

# L3S @ work

Web Science – Investigating the Future of Information and Communication

## ALEXANDRIA – Exploring the Past of the Web



The ALEXANDRIA project (ERC Nr. 339233) aims to develop models, tools and techniques necessary to explore and analyze Web archives in a meaningful way. ALEXANDRIA will significantly advance semantic and time-based indexing for Web archives using human-compiled knowledge available on the Web, to efficiently index, retrieve and explore information about entities and events from the past. The ALEXANDRIA Testbed will provide relevant collections and algorithms that enable further research on and practical application of research results to existing archives.

Easy access to historical Web information becomes more and more important, as significant parts of our cultural heritage are produced and consumed online. Traditional institutions keeping our cultural heritage need to be complemented with facilities for preservation and public access of online cultural assets. The ALEXANDRIA project aims to develop models, tools and techniques necessary to archive and index relevant parts of the Web, and to retrieve and explore this information in a meaningful way.

While the easy accessibility to the current Web is a good baseline, optimal access to Web archives requires new models and algorithms for retrieval,

exploration, and analytics that go far beyond what is needed to access the current state of the Web. This includes taking into account the unique temporal dimension of Web archives, structured semantic information already available on the Web, as well as social media and network information.

Within ALEXANDRIA, we will significantly advance semantic and time-based indexing for Web archives using human-compiled knowledge available on the Web, to efficiently index, retrieve and explore information about entities and events from the past.

An important challenge when working with long-term archives and Web archives is the proper dating of the documents. We developed a content-based method and use recent advances in the domain of term burstiness, which allow it to overcome the drawbacks of previous document dating methods, e.g. the fix time partition strategy. We use an extensive experimental evaluation on different datasets to validate the efficacy and advantages of our methodology, showing that our method outperforms the state of the art methods on document dating.

Working with Web archives raises also a number of issues caused by their temporal characteristics. De-

pending on the age of the content, additional knowledge might be needed to find and understand older texts. Especially facts about entities are subject to change. In order to find entities that have changed their name over time, search engines need to be aware of this evolution. We tackle this problem by analyzing Wikipedia in terms of entity evolutions mentioned in articles, and have investigated algorithms for entity resolutions which scale to Web size, in order to identify entities regardless of how they are mentioned or referred to in our data. In the future, providing correct entity annotations for large Web will enable semantic search over temporal collections, making it much easier to follow evolution of and discussion about entities and topics over time.

The ALEXANDRIA Testbed will provide an important context for research, exploration and evaluation of the concepts, methods and algorithms developed in this project, and will provide both relevant collections and algorithms that enable further research on and practical application of our research results to existing archives like the Internet Archive, the Internet Memory Foundation and Web archives maintained by European national libraries.

(more about ALEXANDRIA on page 2)



Prof. Wolfgang Nejdl, L3S Executive Director

### Solving Big Data and Data Science Problems

With the amount of data doubling every two years, big data is quickly becoming the third important factor of production, in addition to operating capital and human capital, enabling higher efficiency of economic processes as well as new business models.

Big data is being produced in production and commerce, connected sensors and devices, Web and social media, as well as in experimental research in medicine and other areas. Data science methods and algorithms help us make sense of these data, and enable smart data innovation, intelligent mobility, personalized medicine and more effective clinical research, as well as computational social science and digital humanities. Data science algorithms connect and interpret large and heterogeneous amounts data, to extract knowledge, predict trends, personalize services, and support decision making and logistics.

Current L3S research groups already focus on large scale information retrieval, search and analytics, exascale computing, as well as advanced multimedia and video analysis, in the context of two ERC grants, EU and BMBF consortia, as well as applied research and development projects together with industrial partners. Two new professorships will further expand our core competencies in data mining, statistics and visual analytics later this year.

Our web governance group provides important core competencies for building privacy by design into our algorithms and infrastructures, focusing on law, legal constraints and privacy considerations in the context of clinical research and personalized medicine as well as on the social web. Developing new guidelines for privacy, property and internet governance needed to set up an improved governance structure for the EU innovation ecosystem is another focus, placed in the context of the European Union's Digital Agenda.

Contact us to explore with us how to solve your big data and data science problems, we are looking forward to new cooperations and projects!

