Interview With Eelco Herder

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Eelco Herder works as a senior researcher at the L3S Research Center in Hannover, Germany. His main research interests include Web personalization, User Modeling, usability and HCI in general. Other research topics include Web usage analysis and the development of tools for Personal Information Management. His Ph.D. research at the University of Twente focused on the observation, modeling and prediction of user navigation on the Internet. His work on context-aware revisitation support received the Douglas Engelbart Best Paper Award at Hypertext 2011. Eelco serves as general chair for Hypertext 2016 and served as program, workshop, poster, publicity and local chair at various conferences, among which Hypertext 2014, IUI 2014, CHI 2012, UMAP 2010–2013 and Adaptive Hypermedia 2008.

You are the general co-chair of the 2016 ACM Conference on Hypertext and Social Media. What are your expectations regarding the upcoming Hypertext conference?

I expect and hope that Hypertext 2016 will be an exciting conference. This year's conference theme is "missing links on the Web", a theme that is still extremely relevant. Virtually everyone interacts with hypermedia on a daily basis. People connect with one another via social media, visit websites and follow links, post comments, and rate products or services. People manage to do this with surprising ease and yet it is common knowledge that many implementations (or reincarnations) of hypermedia concepts on the Web are suboptimal – among others in terms of user experience, efficiency, transparency and privacy.

We hope to inspire current and future researchers to focus on these "missing links" by focusing on the current role of traditional hypermedia concepts – such as spatial hypertext, adaptation and storytelling – on the Web and in social media. The conference also has a track on user experience, with a focus on cognitive processes involved when interacting with the Web. In addition, the conference will be collocated with UMAP 2016, the 24th Conference on User Modeling, Adaptation and Personalization. These are some of the reasons why we expect that Hypertext 2016 will attract researchers with many different backgrounds, including cognitive psychology, cognitive science, Web design, human-computer interaction, information science and artificial intelligence.

What is your current primary research interest?

The roots of my research lie in the fields of adaptive hypermedia and user modeling. An important focus of my research is on understanding routine patterns and particularly the deviations from such patterns. What makes an individual user different from "the average user" and which techniques are needed to better address these differences?

Strong patterns can be found in how we carry out activities, search for information, communicate with others, and how we spend our days. At the same time, just as many individual differences can be observed. And, fortunately, our lives are not 100 % determined by routine patterns. For many situations, one size perfectly fits all, but often personalized guidance, recommendations or recommendations are very helpful.

In the past decade, we experienced how the Web has become increasingly interwoven with our daily activities. We go online for planning our trips, for buying things we need, for obtaining feedback on products or services. As a natural consequence, my focus has broadened from Web usage per se to understanding and modeling the user's context, including travel activities and food preferences.

Please tell us about your vision in this field of research.

Personalization is ubiquitous on the Web. Search engines adapt their results to what they know about the user, online stores recommend products that they think we are interested in, and social media sites prioritize what we see from our "friends" based on our previous activities. Ironically, it seems that the recommendations that we receive are based on very simple models – even though I am convinced that major companies have the data, the tools and the brains to do a better job.

A reason for this discrepancy might be that personalization still often takes place without involvement or feedback from the users. As a result, companies limit themselves to "safe" recommendations, which are relevant but often also too obvious. I have the impression that HCI aspects – such as explanations, user feedback, privacy, trust and reputation – gain more and more attention in the field of recommender systems. I expect and hope that progress in these fields will be reflected in the personalized Web that we use on a daily basis.

In general, I think that it is unavoidable and very desirable that users will be empowered to actively manage their profiles and activity traces on the Web themselves. Adaptive hypermedia techniques, narrative explanations and visualizations will probably play an essential role in this process.

How has hypermedia influenced your work?

Associative linking is a concept that has deeply influenced the way I look at information. On a superficial level, it is useful to recognize the different roles that links play on a website and to apply this knowledge for more effectively designing the link infrastructure of a site. On a deeper level, thinking in terms of different kinds of associations is very helpful for understanding different perspectives and for structuring information.

Would you briefly outline how your personal view of hypermedia has evolved over time?

About 10–15 years ago, I regarded hypermedia – and the Web in particular – as a large and growing hairball of information, in which it was easy to get lost or disoriented. Disorientation was commonly seen as a main reason for not being able to find what one was looking for or to carry out certain tasks. Disorientation – also called cognitive overload – was one of the main motivations why many researchers thought that hypermedia should be adaptive to the user and the user context.

I still see many benefits in Web personalization and recommendation, but I do not think that nowadays the average user feels disoriented when using the Web. On the one hand, we all have become used to the idea that the Web provides more information and services than we can consume in one lifetime; in addition, we have a handful of landmarks that we can easily access and that largely fulfill our needs. On the other hand, the Web infrastructure has evolved as well. Search engines and projects such as Wikipedia make information dramatically easier to find and I believe that users are quite confident that "if they cannot find it there, they will find it elsewhere".

