

Volker Wohlgemuth
Frank Fuchs-Kittowski
Jochen Wittmann



EnviroInfo 2016

Environmental Informatics – Stability, Continuity, Innovation

Current trends and future perspectives
based on 30 years of history

Adjunct Proceedings of the 30th edition of the EnviroInfo – the long standing and established international and interdisciplinary conference series on leading environmental information and communication technologies

Berlin, September 14th – 16th, 2016
HTW Berlin, University of Applied Sciences, Germany

SHAKER
VERLAG



htw.

**Hochschule für Technik
und Wirtschaft Berlin**

University of Applied Sciences

EnviroInfo 2016 Organizers

Chairs

Prof. Dr. Volker Wohlgemuth

Hochschule für Technik und Wirtschaft Berlin, Germany

Prof. Dr.-Ing. Frank Fuchs-Kittowski

Hochschule für Technik und Wirtschaft Berlin, Germany

Prof. Dr.-Ing. Jochen Wittmann

Hochschule für Technik und Wirtschaft Berlin, Germany

Program Committee

Arndt, Hans-Knud

Bartoszczuk, Pawel

Brüggemann, Rainer

Düpmeier, Clemens

Fischer-Stabel, Peter

Fuchs-Kittowski, Frank

Funk, Burkhardt

Geiger, Werner

Göbel, Johannes

Greve, Klaus

Hilty, Lorenz M.

Hitzelberger, Patrik

Hönig, Timo

Jensen, Stefan

Karatzas, Kostas

Kern, Eva

Kleinhans, David

Knetsch, Gerlinde

Knol, Onno

Kremers, Horst

Lang, Corinna

Lorenz, Jörg

Mattern, Kati

MacDonell, Margaret

Marx Gómez, Jorge

Möller, Andreas

Müller, Berit

Müller, Ulf Philipp

Naumann, Stefan

Niemeyer, Peter

Niska, Harri

Ortleb, Heidrun

Page, Bernd

Pattinson, Colin

Pillmann, Werner

Rapp, Barbara

Riekert, Wolf-Fritz

Schade, Sven

Schreiber, Martin

Schweitzer, Christian

Simon, Karl-Heinz

Sonnenschein, Michael

Susini, Alberto

Thimm, Heiko

Vogel, Ute

Voigt, Kristina

Wagner vom Berg, Benjamin

Widok, Andi

Winter, Andreas

Wittmann, Jochen

Wohlgemuth, Volker

Conference Homepage

<http://enviroinfo2016.org/>

Preface

This book covers selected keynotes, short papers and work in progress papers of the 30th edition of the long standing and established international and interdisciplinary conference series on leading environmental information and communication technologies (EnviroInfo 2016). The conference was held in September 14 - 16, 2016 at the Hochschule für Technik und Wirtschaft Berlin (HTW Berlin), University of Applied Sciences. The EnviroInfo conference series under the patronage of the Technical Committee on Environmental Informatics of the German Informatics Society looks back on a history of 30 conferences. Thus, one important thread in Berlin was a retrospective on the experiences made and the lessons learned in the field of environmental informatics during the last years. Basic topics that were covered under the central focus “Environmental Informatics – Current trends and future perspectives based on 30 years of history” were applications of geographical information systems, environmental modelling and simulation, risk management, material and energy flow management, climate change, tools and database applications and other aspects with regard to the main topic ICT and the environment.

Due to the interdisciplinary character of environmental informatics, one important goal of this conference was to bring experts from industry, research and education together to exchange ideas and proposals for solution of urgent problems and needs in the field on environmental protection and its IT-support.

The editors would like to thank all contributors to the conference and these conference proceedings. Special thanks also go to the members of the programme and organizing committee. Especially, we want to thank all “helping hands” and students of the HTW Berlin. Last, but not least, a warm thank you to our sponsors and to the HTW Berlin for being the host of this year’s conference.

