

Program

Multidisciplinary

Facets of
Data Science



18 - 20 March

A Joint Data Science Conference of
Gesellschaft für Klassifikation (GfK)
Data Science Society,

Section on Classification and Data Analysis (SKAD)
of the Polish Statistical Association,

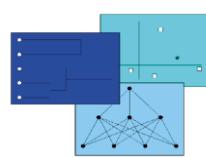
Classification and Data Analysis Group (CLADAG)
of the Italian Statistical Society,

Japanese Classification Society (JCS),

British Classification Society (BCS),

European Association for Data Science (EuADS)

organized by the **University of Bayreuth**



JCS



EuADS



UNIVERSITÄT
BAYREUTH

General Conference Chair and Program Chairs

Daniel Baier
Berthold Lausen
Angela Montanari

University of Bayreuth, Germany
University of Essex, United Kingdom
Università di Bologna, Italy

Program

Bernd Bischi	LMU Munich, Germany
Ricarda Bouncken	University of Bayreuth, Germany
Paula Brito	University of Porto, Portugal
Ines Brusch	BTU Cottbus-Senftenberg, Germany
Michael Brusch	Anhalt University of Applied Science, Germany
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Theodoros Chatzipantelis	Aristotle University of Thessaloniki, Greece
Andreas Christmann	University of Bayreuth, Germany
Cristina Davino	University of Naples Federico II, Italy
Reinhold Decker	University of Bielefeld, Germany
Jose Dias	Instituto Universitario di Lisboa, Portugal
Peter A. Flach	University of Bristol, United Kingdom
Sugnet Gardner-Lubbe	University of Cape Town, South Africa
Claas Christian Germelmann	University of Bayreuth, Germany
Andreas Geyer-Schulz	KIT Karlsruhe, Germany
Henner Gimbel	University of Augsburg, Germany
Dominik Heider	University of Marburg, Germany
Christian Hennig	University College London, United Kingdom
Eyke Hüllermeier	University of Paderborn, Germany
Tadashi Imaizumi	Tama University, Japan
Stefan Jablonski	University of Bayreuth, Germany
Krzysztof Jajuga	Wrocław University of Economics, Poland
Hans Kestler	University of Ulm, Germany
Friedrich Leisch	Universität für Bodenkultur Wien, Austria
Hermann Locarek-Junge	TU Dresden, Germany
Karsten Lübke	FOM University of Applied Sciences Dortmund, Germany
Fionn Murtagh	University of Huddersfield, United Kingdom
Atsuho Nakayama	Tokyo Metropolitan University, Japan
Akinori Okada	Tama University, Japan
Francesco Palumbo	University of Naples Federico II, Italy
Józef Pociecha	Cracow University of Economics, Poland
Alexandra Rese	University of Bayreuth, Germany
Roberto Rocci	Università di Roma Tor Vergata, Italy
Adam Sagan	Cracow University of Economics, Poland
Ute Schmid	University of Bamberg, Germany
Lars Schmidt-Thieme	University of Hildesheim, Germany
Frank Scholze	KIT Karlsruhe, Germany
Winfried Steiner	TU Clausthal-Zellerfeld, Germany
Alfred Ultsch	University of Marburg, Germany
Nils Urbach	University of Bayreuth, Germany
Katrijn van Deun	Tilburg University, The Netherlands
Maurizio Vichi	Sapienza Università di Roma, Italy
Claus Weihs	University of Dortmund, Germany
Adalbert Wilhelm	Jacobs University Bremen, Germany
Herbert Woratschek	University of Bayreuth, Germany

Committee

LMU Munich, Germany
University of Bayreuth, Germany
University of Porto, Portugal
BTU Cottbus-Senftenberg, Germany
Anhalt University of Applied Science, Germany
Università degli Studi di Padova, Italy
Aristotle University of Thessaloniki, Greece

University of Bayreuth, Germany

University of Naples Federico II, Italy

University of Bielefeld, Germany

Instituto Universitario di Lisboa, Portugal

University of Bristol, United Kingdom

University of Cape Town, South Africa

University of Bayreuth, Germany

KIT Karlsruhe, Germany

University of Augsburg, Germany

University of Marburg, Germany

University College London, United Kingdom

University of Paderborn, Germany

Tama University, Japan

University of Bayreuth, Germany

Wrocław University of Economics, Poland

University of Ulm, Germany

Universität für Bodenkultur Wien, Austria

TU Dresden, Germany

FOM University of Applied Sciences Dortmund, Germany

University of Huddersfield, United Kingdom

Tokyo Metropolitan University, Japan

Tama University, Japan

University of Naples Federico II, Italy

Cracow University of Economics, Poland

University of Bayreuth, Germany

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Cracow University of Economics, Poland

University of Bamberg, Germany

University of Hildesheim, Germany

KIT Karlsruhe, Germany

TU Clausthal-Zellerfeld, Germany

University of Marburg, Germany

University of Bayreuth, Germany

Tilburg University, The Netherlands

Sapienza Università di Roma, Italy

University of Dortmund, Germany

Jacobs University Bremen, Germany

University of Bayreuth, Germany



Foreword

Dear Colleagues,

Dear Participants of the Fifth European Conference on Data Analysis (ECDA2019), a warm welcome to the University of Bayreuth. After five previous conferences, held in Luxembourg (July 2013), Bremen (July 2014) Colchester (September 2015), Wroclaw (September 2017) and Paderborn (July 2018) we now meet in Bayreuth, Germany, a city well-known for Richard Wagner and his well-known Festival Theatre, but also for the Margravial Opera House – a UNESCO World Cultural Heritage –, charming castles and historical parks as well as its museums.



The conference – organized by the University of Bayreuth – is a joint effort of

- the German Classification (GfKI) Data Science Society,
- the Section on Classification and Data Analysis (SKAD) of the Polish Statistical Association,
- the Classification and Data Analysis Group (CLADAG) of the Italian Statistical Society,
- the Japanese Classification Society (JCS),
- the British Classification Society (BCS), and
- the European Association for Data Science (EuADS).

We especially want to thank the special session organizers, the program committee, the plenary and session speakers as well as the local organization team for their extensive engagement.

Thanks to them we have the chance to meet and discuss the theoretical and applied problems of data science. This conference is also a great opportunity to establish professional and personal relations between researchers from many countries.

We wish you fruitful discussions during the conference. We hope that you can find some time to enjoy Bayreuth, its museums and music!

Daniel Baier, University of Bayreuth, Germany (General Conference Chair),

Berthold Lausen, University of Essex, UK (Program Chair),

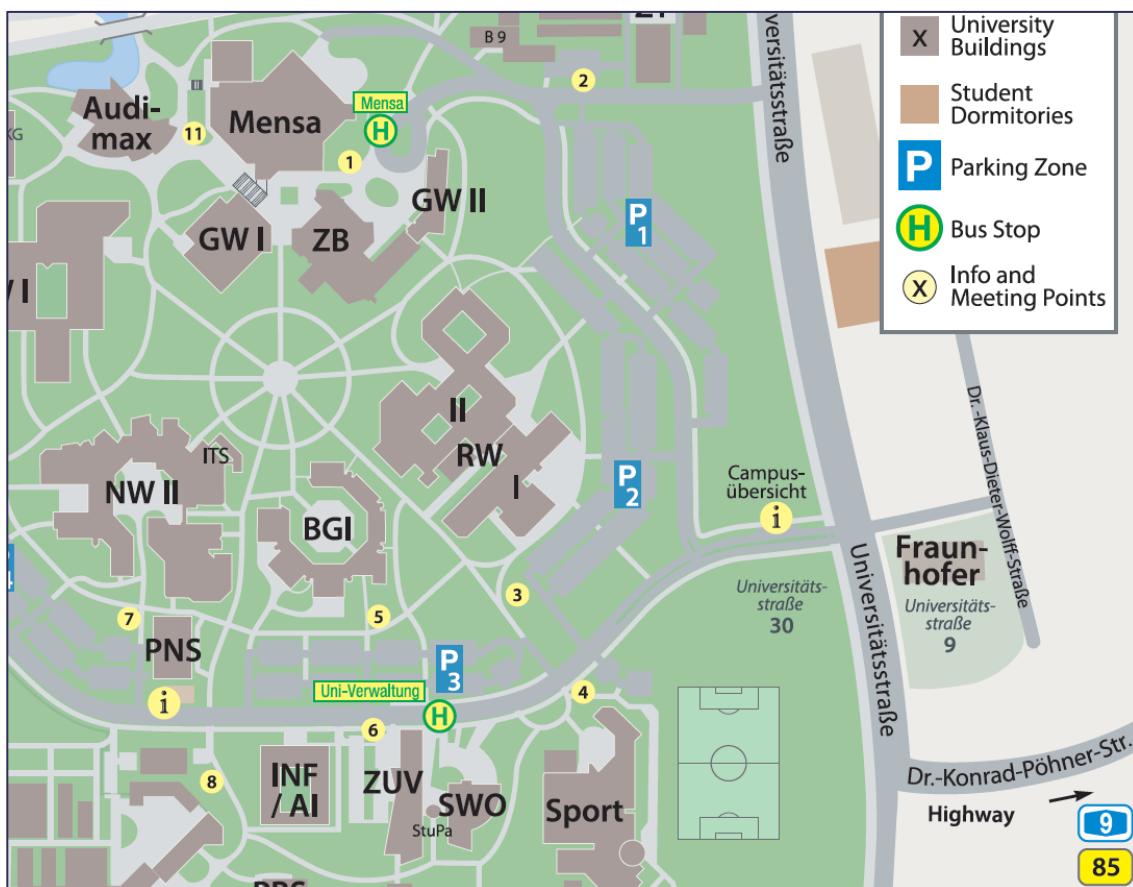
Angela Montanari, University of Bologna, Italy (Program Chair).

General information

The seminar focuses on recent developments in data analysis from handling of missing data, clustering, and visualization to applications in finance and marketing. Also, e.g., the problem of (mis-)interpretation of statistics by journalists, plays a role.