As a downside, most people appear to use the Web in a very limited way, spending most of their time on only a handful of sites. The filter bubble that most users experience is not only created by algorithms, but also by the users' own choices.

What are specifics of the relationship between hypertext and HCI? What form have those taken over time?

In a sense, hypertext is a very simple construct: it is text that contains links to other texts. However, this construct has proven to be a very powerful mechanism for structuring information. The World Wide Web is essentially hypertext and I see the Semantic Web and the Linked Data initiatives as natural and very useful mechanisms for creating additional layers of linking. From an HCI perspective, I think that hypertext is an important paradigm for anyone who aims to present documents, information, data, recommendations, visualizations – basically all kinds of things that are related.

What issues in HCI are particularly important for hypertext and/or the Web?

Unsurprisingly, a particular issue in HCI is how to deal with the ever increasing use of mobile devices and tablets. Apart from finding interaction mechanisms and interface designs that work on a wide range of devices, a particular challenge for the Web community – and the (adaptive) hypertext community – is how to respond to the shorter attention span and the mobile user context that are associated with the use of cell phones. I think it is clear that just adding a responsive template is not the whole solution and that we also need to rethink the way we structure information.

In mobile user contexts, information needs are typically more direct and probably easier to satisfy. At the same time, time constraints are often more pressing and attention needs to be divided between the device and the context. This asks for more guidance and perhaps the users' navigation options should be limited for the sake of efficiency. As a comparison:

information retrieval systems and search engines usually provide a virtually endless list of results. Instead, it might make sense to think of mobile search as a recommendation task in which only n options can be given to the user.

What is special about hypermedia? What role do those topics have within computer science?

This is a tricky question. I consider hypermedia as a paradigm, a way of thinking, rather than as a particular technology. All kinds of linked information, even relational databases, can be regarded from a hypertext perspective. As an example, Web crawling is as much an engineering problem as a more theoretical hypermedia problem that involves defining optimal link following strategies. One more example: WIMP-style interfaces (WIMP stands for Windows, Icons, Menus, Pointer) also contain several kinds of links and shortcuts. Even dynamics in social networks can be regarded as links between hypermedia nodes.

Therefore, the hypertext community constantly needs to define and redefine itself. When you look at the Hypertext proceedings from the early 1990, many submissions concerned dedicated hypermedia systems with a particular, clearly articulated purpose. Later on, the focus shifted to various aspects of the Web and the way it is used. Cognitive aspects and the need for adaptation have always been important topics of the conference, just as well as hypertext narrative and Web semantics. I think that the first track on social linking was at Hypertext 2008 in Pittsburgh. Since 2012, the official name of the conference has changed from "Hypertext and Hypermedia" to "Hypertext and Social Media".

What is your take on future developments in hypermedia? What one thing would you most like to see in hypermedia research and development?

In our knowledge economy, the ability to find and relate different pieces of information becomes ever more important. The Linked Open Data movement does a very good job at making data available for aggregation, combination and transformation. I think that the Hypertext community can contribute to this by providing general principles on how linked data can be – automatically or semi-automatically – exposed to users in a meaningful way. The principles of spatial hypertext could play a major role in achieving this.

People have become quite comfortable with different types of information visualizations, which are regularly shown on various popular websites, for example as background information in news articles. In most cases, however, the visualizations are self-contained. Adding links to visualizations would already provide a basic spatial hypertext, wouldn't it? In the next couple of years, I hope to see design principles, metaphors, authoring tools and proofs-of-concept that bring spatial hypertext to the end-user, to allow them to explore, find and relate visualized information from a wide range of sources.

If you had the choice, would you dis-invent any technological advancement?

Perhaps dis-inventing is not the proper word, but I think it is a good thing that proprietary solutions for serving multimedia via the Web are gradually becoming deprecated and replaced by new open standards.

What will be the next big thing in IT technology in general?

To quote Niels Bohr: prediction is very difficult, especially about the future. However, I think that the next big thing will not be as sexy as 3D printing, wearable technology or self-driving cars.

Dr. Claus Atzenbeck (http://www.atzenbeck.de) holds a professor position at Hof University, Germany and is leading the Visual Analytics research group at the university's Institute of Information Systems (http://www. iisys.de). His research interests in the field of hypermedia include spatial and navigational structures, spatial and temporal parsing for spatial hypertexts, and hypertext narratives. A specific focus of his work is on intelligent user interfaces for visual analytics. Dr. Atzenbeck has been involved in various tasks for the previous European Seventh Framework Programme (FP7) and the current European Programme Horizon 2020 including serving as an expert reviewer for proposals or as a collaborating researcher on projects.