*W. Nejdl*

## Real Time Face Tracker at Cebit 2015

With fresh impulses, L3S presented its research results in the field of Web Science at the world's biggest IT fair in March 2015

At the research booth of the Federal State of Lower Saxony, L3S provided an insight into the area of contact-free human-computer interaction. The team of L3S member Prof. Dr.-Ing. Bodo Rosenhahn demonstrated the project "Real time Object Tracking in Video Streams – Game Control with Face Tracking" to the public and to prominent guests. Together with L3S researchers, the President of the Leibniz Universität Hannover, Prof. Dr. Volker Epping, and the LUH-Vice President Prof. Dr. Joachim Escher welcomed Lower Saxony's Prime Minister Stefan Weil and the Minister for Culture and Science Dr. Gabriele Heinen-Kljajic as well as Hauke Jagau, the President of the Hannover Region, at the L3S exhibition space.



President of the Hannover Region Jagau and Lower Saxony's Prime Minister Weil with L3S Team

move a mouse cursor on a display in order to control a simple maze game.

In the future, contact-free human-computer interaction will gain more and more importance in order to increase the efficiency of communication with computers. It can be applied in the area of gesture-driven computer-interaction in sterile environments, elderly homecare, sports analysis, and also in the

game and movie industry. Since devices such as the Kinect are already well established, plain video-based interaction will attract increasing attention in outdoor scenarios.

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For more information please have a look at:  
<http://www.L3S.uni-hannover.de/project/RelTracking>

The researchers of the L3S Research Center presented a camera-based face tracker. The tracker uses a virtual network structure to allow stable and fast tracking while being robust against severe occlusions and illumination changes. The tracker output is used to

# Science 2.0 – How the Social Web Is Changing Science



## Interview with Prof. Dr. Klaus Tochtermann

Prof. Dr. Klaus Tochtermann is professor at the Institute for Computer Science at Kiel University and also the director of the ZBW – the German National Library of Economics and Leibniz Information Centre for Economics. Klaus Tochtermann studied computer science at the universities of Kiel and Dortmund. In 1995 he received his doctorate in computer science Dortmund University with a thesis on “A model for hypermedia: description and integrated formalisation of essential hypermedia concepts”.

Since October 2000 Prof. Tochtermann has been the director of Austria’s first industry-based research institute on knowledge management Know-Center and in 2002 he received his habilitation in the field of applied information processing with the thesis “Personalisation in the Context of Digital Libraries and Knowledge Management”. In 2004 he was appointed as professor for knowledge management at Graz University of Technology and since 2010 Klaus Tochtermann is director of the ZBW and professor for media informatics at Kiel University.

Klaus Tochtermann initiated the Leibniz Research Alliance Science 2.0 in 2012. This research alliance addresses the question of how the participatory Internet (e.g., social media) changes research and publishing processes, and how information infrastructure institutions can participate in the shaping of these changes. Klaus Tochtermann is interviewed by the L3S member Robert Jäschke, who is professor at the Institute of Knowledge Based Systems at the Leibniz Universität Hannover as well as the representative for L3S at the Research Alliance Science 2.0:

### What is Science 2.0?

Science 2.0. addresses the question of how research and publication processes change due to the social web and how information infrastructure institutions must adapt accordingly. For example, the amount of scientific publications in the form of blog articles or scientific Wikis is increasing. These types of platforms are naturally optimally linked with each other so that feedback between researchers can take place much faster than with traditionally printed publications. In addition, scientific discussions are also taking place with more frequency online and virtually. As part of this discussion scientific literature is also being exchanged with more frequency in a self-organised fashion without the involvement of libraries. One question that we ask ourselves is what effects the new feedback channels as well as the increased publication speed have on research. From the point of view of libraries we must ask ourselves how we can assist this decentralised peer-to-peer literature provision.

*What insights on the changes in science, which have been introduced thereby, are already available thanks to Science 2.0, the Leibniz research alliance initiated by the ZBW?*

First we examined what kind of user types actually exist in the area of scientific and social medias. On the one extreme is the Nerd, who utilises everything available and is open to new networks that are not yet stable. On the opposite end are the conservatives, who do not know where to begin when it comes to social networks and as a result do not teach their students about this media, which is absolutely essential in this day and age. Why is this subject so important for scientific libraries? This subject is in fact very important. We are basically looking at a movement here that has already started. Although the researchers use the tools there has yet been no one who has systematically addressed and processed the problems addressed therewith. A serious shift of scientific information from printed media to digital media is taking place – no longer in the form of PDF files but in new forms of publications like Wikis and

blogs that are then distributed via Facebook, Google+ and other channels. This enormously enhances the existing mechanisms of information provision. It is the responsibility of libraries to understand and further develop these mechanisms.