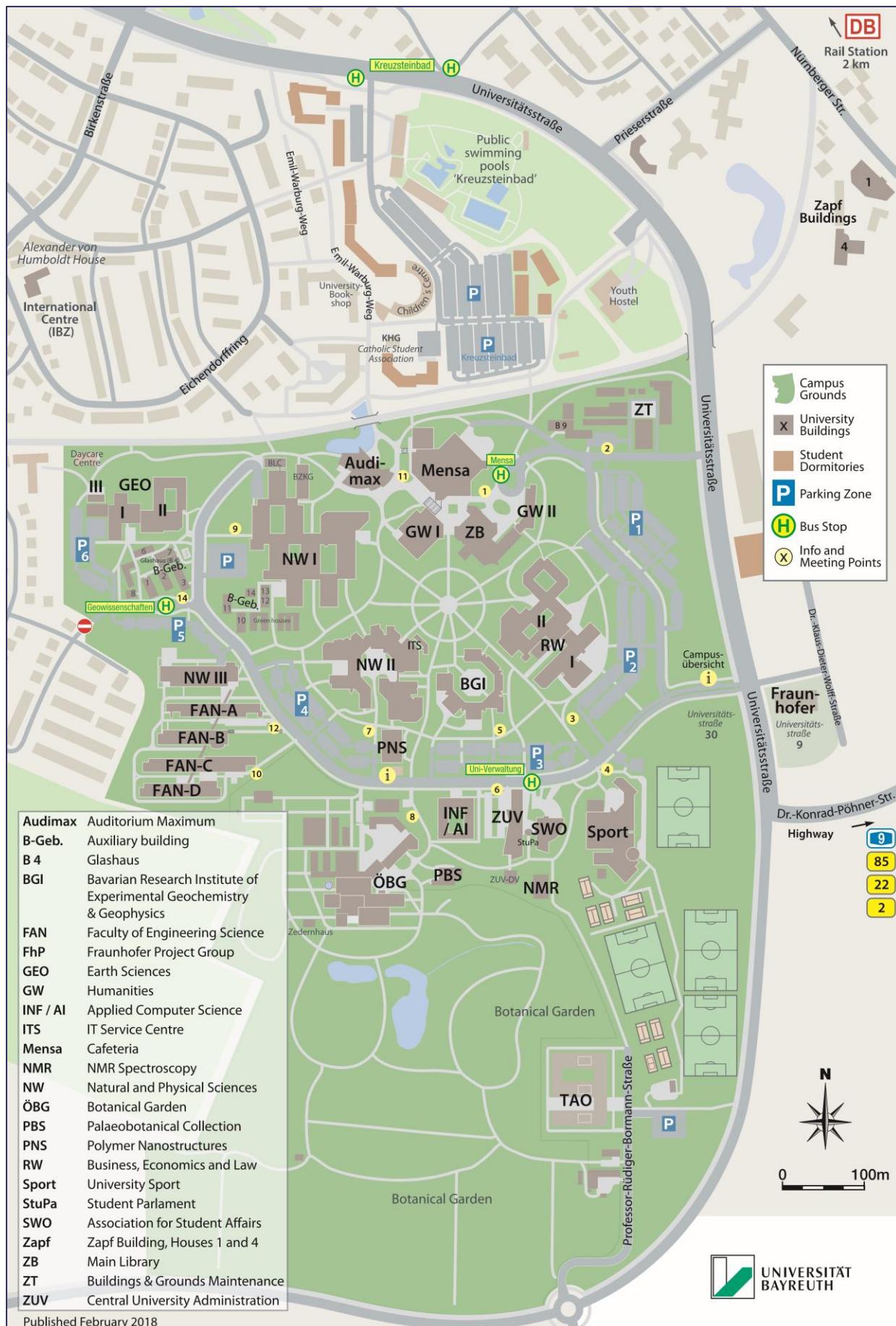
Lecturers have the possibility to publish a full article in a **special issue of “Archives of Data Science, Series A”**. The Deadline for the submission is May 15, 2019. Please note in the submission comments field the shortcut “GPSDAA2019”. When preparing your article, please follow hints and guidelines at www.gpsdaa2019.de. The paper should have a length of 10-14 pages. In the case of questions, please contact Andreas.Geyer-Schulz@kit.edu or Victoria-Anne.Schweigert@kit.edu.

The GPSDAA2019 **registration desk, coffee, cake, and lunch bar are located** in the **foyer of RW I, just in front of lecture hall H25** (Universitätsstraße 30, 95447 Bayreuth, see www.gpsdaa2019.de). A **shuttle bus** connects **seminar hotels** (Arvena, Bayerischer Hof, Rheingold) with **RW I** (bus stop “Zentrale Universitätsverwaltung”/“Uni-Verwaltung”), starting at 8:15 from Arvena to Bayerischer Hof, Rheingold, RW I, and at 17:00 from RW I to Rheingold, Bayerischer Hof, Arvena.

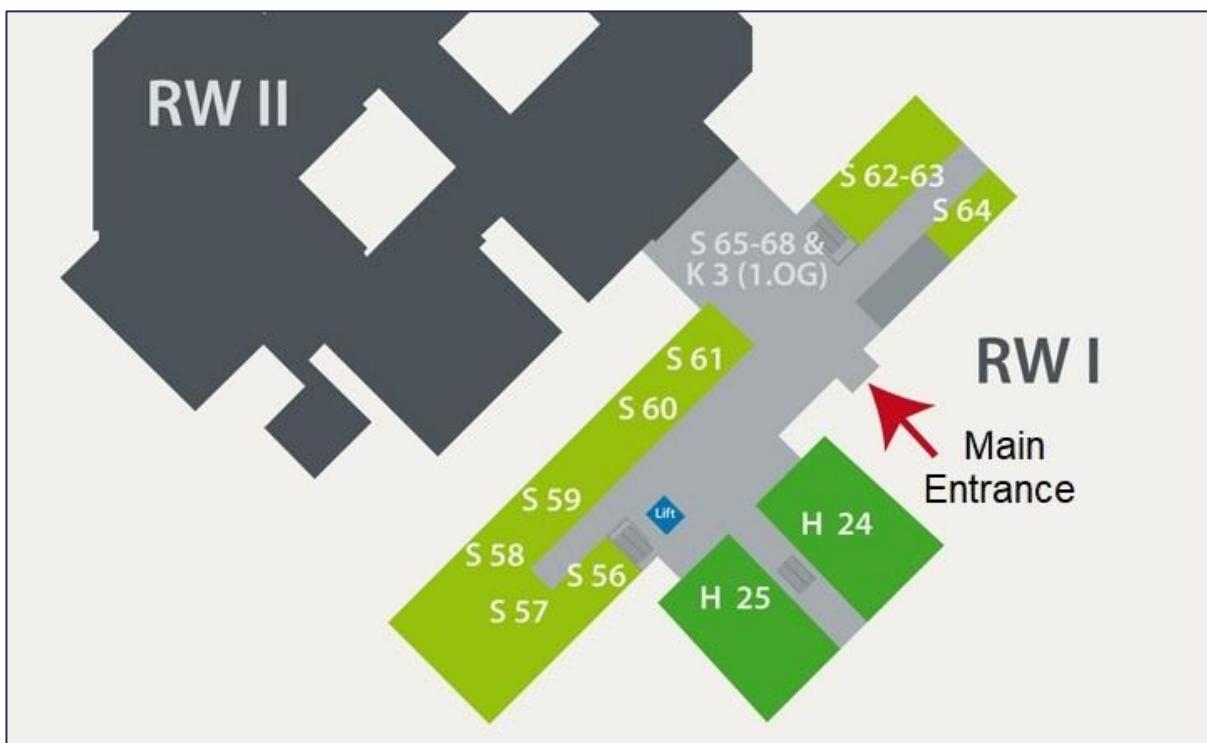
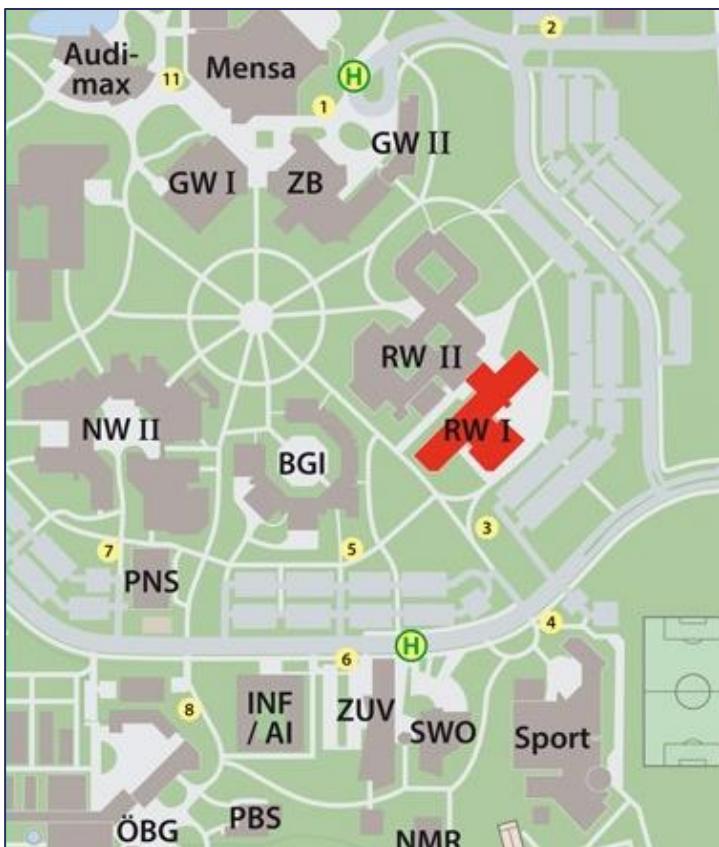


For connecting with the Wi-Fi network “@BayernWLAN” just turn on your Wi-Fi and connect with this free network. Afterwards, the landing page of BayernWLAN will open. If not just open any website with your browser. In the last step, you need to agree with the terms of use and click on “Verbinden” (German word for “Connect”). EduRoam is also available in all over RW I and the University of Bayreuth.

