systems and Services, Location in the Internet/Web of Things, Large-scale Geospatial Ecosystems, Standards for Location and Mobility Data, Geospatial aspects of Smart Cities, Location in Unstructured and Semi-Structured Information Sources, Location Semantics, Modeling Location and Location Interaction, Geo-Social Media and Systems, Location-Based Social Networks, Geospatial Web Search and Mining, Visual Analytics of Geospatial Data on the Web, Location-Based Recommendation, Geo-Crowdsourcing, Mobile Search and Recommendation.

## 3 Workshop Contributions

The workshop had an interdisciplinary combination of contributions, with one research keynote, one applications keynote and three full papers. The proceedings [2] are available in the ACM Digital Library and also from the conference page<sup>4</sup> as part of the WWW 2017 Companion. Slides for the papers and keynotes are available from the workshop homepage.

### 3.1 Keynotes

The first keynote was given by Martin Tomko on the topic of *Understanding Indoor Behavior: Where, What, with Whom?* [5], also offering a different view of Australia as one of the most urbanized places. The keynote discussed an ongoing research project based on a rich dataset of indoor movement, which uses Internet access points to track the movement of people through a large mall in Australia. This work combines previous separate strands of research

---

<sup>1</sup>[geo:32°57'25"S;115°51'13"E](http://geo:32°57'25)

<sup>2</sup><http://dhere.de/locweb2017/>

<sup>3</sup><http://dhere.de/locweb/>

<sup>4</sup><http://www2017.com.au/>

---

about human mobility or of local search. By logging HTTP traffic combined with the rough locations estimated by the served access point areas, new insights into information needs and information access in an indoor scenario are possible. Some methods used were to understand indoor behaviour by information needs and separate into facets of physical, information, and social behaviour, with a specific focus on spatial transitions, for example through space, through floor levels, or through functional areas. The main take-away from the analysis of the data is that analyzing indoor behavior still is a relatively under-researched area, in particular in light of the fact that the data can be spotty and thus assumptions have to be made that can help explain the spottiness, and still derive useful pragmatic behavioral insights from the dataset.

A technical keynote titled *Standards Update: GeoJSON and Geo APIs* was given by Erik Wilde. This brief update discussed the current set of standardization worked on by the IETF GeoJSON working group, as well as a set of possible future work items, including GeoJSON Text Sequences. GeoJSON is now available as IETF RFC 7946 with its own mime-type *application/geo+json* to provide a clear distinction to previous standards. The update also briefly touched upon the fact that the standards produced by this group can serve as a starting point for Web-oriented APIs for geolocation-aware services, and how API designs can take advantage of well-known standards by using and possibly extending them for certain aspects of the API design.

## 3.2 Paper Presentations

The workshop accepted 3 full papers. Our PC members provided more than 3 reviews per paper on average. With 5 papers submitted, we had an acceptance rate of 60%. We had international author groups from Europe and South America, with no cross-country authorships.

The first talk by Gilles Vandewiele presented joint work with Pieter Colpaert, Joachim Van Herwegen, Olivier Janssens, Ruben Verborgh, Erik Mannens, Femke Ongenaes, and Filip De Turck on *Predicting train occupancies based on query logs and external data sources* [6]. The paper presented an approach of predicting train occupancies for the public transit system in Belgium through crowdsourcing and external data. It also provided a good insight into the practical problems of getting access to valuable data sources, and the challenges of using the available ones to solve a given problem.

In the next paper, Marco Brambilla presented work with Stefano Ceri, Florian Daniel, and Gianmarco Donetti with the title *Spatial Analysis of Social Media Response to Live Events. The Case of the Milano Fashion Week* [3]. This paper discussed a dataset extracted from social media that is looking at how people move around and post about the Milano fashion week as an example of an event spanning large parts of a city. It provides interesting insights into events that attract a lot of attention and have a variety of spatially different venues that people have to get to. It also provides interesting insights into the lack of information that social media data inherently has, such as the question how the geolocation of a social media post is related to the geolocation of the person creating that post and the issue that popularity is a bad predictor of geospatial spread.