### What does the library of the future look like?

Scientists will reduce their searching efforts as content will come to them online – as a service provided by the library. One begins to write their text and the library system analyses it and supplies relevant literature. Also, when scientists or researchers spend time in social media or Wikipedia and follow certain Facebook pages or Twitter accounts, scientific background literature is offered proactively with it.

The paradigm of the library will change radically. In the past we have done everything to get users to use our beautiful reading halls. They still need to access our search system more actively. In the future we will work

a lot more with the “information push”, in other words taking information to where users spend time online. Like in a blog they are writing a text in.

### Which aspects of Science 2.0 are particularly important for scientists?

We still have a very complex legal situation in the social web. This concerns data protection, privacy and copyright in social media channels. Often scientists are not aware that they violate these laws. Policy makers should provide a framework in which scientists can work without worrying about these legal issues. Another aspect concerns credits for the social media performance of scientists. Currently, scientific excellence is measured by very traditional instruments, such as h-index (i.e. number of citations) and no standardised indicator exists which give credits for the social media presence and engagement of scientists. Within this context we need standardised alternative metrics (altmetrics) which supplement the current metrics.

### The ZBW – Leibniz Information Centre for Economics

is the world’s largest information centre for economic literature, online as well as offline. Its origins date back to 1919 where it was founded as the library for the Kiel Institute for the World Economy. For its excellence and radical innovation, ZBW has been awarded as “Library of the Year 2014” in Germany. Today the institution holds more than 4 million volumes and subscribes to 26,000 periodicals and journals. In addition, the ZBW

provides the fastest-growing collection of Open Access documents on the internet: EconStor, the digital publication server, currently gives free access to 60,000 articles and working papers. The ZBW is a member of the Leibniz Association and has been a foundation under public law since 2007.

More information: <http://www.zbw.eu/en/>

### Leibniz Research Alliance Science 2.0.

The transdisciplinary Science 2.0 examines the effects of Science 2.0 on scientific research and society. “New working habits”, “technological development” and “user behaviour research” are at the centre of these research efforts. The Research Alliance is incorporated in the Leibniz Association and currently consists of 37 partners, including the L3S Research Center. They

represent numerous disciplines, and include Leibniz institutes, university-affiliated, and independent research institutions from Germany, Austria and Switzerland. The Alliance brings together both stakeholder groups crucially affected by Science 2.0 – the library community and the scientific community.

More information: <http://www.leibniz-science20.de/en/>

## 1st International Alexandria Workshop

The 1st International Alexandria Workshop on September 15th/16th 2014 at the L3S Research Center attracted around 50 researchers and practitioners involved in Web Archiving, Digital Preservation, Digital Humanities and Information Retrieval from all over the world to get insights in the newest developments and trends in using and analyzing Web archives.

The workshop was opened by a keynote of Wolfgang Nejdl – principal investigator of the Alexandria ERC grant project and director of the L3S Research Center. He presented his vision and major research challenges to be addressed in the context of the project within the next five years.

During the “Web Archives in Practice” session Elisabeth Niggemann (Director of the German National Library) and Reinhard Altenhöner (German National Library) presented their experiences and ambitions of the German National Library in the area of Web archiving. Afterwards the current status and next steps on building a worldwide Web Observatory were shown by Wendy Hall (University of Southampton).

The aspect “Temporal search and retrieval” was addressed from different directions. Elena Demidova (L3S) presented ongoing work on the creation of focused Web archives for scientists. Temporal Web dynamics and the implications for information retrieval was the



topic of Nattiya Kanhabua (L3S). Finally Norbert Fuhr (University of Duisburg) presented his research about user-oriented design of search interfaces.

Web Archive analytics was the topic of the last session at the first day of the workshop. Maarten de Rijke (Uni-

versity of Amsterdam) gave insights into the possibilities that exploratory entity search offers over time. Matthew Weber (Rutgers University) presented how large scale data sets help to generate new theories about social interactions. Different kinds of visualizations of Web

archive analysis results were the main topic of Masashi Toyoda’s (University of Tokyo) presentation.

The second day was opened by a keynote from Helen Hocks-Yu (British Library) about crawling the British Web and the process of indexing and providing access

to billions of archived web resources.

After the coffee break Avishek Anand (L3S) spoke about the evolution of the German Web by showing the age or the growth rates of Web pages in Germany. This analysis was complemented by Vinay Goel (Internet Archive) with his presentation on the current state of the art tools in analyzing Web archives. Claudia Niederee presented ongoing activities in the European project ForgetIT which focuses on digital forgetting.