Campus Plan



Map of RW-Building



Telephone List

General information	
police	110
fire department	112
poison center	+49 (0) 89 19240
Poison Information Center Nuremberg	+49 (0) 911 3982451 +49 (0) 911 3982665
Hotels	
Arvena Kongress Hotel	+49 (0) 921 7270
Hotel Bayerischer Hof	+49 (0) 921 78600
Hotel Rheingold	+49 (0) 921 9900850
Bus / Taxi	
Bus(-shuttle) Losert	+49 (0) 921 46008025
Taxi Klein	+49 (0) 921 1508775
Taxi Schröder	+49 (0) 921 66622
Taxi & MW Alexander Kroter	+49 (0) 921 22011
Taxi company Protzel & Protzel	+49 (0) 921 47776

Shuttle Services

Omnibusreisen Marcus Losert GmbH & Co. KG; Tel.: (09 21) 46 00 80 25; info@losert-reisen.de

Monday, the 18th of March 2019

First drive (**three** busses) at 7:45 AM (from the hotels Arvena Hotel, Bayerischer Hof & Rheingold; Destination: University of Bayreuth (bus stop "Zentrale Universitätsverwaltung")

Second drive (**two** busses) at 5:30PM (from the university bus stop "Zentrale Universitätsverwaltung"); Destination: Richard Wagner museum

Third drive (**two** busses) at 6:45PM (from the university bus stop "Zentrale Universitätsverwaltung"); Destination: Richard Wagner museum

Tuesday, the 19th of March 2019

First drive (**three** busses) at 8:30 AM (from the hotels Arvena Hotel, Bayerischer Hof & Rheingold; Destination: University of Bayreuth (bus stop "Zentrale Universitätsverwaltung")

Second drive (**three** busses) at 4:30PM (from the bus stop "Zentrale Universitätsverwaltung") to the mentioned hotels Arvena, Bayerischer Hof & Rheingold **and** the restaurant "Liebesbier"

Third drive (**one** bus) at 6:00 PM from the bus stop "Zentrale Universitätsverwaltung") to the restaurant "Liebesbier"

Fourth drive (two busses) at 10:30PM from the restaurant "Liebesbier" to the hotels Arvena, Bayerischer Hof & Rheingold

Wednesday, the 20th of March 2019

First drive (**two** busses) at 8:30 AM (from the hotels Arvena Hotel, Bayerischer Hof & Rheingold; Destination: University of Bayreuth (bus stop "Zentrale Universitätsverwaltung")

Second drive (**two** busses) at 2:00 PM from the bus stop "Mensa" to the hotels Arvena Hotel, Bayerischer Hof & Rheingold

Public Transport – Hotels & University

Hotel Arvena Kongress

Outward Journey (Duration: 18 minutes)

Walkway ca. 3 minutes to bus stop *Berliner Platz*



- Departure: 7:32 from bus stop *Berliner Platz* (Bus 301 in direction to ZOH -Jakobshof)
- Arrival 7:37 Bayreuth ZOH
Change 7:40 at ZOH (in Bus 306 at platform L)
- Arrival: 7:47 at Mensa

Return (Duration: 22 minutes)

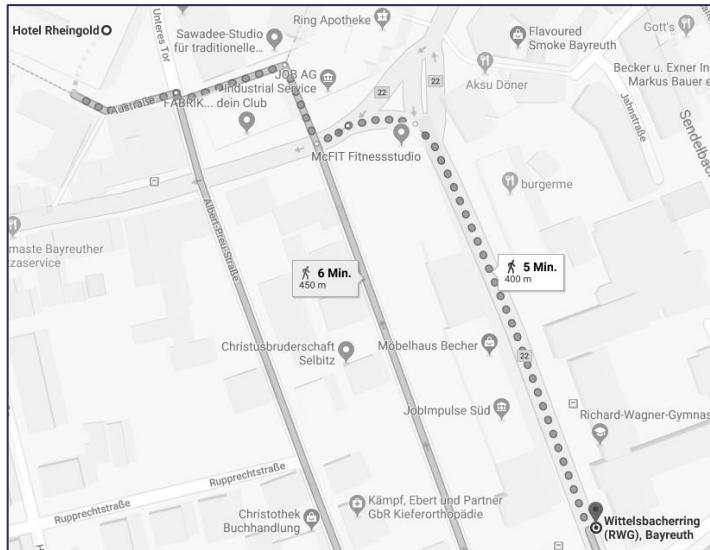
- Departure: 17:16 from bus stop Mensa (Bus 306 in direction to ZOH – Roter Hügel)
- Arrival: 17:25 Bayreuth ZOH
Change: 17:30 at ZOH (in Bus 301 from platform J)
- Arrival: 17:32 at *Berliner Platz*

Walkway ca. 4 minutes to the Hotel

Hotel Rheingold

Outward Journey (Duration: 10 minutes)

Walkway ca. 5 minutes to bus stop *Wittelsbacherring*



- Departure: 7:42 from bus stop *Wittelsbacherring* (Bus 306 in direction to Campus)
- Arrival: 7:47 at *Mensa*

Return (Duration: 21 minutes)

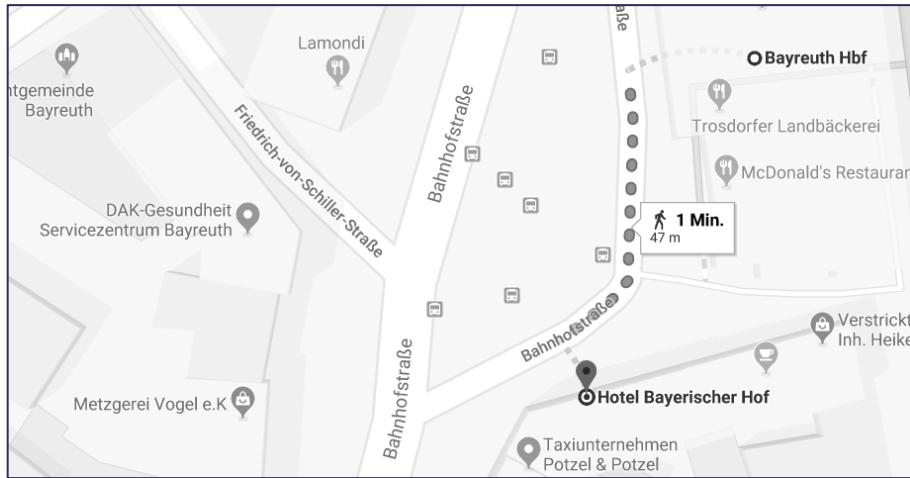
- Departure: 17:36 from bus stop *Mensa* (Bus 306 in direction to ZOH – Roter Hügel)
- Arrival: 17:47 Bayreuth ZOH
Change: 17:50 at ZOH (in Bus 315 from platform E)
- Arrival: 17:52 at *Wittelsbacherring*

Walkway ca. 5 minutes to the Hotel

Hotel Bayerischer Hof

Outward Journey (Duration: 17 minutes)

Walkway ca. 1 minute



- Departure: 7:31 from bus stop *Bayreuth Hbf* (Bus 328)
- Arrival 7:36 Bayreuth ZOH
Change: 7:40 at ZOH (in Bus 306 in direction to Campus; platform L)
- Arrival: 7:47 at bus stop *Mensa*

Return: (Duration ca. 17 minutes)

- Departure 17:15 bus stop *Mensa* (Bus 316)
- Arrival: 17:25 at bus stop *Bayreuth Hbf*

Walkway ca. 1 minute

Program

Date: Monday, 18/Mar/2019						
8:00am 8:45am	Registration Location: Foyer RW I					
8:45am 9:00am	Opening Location: H24 (RW I)					
9:00am 9:45am	Plenary: Analyzing Retail Market Basket Data by Unsupervised Machine Learning Methods by Harald Hruschka (University of Regensburg, Germany) Location: H24 (RW I)					
9:45am 10:30am	Plenary: Zero-Sum Regression by Rainer Spang (University of Regensburg, Germany) Location: H24 (RW I)					
10:30am 11:00am	Coffee break Location: Foyer RW I					
11:00am 12:15pm	Statistics and Data Analysis Location: S57 (RW I)	Clustering 1 Location: S58 (RW I)	Machine Learning 1 Location: S59 (RW I)	Biostatistics and Bioinformatics 1 Location: S61 (RW I)	Data Analysis in Finance 1 Location: S62 (RW I)	Consumer Preferences and Marketing Analytics 1 Location: S64 (RW I)
12:15pm 1:30pm	Lunch (Monday) Location: Frischraum (Mensa)					
1:00pm 1:30pm	Software Demonstration: Process Mining Using Celonis (Jerome Geyer-Klingenberg and Angela-Sophia Gebert, Celonis SE) Location: H24 (RW I)					
1:30pm 2:15pm	Plenary: Co-Clustering – A Survey on Models, Algorithms and Applications by Hans-Hermann Bock (RWTH Aachen, Germany) Location: H24 (RW I)			Plenary: Discrete Time-to-Event Analysis – Methods and Recent Developments by Matthias Schmid (University of Bonn, Germany) Location: H25 (RW I)		
2:15pm 3:00pm	Plenary: Composite Indicators and Rankings by Andrzej Sokolowski (University of Krakow, Poland) Location: H24 (RW I)			Plenary: Big Data Science in Systems Medicine – A Disruptive View on Current Medicine by Jan Baumbach (TU Munich, Germany) Location: H25 (RW I)		
3:00pm 3:30pm	Coffee break Location: Foyer RW I					
3:30pm 5:10pm	Statistical Learning Location: S57 (RW I)	Clustering 2 Location: S58 (RW I)	Interpretable Machine Learning 1 Location: S59 (RW I)	Biostatistics Location: S61 (RW I)	Data Analysis in Finance 2 Location: S62 (RW I)	Consumer Preferences and Marketing Analytics 2 Location: S64 (RW I)
5:10pm 5:30pm	Coffee break Location: Foyer RW I					
5:30pm 6:45pm	Data Science Education Location: S57 (RW I)	Machine Learning 2 Location: S59 (RW I)	Biostatistics and Bioinformatics 2 Location: S61 (RW I)	Data Analysis in Finance 3 Location: S62 (RW I)	Consumer Preferences and Marketing Analytics 3 Location: S64 (RW I)	
7:00pm 9:00pm	Welcome Reception (Richard Wagner museum by walking or bus shuttle) Location: Richard Wagner museum					

Date: Tuesday, 19/Mar/2019									
9:00am 9:45am	Plenary: Using Microblogging to Predict IPO Success by Means of Apache Spark Big Data Analytics by Dirk Van den Poel (University of Ghent, Belgium) Location: H24 (RW I)			Plenary: Meta-Analysis and Symbolic Data Analysis by Masahiro Mizuta (Hokkaido University, Japan) Location: H25 (RW I)					
9:45am 11:00am	Complexity, Data Science and Statistics through Visualization and Classification 1 Location: S57 (RW I)	Stream Mining 1 Location: S58 (RW I)	Interpretable Machine Learning 2 Location: S59 (RW I)	Data Analysis in Psychology Location: S61 (RW I)	Data Analysis in Finance 4 Location: S62 (RW I)	Marketing Research Location: S64 (RW I)			
11:00am 11:30am	Coffee break Location: Foyer RW I								
11:30am 1:10pm	Complexity, Data Science and Statistics through Visualization and Classification 2 Location: S57 (RW I)	Image and Text Mining Location: S58 (RW I)	Interpretable Machine Learning 3 Location: S59 (RW I)	Data Analysis in Medicine, Health Care and Ecology Location: S61 (RW I)	Data Analysis in Industrial Automation 1 Location: S62 (RW I)	Structural Equation Models in Marketing 1 Location: S64 (RW I)			
1:10pm 1:55pm	General Meeting AG DANK Location: S58 (RW I)								
1:10pm 2:25pm	Lunch (Tuesday) Location: Frischraum (Mensa)								
2:25pm 3:10pm	Plenary: CB-SEM or PLS-SEM? Five Perspectives and Five Recommendations by Marko Sarstedt (Otto von Guericke University Magdeburg, Germany) Location: H24 (RW I)			Plenary: Relations Among K-means, Mixture of Distributions, and Fuzzy Clustering by Sadaaki Miyamoto (University of Tsukuba, Japan) Location: H25 (RW I)					
3:10pm 4:25pm	Debate: Data Science - Occupation or Profession? Location: S57 (RW I)	Stream Mining 2 Location: S58 (RW I)	Machine Learning 3 Location: S59 (RW I)	Data Analysis in Industrial Automation 2 Location: S62 (RW I)	Structural Equation Models in Marketing 2 Location: S64 (RW I)				
4:25pm 4:45pm	City Tour Location: Foyer RW I			Coffee break Location: Foyer RW I					
4:30pm 6:00pm	General Meeting GfKI Location: S57 (RW I)								
7:00pm	Conference Dinner at Restaurant "Liebesbier" Location: Liebesbier Restaurant & Craft-Bier								

