HCSE 2014

5th International Conference on Human-Centered Software Engineering

Conference Program
Paderborn, Germany
September 16th – 18th

ifip

WG 13.2 Methodologies for
User-Centered Systems Design

Table of Contents

Foreword

Dear Participants,
Welcome to HCSE 2014 in Paderborn!

Innovative and networked computer technologies decisively enriched the way people are interacting today. Especially the mobility of people – always being on the way – created completely new scopes for software development using new kinds of devices and new kinds of user interfaces. Usability has been recognized as an important quality aspect in today's system development industry. However, the integration of usability activities and the establishment of human-centered design methodologies as part of the development lifecycle is still a challenge.

IFIP WG 13.2 is one of the five working groups of IFIP TC 13 (Technical Committee on Human Computer Interaction) of the IFIP (International Federation for Information Processing). This working group provides an umbrella for academia researchers, students and industry practitioners, who have an interest in fundamental theory, practices and technology related to the user-centered design philosophy.
The main goal of the IFIP WG 13.2 "Methodologies for User-Centered Systems Design" is to promote fundamental research and improve the practices of the user-centered systems design and engineering philosophy. While HCI research has made considerable progress on analysis and design methods for interactive systems, industrial and software engineering practices of HCI have been less successful. The working group has a significant role in bridging the gaps between HCI and the software development communities.

HCSE 2014 is the 5th edition of a bi-annual conference series promoted by IFIP WG 13.2. This year, we received an impressive selection of submissions from which we compiled an interesting technical program that covers a broad range of late-breaking and challenging research and development topics in the intersection of HCI, human-centered design, and software engineering. Among the addressed topics are adaptive and context-dependent applications, user involvement, improved usability, agile development and HCSE process integration, the use and reuse of models and development artifacts, etc.

Furthermore, we can proudly announce two outstanding keynote speeches by Margaret Burnett and Wil van der Aalst.

I hope that you enjoy the conference and have a great time in Paderborn while attending HCSE 2014!

Stefan Sauer
General Chair

and the entire organizing team

Sponsoring

Many thanks to our sponsoring partners who make the conference possible and also allow us to open both keynotes for free for interested local researchers and practitioners!

Platinum Sponsors

The mission of "Paderborn überzeugt." is to promote the attractiveness and image of our city to attract key players to the Paderborn area and keep them here. We are pursuing this goal mainly by:

- *Supporting the City of Paderborn in initiatives and projects that strengthen its economic position and promote its image*
- *Using all kinds of media for marketing activities*
- *Supporting public relations campaigns and events that highlight the region's economic, academic, cultural strengths and sports activities*
- *Cooperating with other associations and institutions in projects that promote the Paderborn area*

The close cooperation between science and industry is a key success factor in the transfer of research results into marketable innovations. To intensify this collaboration the University of Paderborn, technology companies and the Fraunhofer IPT Project Group Mechatronic Systems Design have the Software Innovation Campus Paderborn, short SICP.
Research at SICP is interdisciplinary and transorganizational and targets software innovations of the future!

The s-lab - Software Quality Lab is the center of competence in software engineering at the University of Paderborn. It was founded in 2005 by professors of the department of computer science to carry out joint research and development projects together with industrial partners on up-to-date and relevant topics of software development and software quality assurance.

Gold Sponsors

Silver Sponsors

Scientific Supporters

Quick Information

WLAN/ Internet Access	You will receive a login for the guest WLAN of the Heinz Nixdorf MuseumsForum at the conference registration desk. In some parts of the building, the education roaming network "eduroam" is also available. It is provided by the University of Paderborn. All people with a certificate for "eduroam" may use this network.
Catering/ Lunch	You will get some coffee, tea, cold beverages and snacks in the conference rooms. Every participant will also get vouchers for the lunch on Tuesday, Wednesday and Thursday together with the conference bag. You can use these vouchers in the restaurant "Hotspot" in the basement of the Heinz Nixdorf MuseumsForum. Special tables will be reserved in the sitting area behind the checkout.
Welcome Reception	There will be a welcome reception on Tuesday starting directly after the museum tours in the 2nd floor of the Zukunftsmeile around 6 p.m. The Zukunftsmeile is the black building 100 meter on the right side of the Heinz Nixdorf MuseumsForum when you are leaving it.
Conference Banquet	The conference banquet will be held in the "Klosterwirtshaus Dahlheim". We have organized a special bus transfer because the venue is outside of Paderborn. The bus will start in front of the Heinz Nixdorf MuseumsForum at 5:45 p.m. We will return from the banquet with our bus shuttle at 10:30 p.m. Multiple stops close to the hotels are organized.
Conference Office	The conference office will be open from 8:30 a.m. every day. It is located at the left-hand side of the front desk when entering the Heinz Nixdorf MuseumsForum.
Printed Proceedings	Additional copies of printed proceedings are available for purchase at the conference office.
Digital Proceedings	All conference participants may download a free digital copy of the conference proceedings. The free access will expire four weeks after the conference and will only be available entering the publisher website using the following link: http://hcse2014.uni-paderborn.de/program/proceedings.html