Volker Wohlgemuth
Frank Fuchs-Kittowski
Jochen Wittmann
Berlin, August 2016

Unterstützer



Table of Contents

KEYNOTES.....	1
HOW INTEGRATING MODELS AND SENSORS CAN BRIDGE THE GAPS TOWARDS A HOLISTIC ASSESSMENT OF ENVIRONMENTAL AND PUBLIC HEALTH.....	3
<i>Stefan Reis</i>	
CLOSING THE GAP: CONNECTING ENVIRONMENTAL INFORMATICS TO THE PEOPLE WHO REALLY NEED IT	7
<i>Steven P. Frysinger</i>	
SATELLITE REMOTE SENSING BASED TOOLS AND APPLICATIONS FOR ENVIRONMENTAL ASSESSMENT	13
COPERNICUS DATA LOOKING FOR APPLICATIONS - OPPORTUNITIES FOR ENVIRONMENTAL INFORMATICS	15
<i>Patrik Hitzelberger, Paulo Carvalho</i>	
SENTHIS – SENTINELS OF THURINGIAN INFORMATION SYSTEMS.....	21
<i>Sandra Naue, Peter Krause</i>	
SUSTAINABLE MOBILITY	27
INTEGRATION OF INCLUSIVENESS INTO SUSTAINABLE MOBILITY PLANNING FOR SMALL MUNICIPALITIES	29
<i>Petra Busswald, Franz Niederl, Bente Knoll, Roswitha Hoffmann, Ralf Dopheide</i>	
WHAT DRIVES PROFITABILITY OF ELECTRIC VEHICLES IN MIXED FLEETS? – AN EMPIRICAL ANALYSIS BASED ON DATA LOGGER INFORMATION	35
<i>Daniela Mau, Jonas Tostmann, David M. Woisetschläger, Nadine Pieper</i>	
TOWARDS A SUSTAINABLE SOFTWARE ARCHITECTURE FOR THE NEMO MOBILITY PLATFORM	41
<i>Jan Jelschen, Christoph Küpker, Andreas Winter, Alexander Sandau, Benjamin Wagner vom Berg, Jorge Marx Gómez</i>	
PRODUCT ACCEPTANCE BY SERVICE USAGE – THE IMPACT OF E-CARSHARING ON THE PERCEPTION OF ELECTRIC VEHICLES.....	49
<i>Christoph Weiß, David M. Woisetschläger</i>	
ENVIRONMENTAL MANAGEMENT INFORMATION SYSTEMS (EMIS).....	53
TOWARD GREEN DECISION MAKING THROUGH DECISION EVALUATION SYSTEM.....	55
<i>Abdelkerim Rezgui, Jorge Marx Gómez</i>	
HISTORY	65