Date: Wednesday, 20/Mar/2019						
9:00am 9:45am	PLS-SEM 1: Partial Least Squares Structural Equation Modeling Workshop - Introduction Location: S57 (RW I)			Plenary: Archetypes, Prototypes and Other Types: The Current State and Prospects for Future Research by Francesco Palumbo (University of Naples Federico II, Italy) Location: H24 (RW I)		
9:45am 11:00am	PLS-SEM 2: Fundamentals of Measurement I Location: S57 (RW I)	Dimension Reduction 1 Location: S58 (RW I)	Machine Learning 4 Location: S59 (RW I)	Data Analysis in Social Sciences 1 Location: S61 (RW I)	Data Analysis Models in Economics and Business 1 Location: S62 (RW I)	Social Network Analysis Location: S64 (RW I)
11:00am 11:30am	Coffee break Location: Foyer RW I					
11:30am 12:45pm	PLS-SEM 3: Fundamentals of Measurement II Location: S57 (RW I)	Dimension Reduction 2 Location: S58 (RW I)	Machine Learning 5 Location: S59 (RW I)	Data Analysis in Social Sciences 2 Location: S61 (RW I)	Data Analysis Models in Economics and Business 2 Location: S62 (RW I)	Innovation Location: S64 (RW I)
12:45pm 1:00pm	Closing of the Conference Location: H24 (RW I)					
1:00pm 1:45pm	Lunch (Wednesday) Location: Frischraum (Mensa)					
1:45pm 3:00pm	PLS-SEM 4: Assessment of PLS-SEM: Results and Exercises I Location: S57 (RW I)					
3:00pm 3:15pm	Coffee break Location: Foyer RW I					
3:15pm 5:00pm	PLS-SEM 5: Assessment of PLS-SEM: Results and Exercises II; Outlook on Advanced Topics Location: S57 (RW I)					

Conference Agenda

MONDAY

8:00am - 8:45am <u>Foyer RW I</u>	Registration
8:45am - 9:00am <u>H24 (RW I)</u>	Opening Daniel Baier (University of Bayreuth, General Conference Chair ECDA2019), Torsten Eymann (University of Bayreuth, Vice President for Information Technology & Entrepreneurship), Berthold Lausen (President IFCS, President GfKI, Program Chair ECDA2019), Francesco Palumbo (University of Naples Federico II, General Conference Chair ECDA2020)
9:00am - 9:45am <u>H24 (RW I)</u>	Plenary: Analyzing Retail Market Basket Data by Unsupervised Machine Learning Methods by Harald Hruschka (University of Regensburg, Germany) Session Chair: Winfried Steiner
9:45am - 10:30am <u>H24 (RW I)</u>	Plenary: Zero-Sum Regression by Rainer Spang (University of Regensburg, Germany) Session Chair: Berthold Lausen
10:30am - 11:00am <u>Foyer RW I</u>	Coffee break
11:00am - 12:15pm <u>S57 (RW I)</u>	Statistics and Data Analysis Session Chair: Ulrich Müller-Funk <hr/> Interpretability of Prediction Intervals for Neural Net <u>Claus Weihs</u> , Malte Jastrow University of Dortmund, Germany
	Sense and Sensibility: Measuring the Predictive Significance of Classifiers <u>Ulrich Müller-Funk</u> ¹ , Stefanie Weiß ² ¹ Westfälische Wilhelms-Universität Münster, Germany; ² Deutsche Telekom
	On the Use of the Imprecise Dirichlet Model in the Case of Missing Data <u>Aziz Omar</u> ^{1,2} , Thomas Augustin ¹ ¹ Department of Statistics, LMU Munich, Germany; ² Helwan University, Egypt
11:00am - 12:15pm <u>S58 (RW I)</u>	Clustering 1 Session Chair: Christian Hennig <hr/> A Multivariate Characterisation of Clustering Quality and Validity <u>Christian Hennig</u> University of Bologna, Italy
	On a Class of Minimum Distance Aggregation Clustering Algorithms Based on Bi-Partial Objective Function <u>Jan W. Owsiski</u> Systems Research Institute, Polish Academy of Sciences, Poland
	Cluster Validation for Mixed-type Data <u>Rabea Aschenbruck</u> , Gero Szepannek Hochschule Stralsund, Germany
11:00am - 12:15pm <u>S59 (RW I)</u>	Machine Learning 1 Session Chair: Josef Schosser <hr/> Multivariate Extrapolation – a Tensor-Based Approach <u>Josef Schosser</u> , Angelika Schmid University of Passau, Germany

	Time Series Forecasting Using Variants of Recurrent Neural Networks CHETTAN KUMAR, SAFAK KURT, Stefan Schönig, Stefan Jablonski University of Bayreuth
11:00am - 12:15pm <u>S61 (RW I)</u>	Biostatistics and Bioinformatics 1 (organized by Dominik Heider) Session Chair: Rainer Spang
	An Effects Size Measure Based on Probabilities and Covering Data Sets where Cohen's d is not Applicable <u>Alfred Ultsch</u> ¹ , Jörn Lötsch ^{2,3} ¹ DataBionics Research Group, University of Marburg, Hans - Meerwein - Straße, 35032 Marburg, Germany; ² Institute of Clinical Pharmacology, Goethe - University, Theodor Stern Kai 7, 60590 Frankfurt am Main, Germany; ³ Fraunhofer Institute for Molecular Biology and Applied Ecology IME, Project Group Translational Medicine and Pharmacology TMP, Theodor – Stern - Kai 7, 60590 Frankfurt am Main, Germany
	Incorporating Foreign Classes in Feature Selection Processes <u>Robin Szekely</u> , Ludwig Lausser, Hans A. Kestler Institute of Medical Systems Biology, Ulm University, Germany
	A Comparative Study on Peptide Encodings for Biomedical Classification <u>Sebastian Spänig</u> , Dominik Heider Department of Bioinformatics, Faculty of Mathematics and Computer Science, University of Marburg, Germany
11:00am - 12:15pm <u>S62 (RW I)</u>	Data Analysis in Finance 1 Session Chair: Hermann Locarek-Junge
	Minimum MSE Hedging of Complex Financial Retail Structured Products in Discrete Time <u>Philip Rosenthal</u> , Rainer Baule University of Hagen, Germany
	The Volatility of Hourly Electricity Contracts on the Continuous Intraday Market <u>Michael Naumann</u> University of Hagen, Germany
	The Impact of Financial Speculation on Commodity Prices: A Meta-Granger Analysis Jerome Geyer-Klingenberg, Marie Hütter, Andreas Rathgeber, Florian Schmid, Thomas Wimmer Institute of Materials Resource Management, University of Augsburg, Werner-von-Siemens-Straße 6, 86159 Augsburg, Germany.
11:00am - 12:15pm <u>S64 (RW I)</u>	Consumer Preferences and Marketing Analytics 1 (organized by Reinhold Decker and Winfried Steiner) Session Chair: Winfried Steiner
	Ranking, Rating, and Pairwise Comparisons: On Transformations between Representations of Preference Structures <u>Andreas Geyer-Schulz</u> Karlsruhe Institute of Technology, Germany
	Multimodal Preference Heterogeneity in Choice-Based Conjoint Analysis: A Simulation Study <u>Nils Goeken</u> ¹ , Peter Kurz ² , Winfried Steiner ¹ ¹ Clausthal University of Technology; ² bms marketing research & strategy
	Optimizing Tickets for Sport Event Spectators <u>Mario Kaiser</u> , Herbert Woratschek University of Bayreuth, Germany

12:15pm - 1:30pm <u>Frischraum (Mensa)</u>	Lunch (Monday)
1:00pm - 1:30pm <u>H24 (RW I)</u>	Software Demonstration: Process Mining Using Celonis (Jerome Geyer-Klingenberg and Angela-Sophia Gebert, Celonis SE) Session Chair: Daniel Baier
1:30pm - 2:15pm <u>H24 (RW I)</u>	Plenary: Co-Clustering – A Survey on Models, Algorithms and Applications by Hans-Hermann Bock (RWTH Aachen, Germany) Session Chair: Claus Weihs
1:30pm - 2:15pm <u>H25 (RW I)</u>	Plenary: Discrete Time-to-Event Analysis – Methods and Recent Developments by Matthias Schmid (University of Bonn, Germany) Session Chair: Hans Kestler
2:15pm - 3:00pm <u>H24 (RW I)</u>	Plenary: Composite Indicators and Rankings by Andrzej Sokolowski (University of Krakow, Poland) Session Chair: Akinori Okada
2:15pm - 3:00pm <u>H25 (RW I)</u>	Plenary: Big Data Science in Systems Medicine – A Disruptive View on Current Medicine by Jan Baumbach (TU Munich, Germany) Session Chair: Dominik Heider
3:00pm - 3:30pm <u>Foyer RW I</u>	Coffee break
3:30pm - 5:10pm <u>S57 (RW I)</u>	Statistical Learning (organized by Angela Montanari) Session Chair: Angela Montanari
	The Importance of Being Clustered: Uncluttering the Trends of Statistics from 1970 to 2015 <u>Laura Anderlucci</u> , Angela Montanari, Cinzia Viroli University of Bologna, Italy
	Covariate Selection in Non-Gaussian Linear Regression Models: a Bayesian Solution <u>Giuliano Galimberti</u> , Saverio Ranciati, Gabriele Soffritti Università di Bologna, Italy
	An Algebraic Estimator for Large Spectral Matrices <u>Matteo Farnè</u> ¹ , <u>Matteo Barigozzi</u> ² ¹ University of Bologna, Italy; ² London School of Economics and Political Science, UK
	Fast and Robust Model Selection Based on Ranks <u>Wojciech Rejchel</u> ¹ , <u>Malgorzata Bogdan</u> ² ¹ Nicolaus Copernicus University in Torun; ² University of Wroclaw
3:30pm - 5:10pm <u>S58 (RW I)</u>	Clustering 2 Session Chair: Fionn Murtagh
	Bounds for the Number of Partitions of a Graph <u>Fabian Ball</u> , Andreas Geyer-Schulz Karlsruhe Institute of Technology, Germany
	A Bipartite-Graph Based Approach for Split-Merge Evolutionary Clustering <u>Veselka Boeva</u> ¹ , Milena Angelova ² , Elena Tsviporkova ³ ¹ Blekinge Institute of Technology, Sweden; ² Technical University of Sofia, Plovdiv, Bulgaria; ³ The Collective Center for the Belgian technological industry, Brussels, Belgium
	A Study on the Improvement of the Overlapping Cluster Analysis <u>Satoru Yokoyama</u> Aoyama Gakuin University, Japan