During the final session of the workshop recent research results on Advanced Random Walk Techniques for Social Media Analysis were shown by Xiaofei Zhu (L3S). The creation of the WikiTimes Knowledge Base of News Events was the topic of Mohammad Alrifai’s presentation.

The workshop ended with an open discussion round on the many new ideas and insights in current and future research on temporal Web archive access and analytics. The International Alexandria workshop will be continued as an annual event.

# L3S Fosters Entrepreneurship

Generating new knowledge and turning it into new products and services is crucial to maintain and enhance the economy's competitiveness. Hence, universities are expected to transfer their knowledge and technology to industry. University spin-off companies are regarded as an important tool for the commercialization of knowledge and research. Therefore, the L3S management has decided to promote the transfer of research from L3S and associated faculties by supporting entrepreneurship. At the same time, the government has further improved the EXIST support programmes for starting up a business at university. At L3S two teams – Tutao GmbH and Happenizer UG (see below) – already received funding by EXIST and founded a start-up. The aim of L3S is to create more university-based start-ups. As a start, L3S organizes a series of Entrepreneurship Talks to give students, graduates and scientists an understanding of entrepreneurship as a career opportunity. L3S also offers workshops, consulting and workspace to help students and scientists generate sustainable ideas and set up their own business.

Startup@L3S  
Entrepreneurship-Center



*L3S Startup HAPPENIZER: Internet platform finds suitable leisure time activities and like-minded people*

## Get Out of the Virtual World and Into Real Life

What should I do this weekend? Those who are looking for suggestions or like-minded people will soon be able to turn to the leisure time platform [www.happenizer.net](http://www.happenizer.net) for help. Stefan Hoffmann (at center in photo) is one of the company's three founders.

**Mr. Hoffmann, do you have any free time at all, as the founder of a startup?**

Hoffmann: Well, I did have to learn how at first. When you're just launching a company like this, everything is new, and everyone is thrilled to throw themselves into it. But we definitely went overboard during the first year.

**What motivates you to work so hard?**

I have a lot more responsibility, but also more freedom. If I work a lot, I do so voluntarily so that the company can get ahead – even though there are many uncertainties, and you are sometimes dependent on external partners. Besides that, we firmly believe in our idea and our concept.

**How do you plan to achieve that?**

What makes for fulfilled free time? We want to do something we find exciting, something we can do together with friends and like-minded people. Users can use the platform to find the right option and get to know new people during these activities.

Did you get the idea for the Happenizer platform during your free time?

Yes, it came up on the soccer field. We always had to call around to a lot of friends – but we still couldn't get enough players together. That was when we started developing the first ideas about how we could meet up with other soccer fans. Our idea stuck with us even when we were in college, and we worked toward starting our own business. For example, we got in touch with the L3S Research Center in Hannover early on. We put together a plan in 2011, and we were finally able to get started in 2013, when the funding was approved.

**Is the technical realization already complete?**

Yes, we're very happy with it. Roland Rodde and Jan-Felix Woge developed what we call an Event Crawler. This software searches through organizer websites completely automatically and imports data and images into our database on an updated basis. The functionality that customers can experience is also highly advanced: The user creates an individual profile on the platform or imports his or her Facebook profile and then receives suitable suggestions for activities from all of the urban leisure time options offered. Our system learns what the user likes or clicks to dismiss. The user can contact like-minded people or decide to deny contact requests. The system also guarantees a high level of privacy protection and data security.



**So what are the biggest challenges ahead these days?**

There are strategic reasons for the fact that we have not yet launched on the market. For example, we are still working on cooperative initiatives. Financing is also a crucial hurdle. We are in close talks about that now. We will definitely start offering our service in Hannover first.

<http://www.happenizer.de>

Condensed version of an interview by Christina Amrhein-Bläser, uni transfer, Leibniz Universität Hannover in 2014.

Teamwork is the only way to reach success! The founders of Happenizer are an excellent team: Physicist Dr. Roland Rodde (from left) is responsible for R&D, while Stefan Hoffmann, who has a management background, handles project management, HR, and financing, and mechatronics engineer Jan-Felix Woge is responsible for technical conceptualization and development.