Agenda 2014

Tuesday, September 16th

08:30 - 09:00	Registration
09:00 - 09:15	Opening
09:15 - 10:30	Keynote by Wil van der Aalst
10:30 - 11:00	Refreshment Break
11:00 - 12:30	S01: Integrating HCSE Processes
12:30 - 14:00	Lunch Break
14:00 - 15:30	S02: Building Adaptive Systems
15:30 - 16:00	Refreshment Break
16:00 - 18:00	HNF Museum Tours
18:00 - 19:30	Welcome Reception

Keynote by Wil van der Aalst

How People Really (Like To) Work: Comparative Process Mining To Unravel Human Behavior

Software forms an integral part of the most complex artifacts built by humans. Communication, production, distribution, healthcare, transportation, banking, education, entertainment, government, and trade all increasingly rely on systems driven by software. Such systems may be used in ways not anticipated at design time as the context in which they operate is constantly changing and humans may interact with them an unpredictable manner. However, at the same time, we are able to collect unprecedented collections of event data describing what people and organizations are actually doing. Recent developments in process mining make it possible to analyze such event data, thereby focusing on behavior rather than correlations and simplistic performance indicators. For example, event logs can be used to automatically learn end-to-end process models. Next to the automated discovery of the real underlying process, there are process mining techniques to analyze bottlenecks, to uncover hidden inefficiencies, to check compliance, to explain deviations, to predict performance, and to guide users towards "better" processes. Process mining reveals how people really work and often reveals what they would really like to do. Event-based analysis may reveal workarounds and remarkable differences between people and organizations. In his keynote, Wil van der Aalst

highlights current research on comparative process mining. One can compare event data with normative process models and see where people deviate. Some of these deviations may be positive and one can learn from them. Other deviations may reveal inefficiencies, design flaws, or even fraudulent behavior. One can also use process cubes to compare different systems or groups of people. Through slicing, dicing, rolling-up, and drilling-down we can view event data from different angles and produce process mining results that can be compared.

Prof.dr.ir. Wil van der Aalst is a full professor of Information Systems at the Eindhoven University of Technology (TU/e).

More information: http://wwwis.win.tue.nl/~wvdaalst

Session 01: Integrating HCSE Processes

✪ *Session Chair: FABIO PATERNÓ*

Extending OpenUP to Conform with the ISO Usability Maturity Model (Full Paper)
⊙ ANDRÉS RODRÍGUEZ

Usability Engineering in the Wild: How Do Practitioners Integrate Usability Engineering in Software Development? (Full Paper)
⊙ NIS BORNOE, JAN STAGE

An Autoethnographic Study of HCI Effort Estimation in Outsourced Software Development (Full Paper)
⊙ SHALAKA DIGHE, ANIRUDHA JOSHI

Session 02: Building Adaptive Systems

✪ *Session Chair: PETER FORBRIG*

Understanding End-User Development of Context-dependent Applications in Smartphones (Full Paper)
⊙ GABRIELLA LUCCI, FABIO PATERNÒ

Dynamic Interaction Plug-ins Deployment in Ambient Spaces (Full Paper)
⊙ BASHAR ALTAKROURI, ANDREAS SCHRADER

LiLoLe – A Framework for Lifelong Learning from Sensor Data Streams for Predictive User Modeling (Full Paper)
⊙ MIRKO FETTER, TOM GROSS

HNF Museum Tours

The Heinz Nixdorf MuseumsForum is the world's largest computer museum, as well as a vibrant venue. The 5,000-year history, present and future of information

technology is depicted over 6,000 m² of floor space, from the origins of numbers and characters in 3,000 B.C. all the way to the computer age of the 21st century. The 2,000-plus objects on show are presented within the broad context of social and economic history, making the exhibition appealing to laymen and computer experts alike. The extensive offering of events in the MuseumsForum complements the exhibition. Lectures, workshops and conferences focus on aspects of the far-reaching influence exerted by information technologies on both man and society at large. Thus the remit of the HNF is to address the issues of man's guidance and education in the present-day information society.

The Heinz Nixdorf MuseumsForum is sponsored by the Stiftung Westfalen, founded by Heinz Nixdorf himself. This concentrates on promoting science and teaching, especially in the field of information technology.