	Clustering Ranking Data via Copulas <u>Marta Nai Ruscone</u> LIUC, Italy
3:30pm - 5:10pm <u>S59 (RW I)</u>	Interpretable Machine Learning 1 (organized by Johannes Fürnkranz, Eneldo Loza Mencía and Ute Schmid) Session Chair: Johannes Fürnkranz <hr/> Interpretable Decision Sets - An Analysis <u>Jiri Filip, Tomas Kliegr</u> University of Economics, Prague, Czech Republic <hr/> Explaining Interpretable Models: A General Process Model for Explanation Generation in Inductive Logic Programming <u>Mark Gromowski, Michael Siebers, Ute Schmid</u> Cognitive Systems Group, University of Bamberg, Germany <hr/> Methods for Understanding the Influence of Input Variables on the Decision of a Deep Artificial Neural Network <u>Torsten Dietl</u> Technische Universität Darmstadt, Germany <hr/> Comparing Regularization Methods for Activation Maximization <u>Antonia Hain, Ulf Krumnack</u> University of Osnabrück, Germany
3:30pm - 5:10pm <u>S61 (RW I)</u>	Biostatistics Session Chair: Hans Kestler <hr/> Semantic Multi-class Classifier Systems in Precision Medicine <u>Lea Siegle, Ludwig Lausser, Hans A. Kestler</u> Institute of Medical Systems Biology, Ulm University, Germany <hr/> Attributable Fraction in Multifactorial Situations – Concepts and Properties of Commonly Used Methods <u>Carolin Malsch^{1,2}</u> ¹ Institute of Clinical Epidemiology and Biometry, University of Würzburg, Germany; ² Comprehensive Heart Failure Center, University Hospital of Würzburg, Germany <hr/> Improving Classification of Single-Cell Data Using Consensus Clustering Based on Different Laplacian eigenmaps <u>Cornelia Fütterer¹, Thomas Augustin¹, Christiane Fuchs²</u> ¹ LMU München, Germany; ² Helmholtz Zentrum München and Universität Bielefeld
3:30pm - 5:10pm <u>S62 (RW I)</u>	Data Analysis in Finance 2 (organized by Krzysztof Jajuga) Session Chair: Krzysztof Jajuga <hr/> Systemic risk and measures of connectedness in financial system for chosen countries <u>Katarzyna Kuziak, Krzysztof Piontek</u> Wrocław University of Economics, Poland <hr/> Low Volatility Anomaly and Value at Risk: Risk-adjusted Returns of Stock Portfolios Based on VaR Predictions <u>Bernhard Lange, Matthias Gehrke</u> FOM University of Applied Sciences, Germany <hr/> What Makes the Crowd Wise? An Empirical Analysis of Fundamental Information, Investor Sentiment, and Stock Market Performance <u>Brigitte Eierle, Sebastian Klamer, Matthias Muck</u> University of Bamberg, Germany

	<p>The Degree of Corporation Diversification: Insights from Ownership Concentration and Ownership Identity Joachim Rojahn, Florian Zechser isf Institute for Strategic Finance, FOM Hochschule, Essen, Germany</p>
3:30pm - 5:10pm <u>S64 (RW I)</u>	<p>Consumer Preferences and Marketing Analytics 2 (organized by Reinhold Decker and Winfried Steiner) Session Chair: Harald Hruschka</p>
	<p>Adaptive CBC: Are the Benefits Justifying its Additional Efforts Compared to Traditional CBC? <u>Benedikt Martin Brand</u>, Daniel Baier University of Bayreuth, Germany</p>
	<p>Value Creation in Fashion Retailing: Empirical Findings of a Jobs-To-Be-Done Framework Application <u>Franziska Kullak</u>, Daniel Baier, Herbert Woratschek University of Bayreuth, Germany</p>
	<p>Recommender Systems for Personalized Advertising: Success Factors for Designing Product Recommendations from a Customers' Perspective <u>Timo Schreiner</u>, Alexandra Rese, Daniel Baier University of Bayreuth, Germany</p>
	<p>Measuring Preferences for Complex Products – Self-explicated Methods vs. Pairwise Comparison-based Preference Measurement (PCPM) <u>Jörgen Eimecke</u>¹, Madeline Hecht², Julia Clara Buchold², Daniel Baier² ¹BF/M-Bayreuth e.V., Germany; ²University of Bayreuth, Germany</p>
5:10pm - 5:30pm <u>Foyer RW I</u>	<p>Coffee break</p>
5:30pm - 6:45pm <u>S57 (RW I)</u>	<p>Data Science Education Session Chair: Karsten Lübke</p>
	<p>Causal Modelling for Data Literacy - in Intro Stats? <u>Karsten Lübke</u>¹, Matthias Gehrke¹, Jörg Horst², Sebastian Sauer¹ ¹FOM University of Applied Sciences, Germany; ²Bielefeld University of Applied Sciences, Germany</p>
	<p>Industrial Data Science: implementation of a qualification concept for machine learning in industrial production <u>Jennifer Neuhaus-Stern</u>, Nadja Bauer, Daniel Horn, Malte Jastrow, Claus Weihs TU Dortmund University, Germany</p>
	<p>'Optimal' Data Reduction in Non-Stationary Systems <u>Jakob Krause</u> MLU Halle-Wittenberg, Germany</p>
5:30pm - 6:45pm <u>S59 (RW I)</u>	<p>Machine Learning 2 Session Chair: Atsuho Nakayama</p>
	<p>Amharic Handwritten Character Recognition Using Convolutional Neural Network Mesay Samuel Gondere¹, Lars Schmidt-Thieme², Abiot Sinamo Boltena³, <u>Hadi Samer Jomaa</u>² ¹Faculty of Computing and Software Engineering, Arba Minch University, Ethiopia; ²Information Systems and Machine Learning Lab, University of Hildesheim, Germany; ³School of Computing, Ethiopian Institute of Technology-Mekelle, Mekelle University</p>

	A Research Survey on Applications of Recurrent Neural Networks and its Variants <u>CHETTAN KUMAR</u> , Muhammad Hassaan, Stefan Jablonski University of Bayreuth
5:30pm - 6:45pm <u>S61 (RW I)</u>	<u>Biostatistics and Bioinformatics 2 (organized by Dominik Heider)</u> Session Chair: <u>Dominik Heider</u>
	A Novel Privacy-preserving Software Framework for Federated Machine Learning in Clinical Settings <u>Marta Lemanczyk</u> , Dominik Heider Department of Mathematics and Computer Science, Philipps-University of Marburg, Germany
	Inverse Document Frequency as the Distance for Clustering Gene Sets <u>Michael Christoph Thrun</u> ¹ , Catharina Lippmann ² , Ultsch Alfred ¹ ¹ Databionics Research Group, University of Marburg, Germany; ² Fraunhofer Institute of Molecular Biology and Applied Ecology - Project Group Translational Medicine and Pharmacology (IME-TMP), Theodor-Stern-Kai 7, 60590 Frankfurt am Main
	Extracting Ordinal Substructures from Multi-categorial Datasets <u>Lisa M. Schäfer</u> , Ludwig Lausser, Hans A. Kestler Institute of Medical Systems Biology, Ulm University, Germany
5:30pm - 6:45pm <u>S62 (RW I)</u>	<u>Data Analysis in Finance 3</u> Session Chair: <u>Hermann Locarek-Junge</u>
	Negations and Newspaper Sentiment – Improving and Testing the BPW-Dictionary <u>Matthias Pöferlein</u> University of Bayreuth, Germany
	Bubble Detection in Error Correction Models <u>Leopold Sögner</u> ¹ , Martin Wagner ² ¹ Institute for Advanced Studies, Austria; ² TU Dortmund
5:30pm - 6:45pm <u>S64 (RW I)</u>	<u>Consumer Preferences and Marketing Analytics 3 (organized by Reinhold Decker and Winfried Steiner)</u> Session Chair: <u>Reinhold Decker</u>
	Investigating Machine Learning Techniques for Solving NP-hard Product-line Optimization Problems <u>Sascha Vöckler</u> ¹ , Daniel Baier ² ¹ Brandenburg University of Technology Cottbus-Senftenberg, Germany; ² University of Bayreuth, Germany
	New Notion of Constructing Brand Switching Matrix with Diagonal Elements <u>Akinori Okada</u> ¹ , Hiroyuki Tsurumi ² ¹ Rikkyo University; ² Yokohama National University
	Bored out or Stressed out – Respondents' Aggregation and Simplification Patterns in Preference Measurement <u>Alexander Sänn</u> ¹ , Jörgen Eimecke ² ¹ University of Bayreuth, Germany; ² BF/M Bayreuth
7:00pm - 9:00pm <u>Richard Wagner museum</u>	Welcome Reception (Richard Wagner museum by walking or bus shuttle) From 6:00pm possibility to visit the Wagner museum (guided tours every 10 min.)