*L3S Startup Tutao GmbH developed secure webmail systems*

## Encrypt It All: Tutanota Makes It Easy



Tutao team with founders

Three years ago, we, the founders of Tutao, M. Pfau, A. Möhle und T. Gutsche started our company at L3S. This proved to be a solid foundation for our project of securing your e-mail communication from prying eyes. 2014 we released our open source webmail service with integrated, easy-to-use encryption. The feedback we receive from tech-bloggers, our constantly growing user base and IT experts is amazing so that despite all the challenges a start-up brings along we fight on! We are also very happy that we were honored as one of Germany's Digital Heads by the Digitale Gesellschaft.

Now we continue to develop Tutanota so that it will become a competitive alternative to current insecure e-mail applications like Gmail or Gmx. We are about to release mobile apps to make the e-mail client on mobile devices more convenient. For the future we plan to make Tutanota usable with custom domains. In addition to the e-mail client we want to add a calendar and file sharing. Of course everything will be encrypted. Since Tutanota is open source others can verify that the code of Tutanota does not contain a backdoor. We welcome all students and IT professionals to have a look at our application and to give us feedback!

<http://www.tutao.de>



*ERC Proof-of-Concept: Bridging the gap between research and innovation*

## Individual Implant Placement

Since 2014, the ERC Proof-of-Concept (PoC) project "Individualized Implant Placement (IIP)" has been successfully running at L3S. It helps the ERC grant-holder and L3S-Member, Prof. Bodo Rosenhahn, to bridge the gap between research and the earliest stage of a marketable innovation. As a part of the ERC starting grant Dynamic MinVIP, the key goal is to establish the innovation potential of ideas arising from the ERC-funded frontier research project.

Since Dynamic MinVIP deals with human motion and shape analysis by focussing on statistical and geometric

relationships in large medical motion/shape databases, the PoC funding is used for development towards a product in the area of implant placement planning, e.g. for hip or knee surgery. Engineers from L3S work closely together with medical doctors from the orthopedics department at the Hanover Medical School to bring the potential to life, to ensure better planning and, thus, better surgery, less revisions and less pain after surgery. The method is based on PCA (principal component analysis). Eigenvectors of maximal eigenvalues of the covariance matrix of the underlying database are used for correlation analysis and missing data estimation,



often occurring in sensor measurements. Additionally, a physical model is currently being developed to estimate the torques and forces acting on the involved joints. Thus, a powerful statistical model incorporating geometric and physical constraints is under development.

For more information:

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Research group "Next Generation Internet" / Head of a group on automated image interpretation at LUH

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# Successful Doctoral Examinations in 2014

*Prof. Dr. Rita Kupetz*

June 2014 | **Dr. phil. Ivana Marenzi** successfully completed her doctorate studies on the topic "Multiliteracies and e-learning 2.0". Her defense took place at the L3S with Prof. Rita Kupetz and Prof. Gabriele Blell (English Seminar, LUH) as well as Prof. Anthony Baldry (University of Messina, Italy) in the reviewing committee. The thesis intends to integrate a strong pedagogical foundation, multiliteracies, with a new kind of e-learning environment tapping the potentialities of social networks for learning, LearnWeb2.0.

*Prof. Dr. Wolfgang Nejdl*

June 2014 | **Dr. rer. nat. Avaré Stewart** has defended her thesis "Automatic Text Filtering Using Limited Supervision Learning for Epidemic Intelligence (EI)" successfully. She completed her doctorate studies on tackling the label bottleneck problem for the domain of EI, using limited supervision approaches to learning - i.e, alternative ways of filtering disease reporting mentions that mitigate and/or avoid undue burden on an annotator. Her defense committee was composite i.a. by Prof. Nejdl (L3S), Prof. Smith (L3S).

October 2014 | **Dr. rer. nat. Sergiu Chelaru** with his topic: "Mining, Analyzing and Exploiting Community Feedback on the Web" studied implicit feedback on the web, namely community sentiments in Web queries. Sergiu Chelaru received his doctorate. in Computer Science at the L3S Research Center, Leibniz University of Hannover. The PhD committee consisted of Prof. W. Nejdl (L3S), Asst. Prof. I.S. Altingövde (Middle East



Technical University, Turkey), Prof. H. Vollmer (LUH) and was chaired by Prof. K. Schneider (LUH).

October 2014 | **Dr. rer. nat. Ricardo Kawase**, successfully completed his doctorate studies on the topic "Building and exploiting context on the Web", which presents several studies regarding the different aspects of context on the Web. His defense took place with Prof. Wolfgang Nejdl (L3S), Prof. Daniel Schwabe (PUC, Rio, Brasil) and Prof. Heribert Vollmer (LUH) in the reviewing committee.