We have organized two guided tours through the exhibition of the museum, which will start in the foyer at 4 p.m. and 4:15 p.m. One tour will be held in English and one in German. Due to the limited places for a tour, we kindly ask the German speaking people to join the German tour.
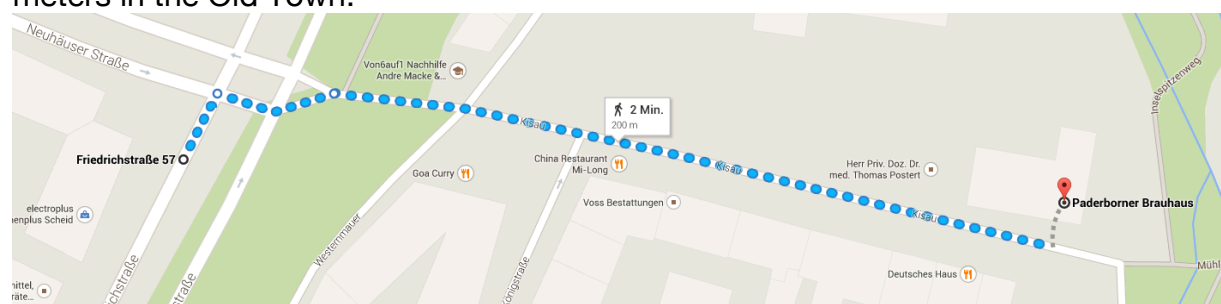

Picture Credits: Jan Braun / HNF

Welcome Reception

After the guided museum tours, we will have a welcome reception with some drinks and snacks in the Zukunftsmeile, the black building next door. When you leave the building turn to the right and walk about 100 meters over the skywalk to the black building. There you will enter the building on the 1st level. Use the elevator or the staircases up to 2nd level and join us for the welcome reception.

We will also make a reservation in the "Paderborner Brauhaus" (Address: Kisau 2) – a restaurant in the city center – for 8 p.m. for all those participants who would like to meet for dinner. All dishes and drinks in the restaurant are on your own account. To join us there, you may use the bus line 11 back to the city center and leave the bus at the stop "Neuhäuser Tor". Cross the street at the traffic lights and walk about 200 meters in the Old Town.

Wednesday, September 17th

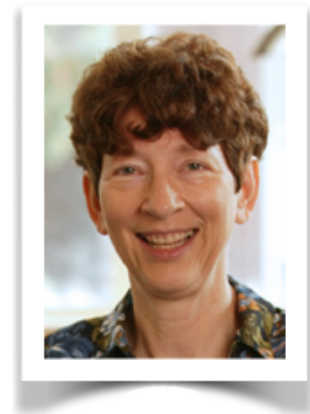|	
09:00 - 10:30	Keynote by Margaret Burnett
10:30 - 11:00	Refreshment Break
11:00 - 12:30	S03: Considering Humans
12:30 - 14:00	Lunch Break
14:00 - 15:30	S04: Improving Usability
15:30 - 16:00	Refreshment Break
16:00 - 17:30	UX Session
18:00 - 22:00	Conference Banquet

Keynote by Margaret Burnett

End-User Software Engineering: Beyond the Silos

End-user programming has become pervasive in our society, with end users programming simulations, courseware, spreadsheets, macros, mashups, and more. In this talk, we will consider what happens when we add to end-user programming environments consideration of the software lifecycle beyond the "coding" phase. Considering other phases is necessary, because there is ample evidence that the programs end users create are filled with errors. To help address this problem, we have been working on a software "engineering" methodology designed specifically for end users.

Because the user may have no expertise or even interest in software engineering, we do not propose to transform end users into engineers. Rather, our approach is to tightly integrate elements of design, implementation, component integration, debugging, testing, and maintenance, supported behind the scenes by analysis and inferential reasoning, to help the user reason about the dependability of their software as they work with it, in a manner that respects the user's problem-solving directions to an extent unprecedented in existing software development environments.

In this talk, we describe the present state of EUSE, and challenges in moving forward. We show the challenges of avoiding becoming over-siloed. We then show that focusing on the in-the-moment intents of end-user developers can be used to derive a number of promising directions forward for EUSE researchers, and how theories can help us further de-silo future EUSE research. Finally, we discuss how overcoming challenges for the future of end-user software engineering may also bring direct benefits to the future of "classic" software engineering.

Prof. Dr. Margaret Burnett is a full professor for Computer Science in the School of EECS at Oregon State University.

More information: http://eecs.oregonstate.edu/people/burnett

Session 03: Considering Humans

✪ *Session Chair: Marta Lárusdóttir*

Creating and Using Personas in Software Development: Experiences from Practice (Short Paper)
⊙ Jane Billestrup, Jan Stage, Anders Bruun, Lene Nielsen, Kira Storgaard Hansen

Seeding the Design Process for Future Problems (Short Paper)
⊙ Peter Newman, Stephen Forshaw, Maria Angela Ferrario, Will Simm, Adrian Friday, Jon Whittle

To Trust or not to Trust – Six Recommendations for System Feedback in a Dynamic Environment (Full Paper)
⊙ Alexander G. Mirnig, Elke Beck, Sandra Trösterer, Manfred Tscheligi

Aspects of Human-centred Design in HCI with Older Adults: Experiences from the Field (Short Paper)
⊙ Ana Correia de Barros, Rêgo Sílvia, Antunes João

