Overview on Seminar Topics

Summer 2016

Institute of Information Systems and Marketing (IISM)
Karlsruhe Service Research Institute (KSRI)

Agenda

	Agenda
1	Bachelor Degree
2	Master Degree

State-of-the-Art Literature Review in Pervasive Systems (BA)

Supervisor: Raphael Rissler

Problem Description: With today's development in wireless and mobile technologies, more and more systems are connected to sensors in order to detect individuals' usage context and provide services adapted to their needs and requirements. In particular, when aiming to design information systems (IS), which assist their users only in situations, when the assistance is required, the usage of sensor data and thus, the implementation of a pervasive system is inevitable. Connecting theses sensors to an IS is often subsumed under the umbrella term of pervasive systems. Today, there are many different systems such as Scatterbox (a message forwarding system), MATCH (a health-care system for elderly and disabled people at home), or CityEvents (a mobile multimedia system for displaying geolocated cultural events). However, the term pervasive systems is not clearly defined. In the context of connecting sensor devices to one system, ubiquitous systems or adaptive/autonomic systems are also often mentioned by researchers.

Goal of the Thesis: The goal of this seminar thesis is to provide an overview on the state-of-the-art in information systems literature, define the term of pervasive systems and demarcate the concept from others like ubiquitous or adaptive systems.

Starting Literature:

- Henricksen, K., Indulska, J., and Rakotonirainy, A. 2002. "Modeling Context Information in Pervasive Computing Systems," in Pervasive Computing (Vol. 2414), pp. 167–180
- Savas Konur and Michael Fisher (2015). A roadmap to pervasive systems verification. The Knowledge Engineering Review, 30, pp 324-341.
- Scellato, S., Musolesi, M., Mascolo, C., Latora, V., and Campbell, A. T. 2011. "NextPlace: A spatio-temporal prediction framework for pervasive systems," in Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics) (Vol. 6696 LNCS), pp. 152–169
- Henricksen, K., Indulska, J., and Rakotonirainy, A. 2002. "Modeling Context Information in Pervasive Computing Systems," in Pervasive Computing (Vol. 2414), pp. 167–180

Knowledge Presentation in Intelligent Systems (BA)

Supervisor: Dr. Stefan Morana & Peter Hottum

Problem Description: Intelligent systems support and enable the humans' interaction with the intelligent system using a build-in knowledge base. Although the usage and outcomes of intelligent systems are well researched, the actual presentation of the knowledge requires further research.

Goal of the Thesis: The seminar thesis goals are: (1) summarize and contrast different types of knowledge representations which are provided by intelligent systems, for example textual, spatial, and visual knowledge representations; and (2) investigate and discuss the existing design knowledge on knowledge presentation in intelligent systems.

Starting Literature:

- Gregor, Benbasat: Explanations from intelligent systems: Theoretical foundations and implications for practice. MIS Quarterly. 23, 497–530 (1999).
- Delisle, Moulin: User Interfaces and Help Systems: From Helplessness to Intelligent Assistance. Artificial Intelligence Review. 18, 117–157 (2002).
- Ware: Information Visualization: Perception for design, Morgan Kaufmann, Third Edition

The Concept of Enjoyment in IS Use – A Literature Review (BA)

Supervisor: Dr. Silvia Schacht

Problem Description: In the era of ludification and gamification, more and more information systems (IS) aim not only to offer a certain functionality to the user, but also to increase users' enjoyment when using the service. However, the concept of enjoyment in IS research is multifaceted. There are similar concepts such as fun, flow, engagement, arousal, happiness, or pleasure.

Goal of the Thesis: This seminar thesis aims to provide an overview on the concept of enjoyment in IS research. Thereby, the seminar thesis should demarcate the concept of enjoyment from related concepts and examine how enjoyment can be measured (by using self-reported constructs, but also by using of physical measures).

Starting Literature:

- Lin, A., Gregor, S., Ewing, M.: Developing a scale to measure the enjoyment of Web experiences. J. Interact. Mark. 22, 40–57 (2008).
- Liu, D., Li, X., Santhanam, R.: Digital Games and Beyond: What Happens When Players Compete. MIS Quarterly. 37, 111–124 (2013).
- Gregor, S., Lin, A.C.H., Gedeon, T., Riaz, A., Zhu, D.: Neuroscience and a Nomological Network for the Understanding and Assessment of Emotions in Information Systems Research. J. Manag. Inf. Syst. 30, 13–48 (2014).