Finally, the paper *Could data from location-based social networks be used to support urban planning?* [4] was presented by Tiago Lima as joint work with Rodrigo Smarzarro and Clodoveu Davis Jr. This paper takes a broader view and looks at social media data as a possible input for social urban planning by estimating quality of life indicators for city

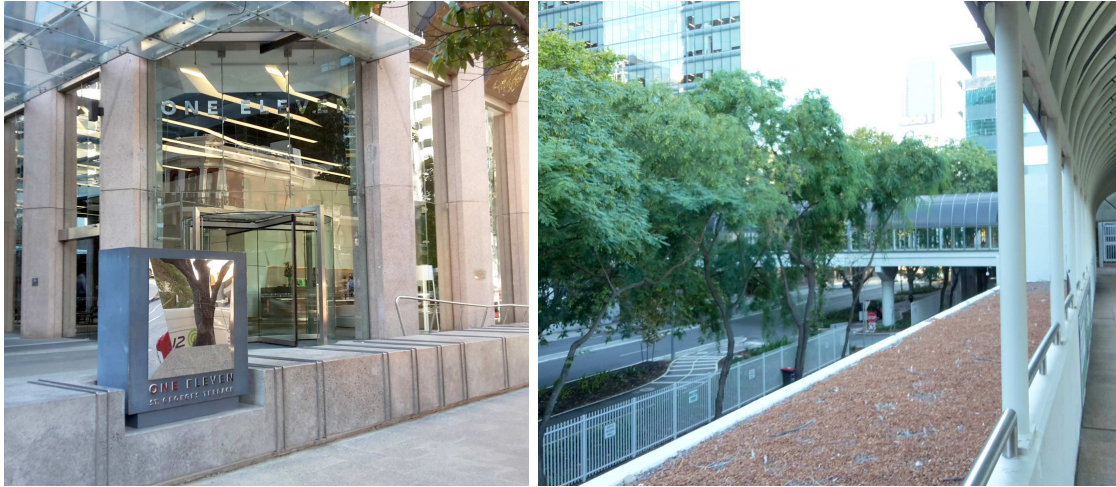


Figure 1: Perth city views: One Eleven office building house name sign; skywalk around the bus terminal and conference center in the business district.

regions. It demonstrates that some insight can be gained from analyzing social media, but that the general challenges about social media accuracy pose a challenge when it comes to using it as hard facts for planning activities.

## 4 Discussion Session

This discussion session was started by the organizers with an introduction of location-related characteristics of the hosting city encountered. This was to highlight the highly local and specific uses of location and place, show how this can lead to location being highly context- and city-dependent, and giving seeds for discussion.

Two examples we found in Perth are shown in Fig. 1. The first is the house number and house name sign for the office building One Eleven, 111 St Georges Terrace, Perth. Here, the building name reflects the house number, although spelled one eleven instead of one hundred eleven. Depending on the type of geoparser used for either address extraction from text, or for visual recognition, this may lead to unintended results as either the house name and numbers could be confused or the name only recognized as 11 and not 111.

This started more discussions on certain peculiarities on house numberings in Australia. For example, as in other rural areas, house numbers in the Australian outback could rather show the distance to a last landmark. In the huge outback, this can actually be the number of *kilometers* from the last settlement on that road. This will of course stretch the numbered places on a rural road massively and needs a very different set of assumptions that in urban or in European rural regions, for example. Another example given was that for long streets crossing multiple zip codes, house numbering may restart for each zip code instead of running through. This makes the number mostly pointless for disambiguation and makes the district essential to identify one of multiple street/housenumber combinations.

The second example shown in Fig. 1 concerns overlapping structures, in this case the walkways to the conference center. These wind through and around the center and the bus

---

station below, but also connect some of the buildings in the business district. In addition, some of the walkways connect and pass through buildings, blurring the distinction between public and private as well as indoor and outdoor space. Such structures are a recurring theme as they also appeared previous discussions such as last year [1].