User Centered Inclusive Design for People with Dyslexia: Experiences from a Project on Accessibility (Short Paper)
⊙ Dominik Rupprecht, Rainer Blum, Birgit Bomsdorf

Session 04: Improving Usability

✪ *Session Chair: Philippe Palanque*

Active Collaborative Learning: Supporting Software Developers in Creating Redesign Proposals (Full Paper)
⊙ Anders Bruun, Janne Jul Jensen, Mikael Skov, Jan Stage

Usage-based Automatic Detection of Usability Smells (Full Paper)
⊙ Patrick Harms, Jens Grabowski

On the Delivery of Recommendations in Social Software: A User's Perspective (Short Paper)
⊙ Nan Jiang, Raian Ali

Usability of Single- and Multi-Factor Authentication Methods on Tabletops: A Comparative Study (Short Paper)
⊙ Anders Bruun, Kenneth Jensen, Dianna Kristensen

UX Session

✪ *Session Chair: Regina Bernhaupt*

The user experience session allows the attendees of HCSE to develop conference content in a user-centered way. Goal is to have a panel that is developed during the conference: the topic is chosen by the HCSE participants using theme cards and the panel participants are elected by all conference attendees. Theme cards and voting cards will be found in your conference bag.

Conference Banquet

After a long day with great talks and lots of new impressions, we will encourage the social networking and personal discussions on our second conference day during the conference banquet. Therefore, we will start around 5:45 p.m. with our bus shuttle directly in front of the Heinz Nixdorf MuseumsForum to the 'Klosterwirtshaus Dahlheim', an old convent with its own little beer brewery.

Reopened in 2007, the historical convent area and the inn will let you feel 500 years of monastery history and you will sit directly in it. The old area also includes a late Gothic church, some stables, a mill, a forge as well as several gardens and ponds.

Picture Credits: Klosterwirtshaus Dahlheim / Stiftung KOLPING-FORUM Paderborn

We will leave Kloster Dahlheim with the bus shuttle at 10:30 p.m. On the way back, the bus will stop on different locations in Paderborn close to the hotels.

Bus stop	Hotels
Detmolder Tor	IN VIA Hotel
Neuhäuser Tor	Ibis Paderborn City, Hotel Zur Mühle, Best Western Premier Arosa Hotel
Central Railway Station	B&B Hotel
Fürstenweg	Welcome Hotel
MuseumsForum	Conference parking lot
Please tell us if you are staying in a different hotel. We will try to arrange another stop.	

Thursday, September 18ᵗʰ

09:00 - 10:30	S05: Building on Models
10:30 - 11:00	Refreshment Break
11:00 - 12:30	S06: Introducing Agile Development
12:30 - 12:45	Conference Closing
12:45 - 14:00	Lunch Break
14:00 - 15:30	IFIP WG 13.2 Meeting (open)
16:30 - 18:00	City Tours
19:00 - 22:00	Farewell Drinks (on your own account)

Session 05: Building on Models

✪ *Session Chair: CRISTIAN BOGDAN*

Rapid Task-Models Development using Sub-models, Sub-routines and Generic Components (Full Paper)
⊙ PETER FORBRIG, CÉLIA MARTINIE, PHILIPPE PALANQUE, MARCO WINCKLER, RACIM FAHSSI

CASSIS: A Language for Reusable User Interface Designs (Short Paper)
⊙ JAN VAN DEN BERGH, KARIN CONINX

Bridging User Context and Design Models to Build Adaptive User Interfaces (Full Paper)
⊙ MLADAN JOVANOVIĆ, STARCEVIC DUSAN, ZORAN JOVANOVIC

Model-based Development of Adaptive UIs for Multi-Channel Self-Service Systems (Short Paper)
⊙ ENES YIGITBAS, HOLGER FISCHER, THOMAS KERN, VOLKER PAELKE

Session 06: Introducing Agile Development

✪ *Session Chair: MARCO WINCKLER*

Continuous Improvement in Agile Development Practice – The Case of Value and Non-Value Adding Activities
(Full Paper)
⊙ MARTA KRISTIN LÁRUSDÓTTIR, ÅSA CAJANDER, MICHAEL SIMADER

Integrating Agile Development Processes and User Centered Design – A Place for Usability Maturity Models?

(Full Paper)
⊙ Dina Salah, Richard Paige, Paul Cairns

Human Centricity in Agile: Perceptions from the Fields of HCI and Marketing (Short Paper)
⊙ Leydi Caballero, Ana M. Moreno, Ahmed Seffah

Improving UX Work in Scrum Development: A Three-Year Follow-Up Study in a Company (Short Paper)
⊙ Kati Kuusinen

City Tours & Farewell Drinks

"Situated at the heart of Germany, midway between the Northern Lowlands and the mountainous central region, the charming city of Paderborn is full of many diverse and delightful attractions.
The city's wider community extends across eastern North-Rhine Westphalia and encompasses a catchment area of half a million people, the majority of whom live in the more rural outlying villages. There are 146,400 inhabitants (as recorded in July 2014) living within the city, many of which moved to Paderborn during the last thirty years.
The city has numerous qualities to tempt the visitor. With over 1200 years of history to its credit, it is steeped in historical tradition, which has shaped the cityscape. The many parks and green spaces beginning right by the shopping precinct at Pader Springs are much appreciated by city-dwellers and visitors alike. Despite the recent modernization and expansion of the city, it remains a user-friendly place that can be easily navigated. In comparison with other cities, inhabitants have only a short distance to travel from home to work. Paderborn's appeal thus lies in the combination of many different qualities. Ancient and modern, sacred and spiritual, economic and political are all combined, each contributing to the city's distinctive character."