Measurement of Arousal when Using IS – An Overview on the State-of-the Art (BA)

Supervisor: Dr. Silvia Schacht

Problem Description: Today, many people perceive digital games as fun and engage themselves in even monotonous and repetitive tasks. Thus, organizations attempt to integrate gamification mechanisms as serious components in their information systems (IS) in order to motivate their employees and increase their performance. Thereby, the gamification mechanisms aim to stimulate certain arousals as key component of emotional responses within the user. In IS research, the concept of arousal is relatively unaddressed, "but is starting to get some attention because the emotional responses of consumers can potentially be influenced by the design of IT-based systems such as websites, games and virtual worlds." (Liu et al. 2013, p. 116)

Goal of the Thesis: This seminar thesis aims to provide an overview on the concept of arousal in IS research and psychology. Thereby, the seminar thesis should examine the measures of arousal (by using self-reported constructs, but also by using of physical measures) and its adaptability in the IS research context.

Starting Literature:

- Deng, L., Poole, M.S.: Affect in Web Interfaces: A Study if the Impacts of Web Page Visual Complexity and Order. MIS Quarterly. 34, 711–A10 (2010).
- Liu, D., Li, X., Santhanam, R.: Digital Games and Beyond: What Happens When Players Compete. MIS Quarterly. 37, 111–124 (2013).
- Gregor, S., Lin, A.C.H., Gedeon, T., Riaz, A., Zhu, D.: Neuroscience and a Nomological Network for the Understanding and Assessment of Emotions in Information Systems Research. J. Manag. Inf. Syst. 30, 13–48 (2014).

User Experience Engineering and Design Methods: A State-of-the-Art Overview (BA)

Supervisor: Xunahui Liu

Problem Description: Historically, usability engineering and associated methods focused on designing artefacts that prevent negative experiences of its users, the focus was set on task-centric efficiency, effectiveness, and satisfaction. In the last decade, the potential and importance of designing for positive experiences has been recognized and corresponding methods have been clustered under the umbrella of User Experience engineering & design.

Goal of the Thesis: The aim of this seminar thesis is to provide a comprehensive state-of-the-art overview and classification on existing methods focusing specifically on User Experience engineering and design.

Starting Literature:

- Vermeeren, A., Law, E., & Roto, V. (2010). User experience evaluation methods: current state and development needs. Proceedings: NordiCHI 2010, 521–530.
- Karapanos, W., Jain, J., & Hassenzahl, M. (2012). Theories, methods and case studies of longitudinal HCI research. Proceedings of the CHI EX 2012, 2727 – 2730.

Determinant of Multi-Channel Choice Behavior Across Different Stages of the Buying Process (BA)

Supervisor: Dennis Hummel

Problem Description: With the rise of new technologies, retailers and service provides are adding new channels to their distribution system and consumers now have the chance to browse for information, purchase the product, and use after-sales services in separate channels. This development poses the question under which circumstances consumers are using which channel in which stage of the buying process.

Goal of the Thesis: The aim of this seminar thesis is to examine which factors hamper or encourage the usage decision of a certain channel. Thereby, the factors should be clustered by the particular stage of the buying process.

Starting Literature:

- Balasubramanian, Sridhar, Rajagopal Raghunathan, and Vijay Mahajan. "Consumers in a multichannel environment: Product utility, process utility, and channel choice." Journal of interactive marketing 19.2 (2005): 12-30.
- Gensler, Sonja, Peter C. Verhoef, and Martin Böhm. "Understanding consumers' multichannel choices across the different stages of the buying process." Marketing Letters 23.4 (2012): 987-1003

What is Digital Service Experience (DSX)? (BA)

Supervisor: Dennis Hummel

Problem Description: Digital services are used and experienced by individuals every day, firms build whole business models on digital services and the widespread acceptance of new technologies is increasing the impact of digital services even more. Yet, there is no explicit definition of digital service experience and the term is often confused with customer experience, user experience or service experience. Yet, a definition is needed so that researchers and practioners are able to exchange views on the same matter and that the whole area can be enhanced.