Starting from this, the discussion then also revolved around general handling of elevation and the difficulty of sourcing accurate elevation and topology maps. A further point was the granularity and resolution of these and more discussion around data availability.

## 5 Conclusion and Future Directions

LocWeb 2017 attracted a wide variety of contributions, reflecting the cross-cutting issue of location on the Web, combining transportation, mobility, social media, and urban planning for a range of analyses and applications. At WWW2017 we could reach many interested and interesting participants from industry and academia. The conference itself also hosted many interesting papers including the geospatial topic. It also hosted an event based around the W3C Spatial Data on the Web WG. For the afternoon of the workshop day we invited all LocWeb attendees to join the afternoon sessions of the tutorial *The Lifecycle of Geotagged Data*<sup>5</sup>, by Rossano Schifanella, Bart Thomee, and David Shamma.

LocWeb2017 again showed that location and the Web is a very fruitful combination and that the increasing availability of data, standards, and methods allows for improving analyses and applications as well as develop the overall geospatial topic. We look forward to more exciting contributions in this field.

## Acknowledgements

We would like to thank the authors of submitted papers for their efforts, and all attendees of LocWeb 2017 for making this an interesting and interactive workshop. We specially thank Martin Tomko for his keynote. We are especially grateful to the members of the program committee for their hard work in reviewing the contributions and providing substantial feedback on a tight deadline:

Andreas Henrich, Universität Bamberg, Germany; Arjen de Vries, Radboud University; Bruno Martins, University of Lisbon, Portugal; Carsten Kessler, Hunter College, City University of New York; Chandan Kumar, University Koblenz-Landau, Germany; Claudia Hauff, Delft University, Netherlands; Clodoveu Davis, Universidade Federal de Minas Gerais, Brazil; Christoph Trattner, Know-Center, Austria; Christopher Jones, Cardiff University, UK; Faegheh Hasibi, Norwegian University of Science and Technology; Francisco López-Pellicer, Universidad Zaragoza, Spain; John Krogstie, Norwegian University of Science and Technology; Lisette Espín-Noboa, GESIS – Leibniz-Institute for the Social Sciences; Luca Maria Aiello, Bell Labs; Massimiliano Ruocco, Norwegian University of Science and Technology; Rainer Simon, AIT Austrian Institute for Technology; Ross Purves, Universität Zürich, Switzerland; Steven Schockaert, Cardiff University, UK; Yana Volkovich, Appnexus.

---

<sup>5</sup><https://sites.google.com/view/geocycle-www17/>

---

## References

- [1] D. Ahlers and E. Wilde. Report on the Sixth International Workshop on Location and the Web (LocWeb 2016). *SIGIR Forum*, 50(2):51–57, Dec. 2016. URL: <http://sigir.org/wp-content/uploads/2017/01/p051.pdf>, doi:10.1145/3053408.3053420.
- [2] D. Ahlers and E. Wilde, editors. *LocWeb '17: Proceedings of the 7th International Workshop on Location and the Web*, WWW '17 Companion. International World Wide Web Conferences Steering Committee, 2017.
- [3] M. Brambilla, S. Ceri, F. Daniel, and G. Donetti. Spatial Analysis of Social Media Response to Live Events. The Case of the Milano Fashion Week. In Ahlers and Wilde [2], pages 1457–1462. doi:10.1145/3041021.3051698.
- [4] T. Lima, R. Smarzaro, and C. Davis, Jr. Could data from location-based social networks be used to support urban planning? In Ahlers and Wilde [2], pages 1463–1468. doi:10.1145/3041021.3051700.
- [5] M. Tomko. Understanding Indoor Behavior: Where, What, with Whom? In Ahlers and Wilde [2], pages 1455–1457. doi:10.1145/3041021.3051697.
- [6] G. Vandewiele, P. Colpaert, J. V. Herwegen, O. Janssens, R. Verborgh, E. Mannens, F. Ongenaes, and F. D. Turck. Predicting train occupancies based on query logs and external data sources. In Ahlers and Wilde [2], pages 1469–1474. doi:10.1145/3041021.3051699.