We have organized a guided city tour through Paderborn. Therefore, we will meet in the city center in front of the Paderhalle (Address: Heiersmauer 45). You may take bus line 11 until the stop "Neuhäuser Tor" and either walk from there or you may take bus line 6, 28 or 68 on the other side of the street and go one stop until "Maspernplatz". The Paderhalle is the big building on your right side.

After the city tour we will have some farewell drinks in a location nearby.

Picture Credits: Holger Fischer / s-lab – Software Quality Lab

Restaurants

Restaurants in the city

CAFES + BISTROS

La Maison
Rosenstr. 13-15, Tel. 0 52 51 / 8 78 62 80
www.lamaison-paderborn.de

Café-Restaurant Ostermann am Marienplatz
Marienplatz 6-8, Tel. 0 52 51 / 20 78 23
www.cafe-ostermann.de

Café-Restaurant Ostermann am Dom
Markt 4, Tel. 0 52 51 / 8 77 39 44
www.cafe-ostermann.de

Café-Bistro Ostermann am Museum
Markt 17, Tel. 0 52 51 / 8 78 74 88
www.cafe-ostermann.de

Caféhaus & Bistro Plückebaum
Am Abdinghof 32, Tel. 0 52 51 / 2 77 44
www.cafe-plueckebaum.de

Tee und Café Stübchen
Bachstr. 1, Tel. 0 52 51 / 12 24-0
www.galerie-hotel.de

RESTAURANTS

Restaurant im Hotel Aspethera
Am Busdorf 7, Tel. 0 52 51 / 28 88-100
www.hotel-aspethera.de

Restaurant Balthasar
Warburger Str. 28, Tel. 0 52 51 / 2 44 48
www.restaurant-balthasar.de

Restaurant „Chalet" im Best Western Premier Arosa Hotel
Westernmauer 38, Tel. 0 52 51 / 1 28-0
www.arosa-paderborn.de

Deutsches Haus
Kisau 9, Tel. 0 52 51 / 2 21 36
www.gaumenfreude.info

Bar Trattoria Il Postino
Jühenplatz 1-3, Tel. 0 52 51 / 29 61 70
www.trattoria-ilpostino.de

SERGIO espresso & wine bar
Jühenplatz 1-3, Tel. 0 52 51 / 1 47 68 45
www.espressobar-sergio.de

Kampus Café - Bar - Restaurant
Kamp 12, Tel. 0 52 51 / 89 29 797
www.gaumenfreude.info

Café-Restaurant Klingenthal
Westernstr. 22-24, Tel. 0 52 51 / 2 86-0
www.klingenthal.com

Der Kupferkessel
Restaurant - Wein- und Bierbar
Marienstr. 14, Tel. 0 52 51 / 2 36 85
www.kupferkessel-paderborn.de