*Prof. Dr. Matthew Smith/Prof. Gabriele von Voigt*  
September 2014 | **Dr. rer. nat. Benjamin Henne** completed his doctoral studies with his thesis: "Methoden zur Schaffung von Bewusstsein über persönliche Informationen als notwendige Voraussetzung für den Schutz

der Privatsphäre". In it's work, B. Henne proposed measures exemplarily, which covers different aspects of the awareness about personal information: the disclosure by others, the existence of hidden information and its implicit revelation, as well as the conscious disclosure by the users.

October 2014 | **Dr. rer. nat. Marian Harbach** has defended his doctoral thesis "On The Adaption of End-User IT Security Measures" successfully. In this thesis, M. Harbach present a practical view on the topic of IT security, based on five studies and provides important insights into the human factors that influence the adoption of IT security measures. The presented research informs future design, development, and deployment of user-facing IT security measures.

## Awards

*University Award for Claudia Maribel Orellana Rodriguez*

ITIS graduate **Claudia Orellana** (fig. right) received one of this year's university prizes, awarded by the Friends of the Leibniz University and its managed foundations. The prize is endowed with EUR 500 and was officially awarded at the Leibniz House in Hannover. The awarding of the DAAD prize and the university prizes through the President of the Leibniz University of Hannover took place during the meeting of the DAAD scholarship holders.

*Best Demo Award at the Extended Semantic Web Conference 2014*

The L3S was involved in numerous activities at ESWC 2014 (Extended Semantic Web Conference), such as research paper presentations, organization of workshops and chairing of sessions dedicated to the L3S-led LinkedUp project, funded by the EU, during the main conference. One of the presented works, a system demonstration led by **Bernardo Pereira Nunes** (PUC



Rio) and co-authored by L3S' **Dr. Stefan Dietze** has been selected as winner of the "Best Demo Award" of the conference, a further proof of the fruitful and long-standing collaboration between the L3S and the Pontifical Catholic University of Rio de Janeiro (PUC Rio, Brasil).

The awarded work introduces the SCS Connector tool, a web-based application to assist users on the discovery of semantic links between web resources. For more information: [2014.eswc-conferences.org](http://2014.eswc-conferences.org)

*L3S Research team is the People's Choice winner at the LinkedUp Vidi Challenge*

Vidi, the second of three consecutive competitions, sponsored and organized by the EU-funded project "LinkedUp", had the goal to gather interesting and innovative tools and applications that analyze and integrate open web data for educational purposes. With this goal in mind, the three L3S researchers **Dr. Ricardo Kawase**, **Ujwal Gadiraju** and **Patrick Siehndel** proposed the DBLPXplorer, a set of interactive visualization tools to facilitate the browsing and discovery of scientific work. The work was awarded the People's Choice Winner – a category where the audience chooses the winning team.

More information: <http://linkedup-project.eu>

## Four New Members at L3S

**In 2015, four new professors strengthen the research in Web Science and in their related fields. In total, L3S counts 17 professors in five research groups. In the L3S research group Next Generation Internet (NGI) there are new:**

**Marcus Magnor** heads the Computer Graphics Lab of the Computer Science Department at Technische Universität Braunschweig (TU BS). He received his BA (1995) and MS (1997) in Physics from Würzburg



Prof. Marcus Magnor (TU BS)

University and the University of New Mexico, respectively, and his Dr.-Ing. in Electrical Engineering from Erlangen University in 2000. For his post-graduate studies, he joined the Computer Graphics Lab at Stanford University.

**Jörn Ostermann** studied Electrical Engineering and Communications Engineering at the University of Hannover and Imperial College London, respectively. He received Dipl.-Ing. and Dr.-Ing. from the University of Hannover in 1988 and 1994, respectively. In 1994 and 1995 he worked at AT&T Bell Labs. He

was with AT&T Labs-Research from 1996 to 2003. Since 2003 he is Full Professor and Head of the Institut für Informationsverarbeitung at the Leibniz Universität Hannover, Germany. His current research interests are video coding and streaming, computer vision, 3D modeling, face animation, and computer-human interfaces.



Prof. Jörn Ostermann (LUH)

**Two professors start in the new L3S research group Virtual Communities (VC) :**

**Kurt Schneider** studied Computer Science at Friedrich-Alexander-Universität Erlangen (Germany). He received his Dr. rer.nat. in Software Engineering. From 1994 to 1996 he held a postdoctoral position at the Center for LifeLong Learning and Design (L3D) at the University of Colorado at Boulder, USA. From



Prof. Kurt Schneider (LUH)

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