TUESDAY

<p>9:00am - 9:45am <u>H24 (RW I)</u></p>	<p>Plenary: Using Microblogging to Predict IPO Success by Means of Apache Spark Big Data Analytics by Dirk Van den Poel (University of Ghent, Belgium) Session Chair: Reinhold Decker</p>
<p>9:00am - 9:45am <u>H25 (RW I)</u></p>	<p>Plenary: Meta-Analysis and Symbolic Data Analysis by Masahiro Mizuta (Hokkaido University, Japan) Session Chair: Claus Weihs</p>
<p>9:45am - 11:00am <u>S57 (RW I)</u></p>	<p>Complexity, Data Science and Statistics through Visualization and Classification 1 (organized by Carmela Iorio and Roberta Siciliano) Session Chair: Carmela Iorio Session Chair: Roberta Siciliano</p>
	<p>Enhancement on Probabilistic Boosted-Oriented Clustering Roberta Siciliano, Giuseppe Pandolfo, Antonio D'Ambrosio University of Naples Federico II, Italy</p> <hr/> <p>Interactive Visualization of Story-Boards: a Case Study of Long Time Series about Agriculture in Scotland Michele Staiano¹, Giuseppe Pandolfo¹, Richard Aspinall² ¹Department of Industrial Engineering, University of Naples Federico II, Italy; ²Independent, c/o James Hutton Institute, Craigiebuckler, Aberdeen, Scotland, UK</p> <hr/> <p>Nonparametric clustering of spherical data Giuseppe Pandolfo, Antonio D'Ambrosio University of Naples Federico II, Italy</p>
<p>9:45am - 11:00am <u>S58 (RW I)</u></p>	<p>Stream Mining 1 Session Chair: Andreas Geyer-Schulz</p> <hr/> <p>End-to-End Motion Classification Using Smartwatch Sensor Data Torben Windler, Junaid Ahmed Ghauri, Muhammad Usman Syed, Tamara Belostotskaya, Valerie Chikukwa, Rafael Rêgo Drumond Informations Systems and Machine Learning Lab, University of Hildesheim, Germany</p> <hr/> <p>Statistical Analysis of Unauthorized Internet Access Log Data and its Interpretation Hiroyuki Minami Hokkaido University, Japan</p> <hr/> <p>Comparison of Decision Tree Algorithms for Data Streams with Concept Drift Jennifer Neuhaus-Stern, Sarah Schnackenberg, Uwe Ligges TU Dortmund, Germany</p>
<p>9:45am - 11:00am <u>S59 (RW I)</u></p>	<p>Interpretable Machine Learning 2 (organized by Johannes Fürnkranz, Eneldo Loza Mencía and Ute Schmid) Session Chair: Eneldo Loza Mencia</p> <hr/> <p>Comprehensibility in Symbolic Decision Systems Florian Lerch, Alfred Ultsch Philipps University of Marburg, Germany</p> <hr/> <p>An Analysis of Design Choices in the LIME Framework Amir Hossein Akhavan Rahnama, Henrik Boström KTH (Royal Institute of Technology)</p>

	<p>Explaining Relational Concepts: When Visualisation and Visual Interpretation of a Deep Neural Network's Decision are not enough <u>Bettina Finzel</u>, Johannes Rabold, Ute Schmid University of Bamberg, Germany</p>
9:45am - 11:00am <u>S61 (RW I)</u>	<p>Data Analysis in Psychology Session Chair: <u>Claas Christian Germelmann</u></p> <hr/> <p>Representing and Analyzing the Tripartite Emotion Expression and Perception Model with Conditional Linear Gaussian Bayesian Networks <u>Eva Endres</u>¹, Thomas Augustin¹, Klaus Scherer² ¹LMU München, Germany; ²University of Geneva</p> <hr/> <p>What Drives AfD Election Success? <u>Sebastian Sauer</u>, Oliver Gansser FOM Hochschule, Germany</p> <hr/> <p>A single peaked multivariate logistic distance model <u>Mark de Rooij</u> Leiden University, The Netherlands</p>
9:45am - 11:00am <u>S62 (RW I)</u>	<p>Data Analysis in Finance 4 Session Chair: <u>Krzysztof Jajuga</u></p> <hr/> <p>Extended Construction of the Credibility Premium <u>Anne Sumpf</u> Technische Universität Dresden, Germany</p> <hr/> <p>Pricing options via Fourier transform - analysis of computational speed and accuracy <u>Arkadiusz Orzechowski</u> Warsaw School of Economics, Poland</p> <hr/> <p>Algorithmic Trading using Long Short-Term Memory Network and Portfolio Optimization Riccardo Lucato, Edgar Jimenez, Eduardo Salvador Rocha, Yang Qi, <u>Marina Gavriluk</u>, Rafael Rêgo Drumond University of Hildesheim, Germany</p>
9:45am - 11:00am <u>S64 (RW I)</u>	<p>Marketing Research Session Chair: <u>Herbert Woratschek</u></p> <hr/> <p>Influence of Error Factors in Marketing Research: A Monte Carlo Method Based Analysis in the Retail Context <u>Michael Brusch</u>¹, Ines Brusch², Eva Stüber³ ¹Anhalt University of Applied Sciences, Köthen, Germany; ²Brandenburg University of Technology Cottbus-Senftenberg, Cottbus, Germany; ³IFH Köln GmbH, Cologne, Germany</p> <hr/> <p>Handling Mechanisms of Missing Values within Marketing Research Journals -- A Literature-Based Analysis of Widely Used Missing Value Treatments Within High Ranked Marketing Journals and Open-Access Marketing Journals Redhwan Amer, Malek Simon Grimm, Ralf Wagner University Kassel, Germany</p> <hr/> <p>“Handled Missing Values in High-Ranked Journals: Empirical Study on Reasons and Impact” -- based on literature review analysis <u>Redhwan Amer</u>, Malek Simon Grimm, Ralf Wagner University Kassel, Germany</p>

11:00am - 11:30am <u>Foyer RW I</u>	Coffee break
11:30am - 1:10pm <u>S57 (RW I)</u>	<p>Complexity, Data Science and Statistics through Visualization and Classification 2 (organized by Carmela Iorio and Roberta Siciliano) Session Chair: Carmela Iorio Session Chair: Roberta Siciliano</p> <hr/> <p>Spatially weighted exploratory regression tree: a quantitative story-telling proposal <u>Carmela Iorio, Giuseppe Pandolfo, Roberta Siciliano</u> University of Naples Federico II, Italy</p> <hr/> <p>Median Constrained Bucket Order: a way to think about tied rankings <u>Antonio D'Ambrosio</u> University of Naples Federico II, Italy</p> <hr/> <p>Clustering of All that is Exceptional and Anomalous, Counterposed to Commonality, in Big Data Analytics <u>Fionn Murtagh</u> University of Huddersfield, United Kingdom</p> <hr/> <p>Detecting Unobserved Heterogeneity in Latent Growth Curve Models <u>Laura Trinchera¹, Katerina M. Marcoulides²</u> ¹NEOMA Business School, France; ²University of Florida</p>
11:30am - 1:10pm <u>S58 (RW I)</u>	<p>Image and Text Mining Session Chair: Ines Brusch</p> <hr/> <p>Verifying User Preferences - A Content Based Analysis of Images in an Online Travel Community <u>Ines Brusch</u> Brandenburg University of Technology Cottbus-Senftenberg, Germany</p> <hr/> <p>Beer Brand Image Classification Using Deep Learning <u>Atsuho Nakayama¹, Daniel Baier²</u> ¹Tokyo Metropolitan University, Japan; ²University of Bayreuth, Germany</p> <hr/> <p>The Effect of Preprocessing on Short Document Clustering <u>Cynthia Koopman, Adalbert Wilhelm</u> Jacobs University Bremen, Germany</p> <hr/> <p>2016 US Presidential Election Sentiment Analysis <u>Bryant Hwang</u> Korea International School, Korea, Republic of (South Korea)</p>
11:30am - 1:10pm <u>S59 (RW I)</u>	<p>Interpretable Machine Learning 3 (organized by Johannes Fürnkranz, Eneldo Loza Mencía and Ute Schmid) Session Chair: Ute Schmid</p> <hr/> <p>An interactive visual tool to enhance understanding of random forest predictions <u>Ram Bahadur Gurung¹, Tony Lindgren¹, Henrik Boström²</u> ¹Stockholm University, Sweden; ²Royal Institute of Technology (KTH), Sweden</p> <hr/> <p>Representational Capabilities of Distilled Soft Decision Trees <u>Benedikt Wagner¹, Tarek R. Besold²</u> ¹City, University of London, UK; ²Telefonica Innovation Alpha, Spain</p> <hr/> <p>Instance-based explanations: motivation, overview, and the evidence counterfactual approach <u>Yanou Ramon, David Martens</u> University of Antwerp, Belgium</p>

	<p>Oracle coaching for informative decision trees <u>Cecilia Sönströd</u>¹, Ulf Johansson², Henrik Boström³ ¹University of Borås, Sweden; ²Jönköping University, Sweden; ³KTH Royal Institute of Technology, Sweden</p>
11:30am - 1:10pm <u>S61 (RW I)</u>	<p>Data Analysis in Medicine, Health Care and Ecology Session Chair: Masahiro Mizuta</p>
	<p>Analyses of serum fatty acids and vitamin D with dimension reduction methods</p> <p><u>Yifan Chen</u>¹, Rojeet Shrestha², Zhen Chen², Hitoshi Chiba³, Shu-Ping Hui², Emiko Okada⁴, Shigekazu Ukawa⁵, Takafumi Nakagawa⁶, Koshi Nakamura⁷, Akiko Tamakoshi⁷, Yuriko Komiya¹, Hiroyuki Minami¹, Masahiro Mizuta¹ ¹Advanced Data Science Laboratory, Hokkaido University, Sapporo, Japan; ²Faculty of Health Sciences, Hokkaido University, Sapporo, Japan; ³Department of Nutrition, Sapporo University of Health Sciences, Sapporo, Japan; ⁴Department of Nutritional Epidemiology, National Institute of Health and Nutrition, Tokyo, Japan; ⁵Department of Nutritional Epidemiology, National Institute of Health and Nutrition, Tokyo, Japan; ⁶The Hokkaido Centre for Family Medicine, Sapporo, Japan; ⁷Department of Public Health, Hokkaido University Faculty of Medicine, Sapporo, Japan</p>
	<p>Graph theoretical network analysis for Diagnoses based on Comorbidities <u>Reinhard Schuster</u>¹, Timo Emcke² ¹MDK Nord (Medical Advisory Board of Statutory Health Insurance in Hamburg and Schleswig-Holstein), Germany; ²KVSH (Association of SHI Physicians)</p>
	<p>Comparison of Methods for Predicting High-cost Patients Captured Within the Oncology Care Model (OCM): A Simulation Study <u>Madhu Mazumdar</u>, Jung-Yi Lin, Kavita Dharamrajan, Wei Zhang, Mark Liu, Mark Sanderson, Luis Isola, Liangyuan Hu Icahn School of Medicine at Mount Sinai, United States of America</p>
	<p>Illuminating Interactions in Microbial Lake Ecology Using General Learning Chain Ensembles <u>Theodor Sperlea</u>¹, Daniela Beißer², Jens Boenigk², Dominik Heider¹ ¹Department of Bioinformatics, Faculty of Mathematics and Computer Science, Philipps-Universität Marburg, Germany; ²Biodiversity Department, Center for Water and Environmental Research, University of Duisburg-Essen, Germany</p>
11:30am - 1:10pm <u>S62 (RW I)</u>	<p>Data Analysis in Industrial Automation 1 Session Chair: Claus Weihs</p>
	<p>Data Analytics for Process Improvement in Industrial Settings <u>Stefan Thalmann</u>¹, <u>Matej Vukovic</u>², Jürgen Mangler³, Christian Huemer^{3,4}, Gerti Kappl^{3,4}, Stefanie Lindstaedt⁵ ¹University of Graz, Austria; ²Pro2Future GmbH, Austria; ³ACDP GmbH, Austria; ⁴TU Wien, Austria; ⁵Graz University of Technology</p>
	<p>Applying Two Theorems of Machine Learning to the Forecasting of Biweekly Arrivals at a Call Center <u>Michael Christoph Thrun</u>¹, Julian Märte², Peter Böhme¹, Tino Gehlert¹ ¹Viessmann Werke GmbH & Co. KG, 35107 Allendorf, Germany; ²Mathematics and Computer Science, University of Marburg, Germany</p>
	<p>Deep Neural Networks for Data-driven Modelling of a Tube Mill Using Automatic Feature Extraction <u>Christian Thiel</u>¹, Carolin Steidl², Sarah Johannesmann², Bernd Henning² ¹BENTELER Steel/Tube GmbH, Paderborn; ²Elektrische Messtechnik, EIM-E, Universität Paderborn</p>