La Petite Galerie
Bachstr. 1, Tel. 0 52 51 / 12 24-0
www.galerie-hotel.de

Libori-Eck
Liboristr. 5, Tel. 0 52 51 / 2 52 45
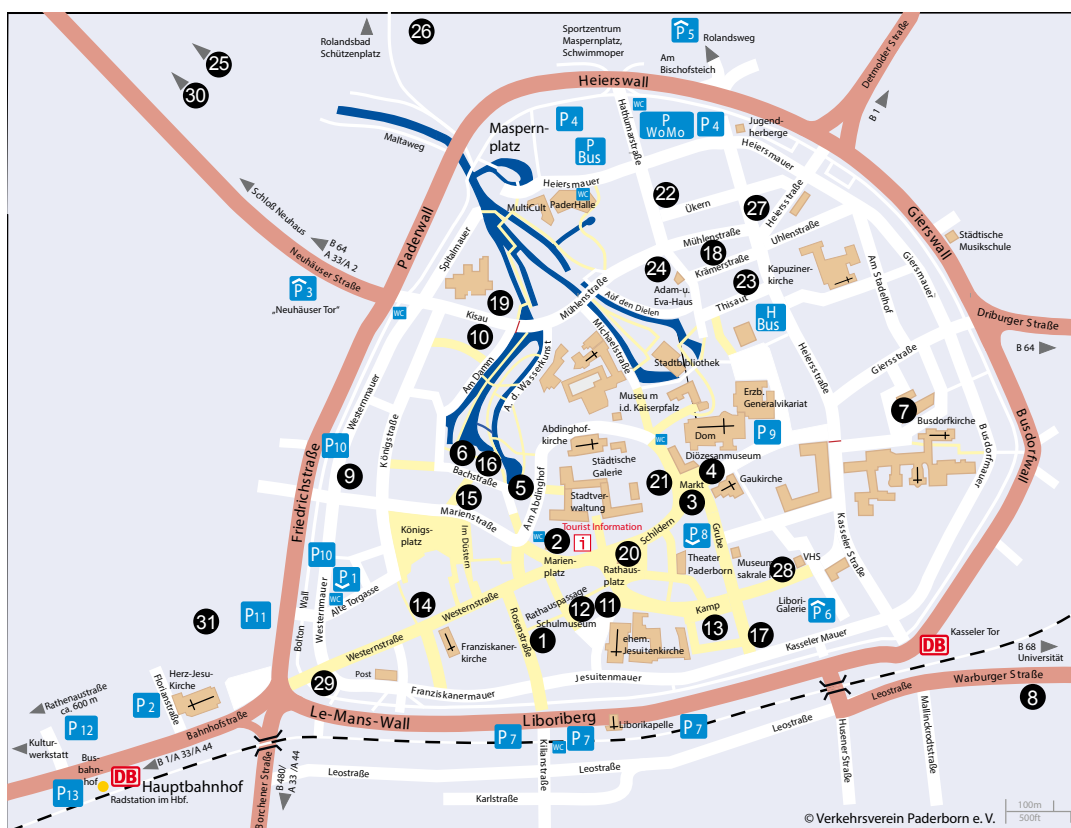www.libori-eck.de

Orangerie - Café-Bistrorant
Mühlenstr. 6, Tel. 0 52 51 / 8 78 48 86
www.orangerie-paderborn.de

Paderborner Brauhaus
Kisau 2, Tel. 0 52 51 / 28 25 54
www.gaumenfreude.info

Restaurant Ratskeller
Rathausplatz 1, Tel. 0 52 51 / 20 11 33
www.ratskeller-paderborn.de

ROAD HOUSE downtown
Markt 9, Tel. 0 52 51 / 8 77 11 42
www.roadhouse-downtown.de

Restaurant im Hotel StadtHaus
Hathumarstr. 22 / Ükern 1
Tel. 0 52 51 / 1 88 99-10
www.hotel-stadthaus.de

Thi-Brunnen
Thisaut 4, Tel. 0 52 51 / 2 22 15

Restaurant Weinkrüger
Hathumarstr. 9, Tel. 0 52 51 / 2 77 01
www.weinhaus-weinkrueger.de

Restaurant „Paderaue" im Welcome Hotel Paderborn
Fürstenweg 13, Tel. 0 52 51 / 28 80-0
www.welcome-hotel-paderborn.de

Schützenhof Paderborn
Restaurant - Säle - Biergarten
Schützenplatz 1, Tel. 0 52 51 / 15 62-0
www.schuetzenhof.de

PUBS + BARS

Blauer Engel
Heiersstr. 33, Tel. 01 60 / 90 70 98 99
www.blauer-engel.com

Feuerstein
Kamp 31, Tel. 0 52 51 / 29 10 60

Der KUMP
Am Westerntor 1, Tel. 0 52 51 / 2 75 82
www.kump-paderborn.de

Gaststätte „Plückers" im Welcome Hotel Paderborn
Fürstenweg 13, Tel. 0 52 51 / 28 80-0
www.welcome-hotel-paderborn.de

Riemeke-Eck
Fürstenbergstr. 1, Tel. 0 52 51 / 29 11 36
www.riemeke-eck.de

More information on the above-mentioned restaurants as well as other restaurants outside of the inner city can be found on our website:
www.paderborn.de/tourismus

paderborn.de
Paderborn
überzeugt.