Goal of the Thesis: This seminar thesis aims to define the term of digital service experience based on existing literature in the research community. Thereby, the student should not only focus narrowly on digital service experience itself but develop a broad view on the topic and dichotomize it from other terms.

Starting Literature:

- Zomerdijk, Leonieke G., and Christopher A. Voss. "Service design for experience-centric services." Journal of Service Research 13.1 (2010): 67-82.
- Teixeira, Jorge, et al. "Customer experience modeling: from customer experience to service design." Journal of Service Management 23.3 (2012): 362-376.

State-of-the-Art on Context Aware Recommendation Systems (CARSs) (BA)

Supervisor: Peyman Toreini

Problem Description: Recommender Systems have changed the way people find products, information, services, other people, etc. They help users to prevent an information overload problem by identifying relevant information for them. Using contextual information is one of the ways to improve recommender systems' performance and, therefore, the business performance.

Goal of the Thesis: The goals of this seminar thesis are: (1) Provide an overview of context-aware recommender systems research, and opportunities for future research. (2) Investigate and discuss empirical findings on how the context in recommendations affects crucial business-related performance measures.

Starting Literature:

- Adomavicius, Gediminas, and Alexander Tuzhilin. "Context-aware recommender systems." Recommender systems handbook. Springer US, 2011. 217-253.
- Panniello, Umberto, Michele Gorgoglione, and Alexander Tuzhilin. "In CARS We Trust: How Context-Aware Recommendations Affect Customers' Trust and Other Business Performance Measures of Recommender Systems."CARS. No. 2451/34278. 2015.

Pervasive Games - A Literature Review (BA)

Supervisor: Benedikt Morschheuser

Problem Description: Pervasive games are a new form of interactive and intelligent digital service system that utilize computer technology to provide interactive, ubiquitous and augmented playgrounds in the physical world.

Goal of the Thesis: Aim of this study is to conduct a systematic literature review on pervasive games and to identify patterns in the design and implementation of these systems

Starting Literature:

- Montola, M., Stenros, J., & Waern, A. (2009). Pervasive games: theory and design. Morgan Kaufmann Publishers Inc..
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining gamification. In Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments (pp. 9-15). ACM.
- Björk, S., & Peitz, J. (2007). Understanding pervasive games through gameplay design patterns. In Situated Play, Proceedings of DiGRA 2007 Conference (pp. 440-448).
- Davidsson, O., Peitz, J., & Björk, S. (2004). Game design patterns for mobile games. Project report to Nokia Research Center, Finland

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1	Bachelor Degree
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Overview on Ways to ‘Sense‘ a User to Invoke Assistance (MA)

Supervisor: Raphael Rissler

Problem Description: Users experience issues during their interactions with information systems (IS), due to insufficient knowledge on how to use these systems. These issues can result in frustration, since users make mistakes or are not able to fulfill their tasks at all. One possibility to address this issue is to provide real-time assistance to users when they require help . Thus, the assistance should automatically and intelligently react when users are facing an issue with the usage of the information system. Such intelligent reaction to users’ interaction is an ongoing topic in IS research. The availability of various physiological (e.g. heart rate) or behavioral (e.g. clickstream) measurements can be used for the generation of more accurate user models and thus, enable assistance systems to provide help when it is actually required.

Goal of the Thesis: The seminar thesis aims to provide an overview on research addressing physiological and behavioral measurements assessing users’ interaction with IS.

Starting Literature:

- Delisle, S., and Moulin, B. 2002. “User interfaces and help systems: From helplessness to intelligent assistance,” Artificial Intelligence Review (18:2), pp. 117–157
- Kabassi, K., and Virvou, M. 2015. “Combining decision-making theories with a cognitive theory for intelligent help: A comparison,” IEEE Transactions on Human-Machine Systems (45:2), pp. 176–186.