11:30am - 1:10pm <u>S64 (RW I)</u>	Structural Equation Models in Marketing 1 Session Chair: Marko Sarstedt
	Technology Acceptance Model or Uses and Gratifications Approach: Which Approach Is Better Suited to Explain the Acceptance of Digital Voice Assistants? <u>Karolina Ewers</u> , Daniel Baier University Bayreuth, Germany
	Investigation of student satisfaction and student loyalty – a hierarchical latent variable model <u>Sarah Maria Wruck</u> , Winfried J. Steiner Clausthal University of Technology, Germany
	Discovering Kano's Model in service satisfaction analysis using cubic terms <u>Björn Stöcker</u> ¹ , Aydin Nasser ² ¹ BAUR Versand (GmbH & Co KG), Germany; ² COGITARIS Gesellschaft für Marktforschung (GmbH), Germany
	How to motivate a reviewer? Adoption of CRM Strategies to implement a successful relationship between a journal and a reviewer <u>Victoria-Anne Schweigert</u> , Andreas Geyer-Schulz Karlsruhe Institute of Technology, Germany
1:10pm - 1:55pm <u>S58 (RW I)</u>	General Meeting AG DANK
1:10pm - 2:25pm <u>Frischraum (Mensa)</u>	Lunch (Tuesday)
2:25pm - 3:10pm <u>H24 (RW I)</u>	Plenary: CB-SEM or PLS-SEM? Five Perspectives and Five Recommendations by Marko Sarstedt (Otto von Guericke University Magdeburg, Germany) Session Chair: Daniel Baier
2:25pm - 3:10pm <u>H25 (RW I)</u>	Plenary: Relations Among K-means, Mixture of Distributions, and Fuzzy Clustering by Sadaaki Miyamoto (University of Tsukuba, Japan) Session Chair: Hans-Hermann Bock
3:10pm - 4:25pm <u>S57 (RW I)</u>	Debate: Data Science - Occupation or Profession? Session Chair: Ursula Maria Garczarek Session Chair: Detlef Steuer
3:10pm - 4:25pm <u>S58 (RW I)</u>	Stream Mining 2 Session Chair: Ingo Schmitt
	Topic Modelling for Summarizing Industrial Log Data <u>Benjamin Klöpper</u> ¹ , Shunmuga Prabhu Siddharthan ¹ , Barbara Sprick ² , Marcel Dix ¹ ¹ ABB Corporate Research, Germany; ² SRH Hochschule Heidelberg
	Modeling PLM data to optimize car-dealership offerings <u>Dieter William Joenssen</u> HS Aalen, Germany
	Cognitive Bayesian Classification Based on Quantum Theory <u>Ingo Schmitt</u> BTU Cottbus-Senftenberg, Germany
3:10pm - 4:25pm <u>S59 (RW I)</u>	Machine Learning 3 Session Chair: Johannes Fürnkranz
	Towards Automated Machine Learning for Multi-Label Classification <u>Marcel Wever</u> , Felix Mohr, Eyke Hüllermeier, Alexander Hetzer

	Paderborn University, Germany
	<p>Algorithm Selection as Recommendation: From Collaborative Filtering to Dyad Ranking <u>Alexander Hetzer</u>, Marcel Wever, Felix Mohr, Eyke Hüllermeier Paderborn University, Germany</p> <hr/> <p>Well-Calibrated and Specific Probability Estimation Trees Ulf Johansson¹, Henrik Boström², Tuwe Löfström¹, Cecilia Sönströd³ ¹Jönköping University, Sweden; ²KTH, Royal Institute of Technology, Sweden; ³University of Borås, Sweden</p>
3:10pm - 4:25pm <u>S62 (RW I)</u>	<p>Data Analysis in Industrial Automation 2 Session Chair: <u>Adalbert Wilhelm</u></p> <hr/> <p>Predictive quality control in industrial production processes <u>Adalbert Wilhelm</u> Jacobs University Bremen, Germany</p> <hr/> <p>Using Errors-in-Variables Regression to model and analyze sequential Process Chains <u>Oliver Meyer</u>, Claus Weihs TU Dortmund University, Germany</p> <hr/> <p>Kriging and FANOVA graphs for Computer Experiments with Both Continuous and Categorical Inputs <u>Dominik Kirchhoff</u> Dortmund University of Applied Sciences and Arts, Germany</p>
3:10pm - 4:25pm <u>S64 (RW I)</u>	<p>Structural Equation Models in Marketing 2 Session Chair: <u>Adam Sagan</u></p> <hr/> <p>SEM-Tree hybrid models in the preferences analysis of the members of Polish households <u>Adam Sagan</u>, Mariusz Lapczynski Cracow University of Economics, Poland</p> <hr/> <p>Versioning, Price Fairness and Purchase Decision – an Empirical Investigation Bastian Werner, Ines Brusch, Larissa Bürks-Arndt Brandenburg University of Technology Cottbus-Senftenberg, Germany</p> <hr/> <p>Change Management and Acceptance of CRM Systems: An Analysis by Means of Partial Least Squares Christian Wehowski, Heike Papenhoff, <u>Karsten Lübke</u> FOM University of Applied Sciences, Germany</p>
4:25pm - 4:45pm <u>Foyer RW I</u>	City Tour
4:25pm - 4:45pm <u>Foyer RW I</u>	Coffee break
4:30pm - 6:00pm <u>S57 (RW I)</u>	General Meeting GfKI
7:00pm <u>Liebesbier Restaurant & Craft-Bier</u>	<p>Conference Dinner at Restaurant "Liebesbier" Before dinner, there is the opportunity to do a City Tour (with the first groups starting at the university at 4:25 pm) and a Brewery Tour (with the first groups starting at 5 pm at the Liebesbier building).</p>

WEDNESDAY

9:00am - 9:45am <u>S57 (RW I)</u>	<p>PLS-SEM 1: Partial Least Squares Structural Equation Modeling Workshop - Introduction</p> <p>Partial Least Squares Structural Equation Modeling (PLS-SEM) by Marko Sarstedt on Wednesday, March 20, 2019, 9:00-17:00 Partial least squares structural equation modeling (PLS-SEM) has recently received considerable attention in a variety of disciplines, including marketing, strategic management, management information systems, and many more.PLS..</p>
9:00am - 9:45am <u>H24 (RW I)</u>	<p>Plenary: Archetypes, Prototypes and Other Types: The Current State and Prospects for Future Research by Francesco Palumbo (University of Naples Federico II, Italy)</p> <p>Session Chair: Adalbert Wilhelm</p>
9:45am - 11:00am <u>S57 (RW I)</u>	<p>PLS-SEM 2: Fundamentals of Measurement I</p>
9:45am - 11:00am <u>S58 (RW I)</u>	<p>Dimension Reduction 1</p> <p>Session Chair: Maurizio Vichi</p> <hr/> <p>Redundancy Analysis for Sparse Component Loadings</p> <p><u>Yuki Yamagishi</u>¹, <u>Hiroshi Yadohisa</u>²</p> <p>¹Graduate School of Culture and Information Science, Doshisha University; ²Department of Culture and Information Science, Doshisha University</p> <hr/> <p>Hierarchical Disjoint Principal Component Analysis</p> <p><u>Carlo Cavicchia</u>, <u>Maurizio Vichi</u>, <u>Giorgia Zaccaria</u> University of Rome La Sapienza, Italy</p> <hr/> <p>Zero-Inflated Negative Binomial Matrix Factorization</p> <p><u>Hiroyasu Abe</u> Kyoto University, Japan</p>
9:45am - 11:00am <u>S59 (RW I)</u>	<p>Machine Learning 4</p> <p>Session Chair: Josef Schosser</p> <hr/> <p>Locally Learned SVMs - The Regionalization Approach</p> <p><u>Florian Dumpert</u> University of Bayreuth, Germany</p> <hr/> <p>Hyperplane Folding - a Method for Handling Non-linear Relations in Support Vector Machines</p> <p><u>Lars Lundberg</u>, <u>Håkan Lennestad</u>, <u>Veselka Boeva</u>, <u>Eva Garcia-Martin</u> Blekinge Institute of Technology, Sweden</p> <hr/> <p>Predicting wine quality using machine learning techniques</p> <p><u>Stavros Dimitri Ioannidis</u>¹, <u>Dimitrios Avraam Ioannides</u>²</p> <p>¹Univ.of Patras; ²Univ.of Macedonia</p>
9:45am - 11:00am <u>S61 (RW I)</u>	<p>Data Analysis in Social Sciences 1</p> <p>Session Chair: Cristina Davino</p> <hr/> <p>Decision Support System for Road Safety Improvement</p> <p><u>Katherina Meißner</u> University of Hildesheim, Germany</p> <hr/> <p>Clustering and modeling data. A quantile regression approach</p> <p><u>Cristina Davino</u>, <u>Domenico Vistocco</u> University of Naples Federico II, Italy</p>
9:45am - 11:00am <u>S62 (RW I)</u>	<p>Data Analysis Models in Economics and Business 1 (organized by Józef Pociecha)</p> <p>Session Chair: Józef Pociecha</p>