Locations

1. La Maison
2. Café-Restaurant Ostermann am Marienplatz
3. Café-Restaurant Ostermann am Dom
4. Café-Bistro Ostermann am Museum
5. Caféhaus & Bistro Plückebaum
6. Tee und Café Stübchen
7. Restaurant im Hotel Aspethera
8. Restaurant Balthasar
9. Restaurant „Chalet" im Best Western Premier Arosa Hotel
10. Deutsches Haus
11. Bar Trattoria Il Postino
12. SERGIO espresso & wine bar
13. Kampus Café - Bar - Restaurant
14. Café-Restaurant Klingenthal
15. Der Kupferkessel
16. La Petite Galerie
17. Libori-Eck
18. Orangerie
19. Paderborner Brauhaus
20. Restaurant Ratskeller
21. ROAD HOUSE downtown
22. Restaurant im Hotel StadtHaus
23. Thi-Brunnen
24. Restaurant Weinkrüger
25. Restaurant „Paderaue" im Welcome Hotel Paderborn
26. Schützenhof Paderborn
27. Blauer Engel
28. Feuerstein
29. Der KUMP
30. Gaststätte „Plückers" im Welcome Hotel Paderborn
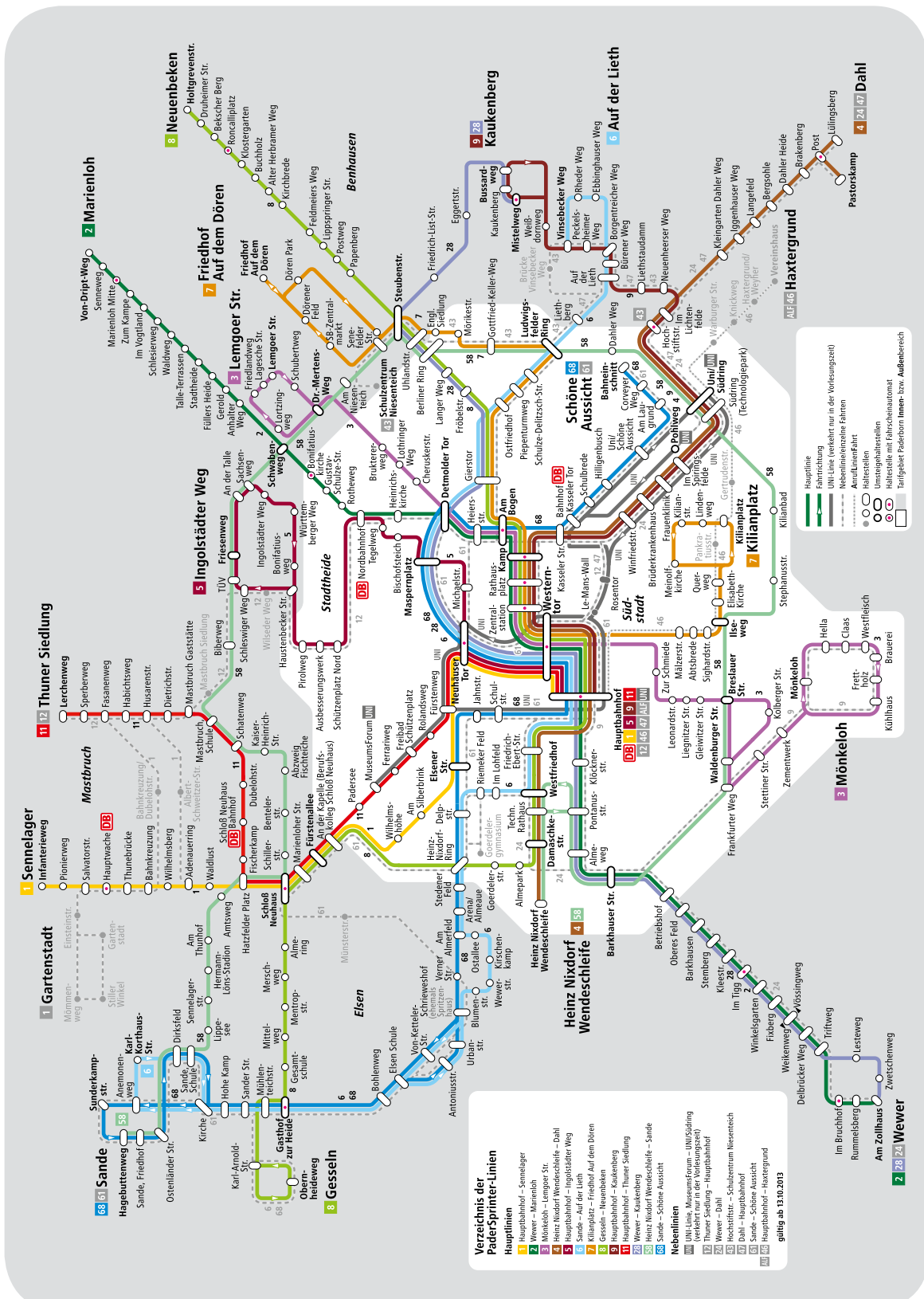31. Riemeke-Eck

© Verkehrsverein Paderborn e. V.

Area Map

Public Bus Transportation

Starting at the central railway station ("Hauptbahnhof") take bus line 11 towards "Schloss Neuhaus / Thuner Siedlung" until the bus stop "MuseumsForum". The bus line goes every 30 minutes and will take around 9 minutes for a ride.