Cognitive-Oriented Decision Support Systems – An Integrated Framework for Designing Real-Time Business Intelligence (MA)

Supervisor: Mario Nadj

Problem Description: Recent technology advances have led to an unprecedented ability to collect and store data as well as to process high data velocities. Having greater access to data due to technological advancements is a benefit in principle. The flood of available data challenges the human being's ability to find what is informative or meaningful for its tasks. However, cognitive influencing factors are considered (at most) rudimentary in front-end designs of real-time Business Intelligence (RTBI) systems; we take these circumstances as the research motivation to create a cognitive-oriented design framework for RTBI systems based on extant Human Factors and Business Intelligence literature.

Starting Literature:

- Chen, H., Chiang, R. H. L, and Storey, V. C. 2012. "Business Intelligence and Analytics: From Big Data to Big Impact," MIS Quarterly (36:4), pp. 1165-1188.
- Goes, P. B. 2014. "Big Data and IS Research," MIS Quarterly (38:3), pp. iii-viii.

The Power of Velocity: A State-of-the-Art Classification Framework of Real-Time Business Intelligence Applications and Tools (MA)

Supervisor: Mario Nadj

Problem Description: Business Intelligence (BI) capitalized on data mining and analytics techniques for discovering trends. Nowadays businesses evolved to be more competitive and dynamic than the past, which demand for real-time BI and capability of making very quick decisions. Real-time BI (RTBI) shall analyze the data as soon it enters the organization. The latency (data latency, analysis latency, decision latency) shall be zero ideally. In order to establish such real-time BI systems, relevant technologies to guarantee low/zero latency are necessary. For example, real-time BI data warehouse techniques are able to provide fresh data access and update. The main approach is: system response time shall stay under a threshold that is less than the action taking time; and the rate of data processing shall be faster than the rate of data producing. However, there exist a handful of real-time data mining algorithms in theoretical fields, but their applicability and suitability towards various real-time applications are still fuzzy; we take these circumstances as the research motivation to analyze existing RTBI applications along different characteristics bases on extant academic and practitioner literature.

Starting Literature:

- Chen, H., Chiang, R. H. L, and Storey, V. C. 2012. “Business Intelligence and Analytics: From Big Data to Big Impact,“ MIS Quarterly (36:4), pp. 1165-1188.
- Goes, P. B. 2014. “Big Data and IS Research,” MIS Quarterly (38:3), pp. iii-viii.

Selecting User-Centered Design Methods: The Importance of Context (MA)

Supervisor: Xunahui Liu

Problem Description: A large number of user-centered design (UCD) methods exists. Therefore, selecting an appropriate UCD method when designing a product or service is challenging. Typically, the selection is context-dependent and many factors may influence the selection decision: skills and experience of the designer, maturity of the product/service, resource and budget constraints, dependencies between methods, etc.).

Goal of the Thesis: The goal of this seminar thesis is to conduct a structured literature review to develop a comprehensive overview and classification of contextual factors that may influence the selection of a UCD method when designing a product or service in general. Specifically, the thesis should emphasize on digital services (aka software) design and development. Existing related work on contextualizing software development should be generalized and mapped to the more specific UCD focus.

Starting Literature:

- http://philippe.kruchten.com/2009/07/22/the-context-of-software-development/, see also http://queue.acm.org/detail.cfm?id=1281893
- http://ceur-ws.org/Vol-618/paper1.pdf
- http://www2.it.lut.fi/project/RIGHT/publications/bern-et.al.pdf.

Utilizing Big Data Analytics in Team Research – A Systematic Literature Review (MA)

Supervisor: Karl Werder

Problem Description: Within this seminar work, the student will learn to conduct a systematic literature review. Therefore, he/she will have to define key concepts, develop and execute a rigorous search strategy. The result will be an overview of the state-of-the art research on the use of big data within team research. The student is expected to provide an overview of the identified studies with their main data source and a list of constructs used with their respective operationalization.

Starting Literature:

- Müller, O., Junglas, I., vom Brocke, J., & Debortoli, S. (2016). Utilizing big data analytics for information systems research: challenges, promises and guidelines. European Journal of Information Systems.
- Kozlowski, S. W., Chao, G. T., Chang, C. H., & Fernandez, R. (2016). Team dynamics: Using “big data” to advance the science of team effectiveness. Big data at work: The data science revolution and organizational psychology. New York, NY: Routledge Academic.
- Anderson, J. C., & Gerbing, D. W. (1982). Some methods for respecifying measurement models to obtain unidimensional construct measurement. Journal of marketing research, 453-460.