	<p>Selecting the Optimal Multidimensional Scaling Procedure for Interval-valued Data with Symbolic-to-classic and Symbolic-to-symbolic Approaches <u>Marek Walesiak, Andrzej Dudek</u> Wroclaw University of Economics, Poland</p> <hr/> <p>Risk Factor Analysis of Companies Listed on the Warsaw Stock Exchange <u>Paweł Lula, Paweł Cabała, Renata Oczkowska, Jakub Kanclerz</u> Cracow University of Economics, Poland</p> <hr/> <p>Fuzzy representation of linguistic measurement in risk perception, preferences and attitudes classification <u>Józef Dziechciarz, Marta Dziechciarz Duda</u> Wroclaw University of Economics, Poland</p>
9:45am - 11:00am <u>S64 (RW I)</u>	<p>Social Network Analysis Session Chair: Alexandra Rese</p> <hr/> <p>Viral marketing in the event industry: An empirical study to determine factors influencing the viral distribution of events <u>Thomas Reichstein, Ines Brusch, Rebecca Meier zu Ummeln</u> BTU Cottbus-Senftenberg, Germany</p> <hr/> <p>The text mining and dimension reduction method application into exploring the isomorphic pressures in the corporate communications on the textual tweets' data on a sustainability within the energy sector <u>Adriana Paliwoda-Matiolańska¹, Emilia Smolak-Lozano², Atsuko Nakayama³</u> ¹Cracow University of Economics, Poland; ²University of Malaga, Spain; ³Tokyo Metropolitan University, Japan</p> <hr/> <p>An integration of time series model and multi-agent simulation <u>Eiji Motohashi¹, Sotaro Katsumata², Akihiro Nishimoto³</u> ¹Yokohama National University, Japan; ²Osaka University; ³Kwansei Gakuin University</p>
11:00am - 11:30am <u>Foyer RW I</u>	Coffee break
11:30am - 12:45pm <u>S57 (RW I)</u>	<p>PLS-SEM 3: Fundamentals of Measurement II</p> <hr/> <p>Dimension Reduction 2 Session Chair: Akinori Okada</p> <hr/> <p>Dimension Reduction for Qualitative Ideas in Innovation Search <u>Diana Schif¹, Ulrich Theodor Schwarz²</u> ¹BMW AG, Germany; ²Chemnitz University of Technology</p> <hr/> <p>Uncovering the Structure of Rank Data by its Coherent Groups <u>Vartan Choulakian</u> Université de Moncton, Canada</p> <hr/> <p>A feature selection method based on the naive Hotelling T^2 statistic <u>Mitsuru TAMATANI</u> Doshisha University, Japan</p>
11:30am - 12:45pm <u>S58 (RW I)</u>	<p>Machine Learning 5 Session Chair: Andreas Geyer-Schulz</p> <hr/> <p>Convolutional Neural Networks in Economics: Opportunities and Challenges <u>Marvin Schweizer, Abdolreza Nazemi, Andreas Geyer-Schulz</u> Karlsruhe Institute of Technology, Germany</p>

	<p>Deep Physiological Models for Pain Intensity Recognition <u>Patrick Thiam, Friedhelm Schwenker</u> Ulm University, Germany</p> <hr/> <p>Churn Analysis Using Deep Learning: Methods and Application <u>Tobias Albrecht, Daniel Baier</u> University of Bayreuth, Germany</p>
11:30am - 12:45pm <u>S61 (RW I)</u>	<p>Data Analysis in Social Sciences 2 Session Chair: <u>Θεόδωρος Χατζηπαντελης</u></p> <hr/> <p>Algorithmic Sources of Publication Bias in Political Science Research <u>Alrik Thiem, Lusine Mkrtchyan, David Sanchez</u> University of Lucerne, Switzerland</p> <hr/> <p>The involvement in politics via the social media channels: a multivariable analysis <u>Evangelia Nikolaou Markaki¹, Theodore Chadjipantelis²</u> ¹ARISTOTLE UNIVERSITY OF THESSALONIKI, Greece; ²ARISTOTLE UNIVERSITY OF THESSALONIKI, Greece</p> <hr/> <p>Visualization of latent higher-order interactions by regions of significance <u>Viktor Fredrich, Ricarda Bouncken</u> University Bayreuth, Germany</p>
11:30am - 12:45pm <u>S62 (RW I)</u>	<p>Data Analysis Models in Economics and Business 2 (organized by Józef Pociecha) Session Chair: <u>Jozef Dziechciarz</u></p> <hr/> <p>Logit leaf model in prediction of corporate bankruptcy <u>Barbara Pawełek, Józef Pociecha, Sebastian Grabarz</u> Cracow University of Economics, Poland</p> <hr/> <p>Empirical Bayes method for the estimation of wages of small enterprises <u>Grażyna Dehnel, Łukasz Wawrowski</u> The Poznań University Of Economics And Business, Poland</p> <hr/> <p>The Smart Development of German Government Regions (Regierungbezirke) 2005-2017 <u>Andrzej Sokołowski¹, Małgorzata Markowska²</u> ¹Cracow University of Economics, Poland; ²Wrocław University of Economics, Poland</p>
11:30am - 12:45pm <u>S64 (RW I)</u>	<p>Innovation Session Chair: <u>Michael Brusch</u></p> <hr/> <p>Forecasting Sales of Durable Goods – Does Search Data Help? <u>Carsten D. Schultz</u> University of Hagen, Germany</p> <hr/> <p>A new algorithm to optimize the development of innovative products and services <u>Gloria Gheno¹, Massimo Garbuio²</u> ¹Innovative data analysis, Italy; ²University of Sydney, Australia</p> <hr/> <p>Constructing an ideal workstream collaboration tool for coworking spaces using single-product choice-based conjoint measurement <u>Cristopher Siegfried Kopplin, Daniel Baier</u> University of Bayreuth, Germany</p>
12:45pm	Closing of the Conference

1:00pm - 1:45pm <u>Frischraum (Mensa)</u>	Lunch (Wednesday)
1:45pm - 3:00pm <u>S57 (RW I)</u>	PLS-SEM 4: Assessment of PLS-SEM: Results and Exercises I
3:00pm - 3:15pm <u>Foyer RW I</u>	Coffee break
3:15pm - 5:00pm <u>S57 (RW I)</u>	PLS-SEM 5: Assessment of PLS-SEM: Results and Exercises II; Outlook on Advanced Topics

Social Program

Welcome Reception

On Monday evening (7:00pm) there will be a Welcome Reception at the Richard Wagner Museum. The Richard Wagner museum is located in the Richard-Wagner-Street 48. Starting from the university, it can be easily reached by feet. Otherwise, you could take the bus lines 302 or 307 to "Wahnfried". Furthermore, we are offering guided tours every 10 minutes starting from 6:00pm. The Richard Wagner Museum Bayreuth is an important piece of German cultural heritage where the life, works and lasting influence of Richard Wagner are researched and presented in a unique ambience, and brought to life for in a multi-sensory experience. The authentic living and working environment and the tremendous cultural significance of the house with its turbulent, ambivalent and even dubious history, combined with the sheer sophistication of the sensory feast imparted by the permanent collection, as well as a wide variety of events and special exhibitions, make repeated visits to the Museum an inspirational experience for cognoscenti and laymen alike. From the very beginning, the Museum in Wahnfried House has been one of the most important attractions both in the city and the region for visitors from around the world, not least due to its prestigious rooms, and the permanent exhibition containing numerous exhibits drawn from the life, works and influence of Richard Wagner. Of particular interest are those originating from the City of Bayreuth's Richard Wagner Memorial collection from 1925 that was moved in its entirety to the Richard Wagner Museum collection in Wahnfried House in 1976. It is an outstanding cultural site, which in 2006 was granted the accolade "Place of Ideas" as part of the "Germany – Land of Ideas" initiative under the patronage of the President of the Federal Republic of Germany.

City Tour

Our City Tour will guide you from the university to the Villa Wahnfried, the New Castle of Bayreuth, the Margravial Opera House and the Old Castle of Bayreuth. The tour will take approximately 40 minutes.

Brewery Tour

After the last sessions on Tuesday (4:25pm) there will be guided City Tours taking you to the restaurant "Liebesbier", where our Conference Dinner will take place. Starting from the university, the first tours will be departing at 4:25pm, 4:35pm and 4:45pm. Alternatively, our bus shuttle to the hotels ARVENA, Rheingold, Bayerischer Hof and to Brewery will be departing at 4:30pm (starting at the ZUV Bus Stop) and 6:00pm. The walking tours take about 40 min.

The Brauereimuseum (brewery museum) with its historic brick façade provides insight into the history of brewing culture. Everything still works as if the brewers and coopers had just taken their lunch break: the machine house, brewhouse, hops room and coolships. The Maisel's Brauereimuseum already earned a spot in the Guinness Book of Records in 1988 for being the most diverse beer museum. Other highlights include two large cabinet vaults showcasing over 5,500 beer glasses and mugs, the 400 rare enamel signs from different breweries and brands of beer as well as an impressive collection of coasters.

At the end of the roughly 60-minute tour, guests can taste Franconian craft brewing at its finest in the adjacent Liebesbier pub and restaurant. Patrons are seated right in the heart of the brewery where they can watch the master brewers practice their art. 21 different beers on tap and 60 to 80 bottled beers testify to the true love for beer as well as the innovation and pioneering spirit of Franconia. The beer garden is open for guests in the summertime.

Conference Dinner

On Monday evening (7:00pm-10:00pm) our Conference Dinner will take place in the Restaurant Liebesbier (ground floor of Maisel&Friends Brewery, Andreas-Maisel-Weg 1, 95445 Bayreuth, see <https://www.liebesbier.de/>) with Franconian dishes.

„Nightlife“ in Bayreuth

Locations to go after the Welcome Reception on Monday

Below we give you some inspiration for having a drink, something to eat or a nice conversation after our Welcome Reception on Monday (18 March 2019):



Enchilada Bayreuth

📍 **Address:** Hindenburgstraße 3, 95445 Bayreuth

💡 **About:** Mexican Restaurant close to the city center.

⌚ **Opening hours:** 17:00 - 01:00



Café Kraftraum

📍 **Address:** Sophienstraße 16, 95444 Bayreuth

💡 **About:** Cozy Restaurant and Café with food from all around the world.

⌚ **Opening hours:** 08:00 - 01:00



L'Osteria Bayreuth

📍 **Address:** Maximilianstraße 83, 95444 Bayreuth

💡 **About:** Italian Restaurant known for its large Pizzas.

⌚ **Opening hours:** 11:30 - 23:00



RoxyBurger

📍 **Address:** Hindenburgstraße 2, 95445 Bayreuth

💡 **About:** American styled Burger Restaurant.

⌚ **Opening hours:** 11:30 - 00:00

Lamperie

📍 **Address:** Friedrichstraße 13, 95444 Bayreuth

💡 **About:** Pub with a nice atmosphere and a big selection of Franconian beers.

⌚ **Opening hours:** 17:00 - 00:00

Bayreuther Trichter

📍 **Address:** Badstraße 6, 95444 Bayreuth

💡 **About:** Traditional Bar and Lounge.

⌚ **Opening hours:** 19:00 – 01:00

Kilian's Irish Pub

📍 **Address:** Von-Römer-Straße 5, 95444 Bayreuth

💡 **About:** Traditional Irish Pub with Darts, Kicker, Snacks and of course beer.

⌚ **Opening hours:** 18:00 - 01:00

Kanapee

📍 **Address:** Maximilianstraße 29, 95444 Bayreuth

💡 **About:** Casual and cozy Pub. Known for its wide sortiment of shots (especially the so called „Totengräber“).

⌚ **Opening hours:** 20:00 - 05:00

Palace - Drinks, Lounge & Shisha

📍 **Address:** Kanzleistr. 4, 95444 Bayreuth

💡 **About:** Cozy Shisha Bar with fancy drinks.

⌚ **Opening hours:** 16:00 - 01:00



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