11 Hauptbahnhof → Freibad/Schützenplatz → MuseumsForum → Schloß Neuhaus → Mastbruch → Thuner Siedlung

MONTAG BIS FREITAG

🚌 Linie 1 (Sennelager) departures marked with **1**

Stunde	4	5	6	7	8-18	19	20	21-22	23
Hauptbahnhof	44	32	02 32 37	00 16 32 46	02 16 32 46	02 16 45	08 16 47	16 47	17
Westerntor	46	34	05 35 39	03 18 35 48	05 18 35 48	05 18 47	10 18 49	18 49	19
Neuhäuser Tor	47	35	07 37 41	05 20 37 50	07 20 37 50	07 20 48	11 20 50	20 50	20
Fürstenweg	48	36	08 38 42	06 21 38 51	08 21 38 51	08 21 49	12 21 51	21 51	21
Rolandsweg			43	22 52	22 52	22	22	22	
Freibad/Schützenplatz			44	23 53	23 53	23	23	23	
Ferrariweg			45	24 54	24 54	24	24	24	
MuseumsForum			46	25 55	25 55	25	25	25	
Padersee			47	26 56	26 56	26	26	26	
An der Kapelle	52	40	13 43 48	11 27 43 57	13 27 43 57	13 27 53	16 27 55	27 55	25
Fürstenallee	53	41	14 44 49	12 28 44 58	14 28 44 58	14 28 54	17 28 55	28 55	25
Marienloher Straße	54	42	15 45 50	13 29 45 59	15 29 45 59	15 29 55	18 29 56	29 56	26
Schloß Neuhaus	55	43	16 46 51	14 30 46 00	16 30 46 00	16 30 56	19 30 57	30 57	27
Hatzfelder Platz	56	44	17 47 52	15 31 47 01	17 31 47 01	17 31 57	20 31 57	31 57	27
Schloß Neuhaus Bahnhof			53	32 02	32 02	32	32	32	
Dubelohstraße			54	33 03	33 03	33	33	33	
Schatenweg			56	35 05	35 05	35	35	35	
Mastbruch Schule			57	36 06	36 06	36	36	36	
Mastbruch Gaststätte			58	37 07	37 07	37	37	37	
Dietrichstraße			59	38 08	38 08	38	38	38	
Husarenstraße			00	39 09	39 09	39	39	39	
Habichtsweg			00	39 09	39 09	39	39	39	
Fasanenweg			01	40 10	40 10	40	40	40	
Sperberweg			01	40 10	40 10	40	40	40	
Lerchenweg			02	41 11	41 11	41	41	41	

1 Linie 1 (Sennelager)

11 Thuner Siedlung → Mastbruch → Schloß Neuhaus → MuseumsForum → Freibad/Schützenplatz → Hauptbahnhof

MONTAG BIS FREITAG

🚌 badges: **1**, **A**, **B**

Stunde	5	6	7	8-19	20-22	23
Lerchenweg		18	17 47	03 13 47	17 47	47
Sperberweg		19	18 48	04 14 48	18 48	48
Fasanenweg	11	20 07	19 49	05 15 49	19 49	49
Habichtsweg	11	20 07	19 49	05 15 49	19 49	49
Husarenstraße	12	21 08	20 50	06 16 50	20 50	50
Dietrichstraße		22	21 51	07 17 51	21 51	51
Mastbruch Gaststätte		23	22 52	08 19 52	22 52	52
Mastbruch Schule		24	23 53	09 20 53	23 53	53
Schatenweg		25	24 54	10 21 54	24 54	54
Dubelohstraße		26	25 55	11 22 55	25 55	55
Schloß Neuhaus Bahnhof		27	26 56	12 24 56	26 56	56
Fischerkamp		28	27 57	13 25 57	27 57	57
Hatzfelder Platz	15 29	11 29 37 59	09 15 27 33 35 59	12 29 42 59	16 59	16 46
Schloß Neuhaus	16 30	12 31 39 01	11 17 30 35 37 01	14 31 44 01	17 01	17 47
Marienloher Straße	17 31	13 32 40 02	12 18 31 36 38 02	15 32 45 02	18 02	18 48
Fürstenallee	18 32	14 33 41 03	13 19 32 37 39 03	16 33 46 03	19 03	19 49
An der Kapelle	19 33	15 34 42 04	14 20 33 38 40 04	17 34 47 04	20 04	20 50
Padersee		34	35 05	21 41 05	35 05	05
MuseumsForum		35	36 06	22 35 42 06	36 06	06
Ferrariweg		35	37 07	23 36 43 07	37 07	07
Freibad/Schützenplatz		36	38 08	24 37 44 08	38 08	08
Rolandsweg		37	39 09	25 38 45 09	39 09	09
Fürstenweg	23 38	19 40 47 10	19 26 40 43 46 10	22 40 52 10	24 10	24 54
Neuhäuser Tor	24 39	20 41 48 11	20 27 41 44 47 11	23 41 53 11	25 11	25 55
Westerntor	26 41	22 43 50 13	22 29 43 46 49 13	25 43 55 13	26 13	26 56
Hauptbahnhof	28 43	24 45 52 15	24 31 45 48 51 15	27 45 57 15	28 15	28 58

A nur an Schultagen; ab Hauptbahnhof weiter bis Goerdeler Straße
B nur an Schultagen
1 Linie 1 (Hauptbahnhof)