Performance Measurement Systems – A State-of-the-Art Systematic Literature Review (MA)

Supervisor: Karl Werder

Problem Description: The seminar work provides a chance to dive into the process of conducting a systematic literature review. Therefore, the student will define key concepts and familiarize himself/herself with performance management systems in the context of product development. As a result, the student proposes a new taxonomy.

Starting Literature:

- Bititci, U. S., Carrie, A. S., & McDevitt, L. (1997). Integrated performance measurement systems: a development guide. International journal of operations & production management, 17(5), 522-534.
- Kueng, P., Meier, A., & Wettstein, T. (2001). Performance measurement systems must be engineered. Communications of the Association for Information Systems, 7(1), 3.
- Nickerson, R. C., Varshney, U., & Muntermann, J. (2013). A method for taxonomy development and its application in information systems. European Journal of Information Systems, 22(3), 336-359.

Deep Learning Applications: State-of-the-Art Overview and Pros & Cons Analysis (MA)

Supervisor: Peyman Toreini

Problem Description: Deep learning algorithms follow a hierarchical learning process and automatically extract high-level, complex data abstractions. These techniques have shown promising results when dealing with learning from large amounts of unsupervised data, e.g. in the application fields of speech recognition, visual object recognition or object detection. However, in contrast to traditional approaches, deep learning algorithms are often characterized as “black-box” methods that for example are not able to provide any explanation to users. Thus, it is interesting to get a deeper understanding of pros and cons of using deep learning algorithms in applications.

Goal of the Thesis: The goals of this seminar thesis are twofold: (1) Provide an overview of current key application areas of deep learning and (2) Carry out a pros & cons analysis of applying deep learning algorithms in contrast to other existing algorithms.

Starting Literature:

- Bengio, Yoshua. "Learning deep architectures for AI." Foundations and trends® in Machine Learning 2.1 (2009): 1-127.
- LeCun, Yann, Yoshua Bengio, and Geoffrey Hinton. "Deep learning." Nature521.7553 (2015): 436-444.
- Deng, Li, and Dong Yu. "Deep learning: Methods and applications."Foundations and Trends in Signal Processing 7.3–4 (2014): 197-387.

Why do People Participate in Crowdsourcing Systems – A Literature Review (MA)

Supervisor: Benedikt Morschheuser

Problem Description: Crowd-based intelligence is an essential component of many intelligent service systems. Many user dedicate their time and effort to work and share data in crowdsourcing approaches. But what motivates people to participate in crowdsourcing?

Goal of the Thesis: Aim of this study is to conduct a systematic literature review on motivation in crowdsourcing and to identify and cluster factors and features that have been found in previous research .

Starting Literature:

- Brabham, D. C. (2008) Moving the crowd at iStockphoto: The composition of the crowd and motivations for participation in a crowdsourcing application by, First Monday 13(6).
- Brabham, D. C. (2010) Moving the crowd at threadless, Information, Communication & Society 13(8): 1122–1145.
- Kaufmann, N., Schulze, T. and Veit, D. (2011) More than fun and money. Worker Motivation in Crowdsourcing - A Study on Mechanical Turk, in Proceedings of the 17th Americas Conference on Information Systems - AMCIS, Detroit, Michigan, USA: AIS. 1–11.
- Leimeister, J. M., Huber, M., Bretschneider, U. and Krcmar, H. (2009) Leveraging Crowdsourcing: Activation-Supporting Components for IT-Based Ideas Competition, Journal of Management Information Systems 26(1): 197–224.
- Zhao, Y. and Zhu, Q. (2014a) Evaluation on crowdsourcing research: Current status and future direction, Information Systems Frontiers 16(3): 417–434.
- Zhao, Y. and Zhu, Q. (2014b) Effects of extrinsic and intrinsic motivation on participation in crowdsourcing contest, Online Information Review 38(7): 896–917.
- Zheng, H., Li, D. and Hou, W. (2011) Task Design, Motivation, and Participation in Crowdsourcing Contests, International Journal of Electronic Commerce 15(4): 57–88.