THE EMISSION BALANCE OF HUGO RITTER VON PERGER	67
<i>Susanne G. Draxler and Gerald J. Benz</i>	
SEMANTIC NETWORK SERVICE – RELAUNCH AFTER 15 YEARS	73
<i>Joachim Fock, Thomas Bandholtz, Marc Jansing</i>	
MORE THAN TWO DECADES OF GENERIC APPROACH FOR DATABASE APPLICATIONS IN THE ENVIRONMENTAL FIELD	79
<i>Ulrich Hussels, Alexios Camarinopoulos, Sephanos Camarinopoulos, Georgios Pamboukis, Theodora Karali</i>	
8. BUIS-TAGE: 18. TAGUNG DER FACHGRUPPE BETRIEBLICHE UMWELTINFORMATIONSSYSTEME DER GESELLSCHAFT FÜR INFORMATIK E.V.	
85	
MOPS – AKTUELLE ENTWICKLUNGSTENDENZEN BEI DER MOBILEN SOFTWARETECHNISCHEN UNTERSTÜTZUNG EINES PROZESSORIENTIERTEN STOFFSTROMMANAGEMENTS IN KMU.....	87
<i>Maximilian Schneider, Volker Wohlgemuth</i>	
POTENTIALE UND HERAUSFORDERUNGEN EINES INTERAKTIVEN KENNZAHLENDITORS FÜR EINE STAKEHOLDERORIENTIERTE NACHHALTIGKEITSBERICHTERSTATTUNG	93
<i>Andreas Solsbach, Barbara Rapp, Jorge Marx Gómez</i>	
PROTOTYPISCHE UMSETZUNG EINER WEBANWENDUNG ZUR BEURTEILUNG VON STOFF- UND ENERGIESTRÖMEN AM STANDORT BERLIN-SCHÖNEWEIDE	99
<i>Jeffrey Große, Andrej Matusevicus, Volker Wohlgemuth</i>	
EVALUATION EINES METHODENBAUKASTENS ZUR RISIKOINTEGRIERTEN VERBESSERUNG VON PROZESSEN DES OFFSHORE WINDPARK-BETRIEBS.....	107
<i>Saskia Greiner, Jorge Marx Gómez, Henning Albers</i>	
ENVIRONMENTAL INFORMATICS – ENVISION CONCEPTS, PRESENT APPROACHES AND DISCUSS IMPLEMENTATIONS (PHD WORKSHOP)	
113	
ADAPTIVE DAY-AHEAD PLANNING FOR PCU-SUPPORTED ELECTRIC VEHICLES.....	115
<i>Dominik Schöner</i>	
DISASTER MANAGEMENT FOR RESILIENCE AND PUBLIC SAFETY.....	
121	
DEVELOPING SCENARIOS FOR THE COORDINATION OF CIVILIAN HELPERS.....	123
<i>Agnetha Schuchardt, Roman Peperhove</i>	
ENSURE – INCREASING RESILIENCE THROUGH THE INVOLVEMENT OF VOLUNTARY HELPERS.....	131

<i>Michael Jendreck, Ulrich Meissen, Michel Rösler, Eridy Lukau, Frank Fuchs-Kittowski</i>	
EMERGENCE AS A CHARACTERISTIC OF RESILIENT COOPERATION TECHNOLOGIES.....	141
<i>Christian Reuter</i>	
CHALLENGES IN INVESTING INTO ALERTING SYSTEMS UNDER BUDGETARY AND GEOGRAPHICAL CONSTRAINTS	145
<i>Michael Klaffit</i>	
RECEPTION OF TERROR IN GERMANY – SECURITY, PRIVACY AND SOCIAL MEDIA	151
<i>Christian Reuter, Robin Gellert, Gordian Geilen</i>	
CONVERSTATIONS I.....	157
DIGITAL PLATFORM FOR ELECTRICITY AND MOBILITY: UNIFYING THE TWO DOMAINS..	159
<i>Olga Levina</i>	
DESIGN PATTERNS IN MATERIAL AND ENERGY FLOW NETWORK MODELS	165
<i>Christian Hasenstab</i>	
LAND CAPABILITY CLASSIFICATION - ASSESSMENT OF CARRYING CAPACITY AND UTILIZATION INTENSITY	171
<i>Ahmed Harb Rabia</i>	
VALUATION OF STORAGE UNDER ZONAL PRICING MARKET STRUCTURE – CASE STUDY: ITALY.....	177
<i>Bogdan Oprescu, Sylvain Quoilin</i>	
GIS-BASED ANALYSIS OF MOBILITY DATA OF COURIERS IN BERLIN CONCERNING VEHICLE TYPE AND DISTRICT.....	187
<i>Christoph Bork, Lars-Benjamin Neupert, Jochen Wittmann</i>	
INFORMATION AND GAMING WEB-APPLICATION SUPPORTING ENERGY EFFICIENT RENOVATION PROCESS IN AN ENERGETICALLY OUTDATED SOCIAL RESIDENTIAL AREA ..	191
<i>Grit Behrens, Sven Alexander Ertelt, Florian Steckel, Fabian Witthaus, Frank Hamelmann, Thorsten Försterling</i>	
EVALUATION OF MESSENGER DESIGN: RELATION OF DESIGN-QUALITY AND SUCCESS ..	197
<i>Peter Kretschmer, Hristo Koychev, Hans-Knud Arndt</i>	
SPE-SOA: TOWARDS RESOURCE CONSUMPTION-AWARE MIGRATION TO CLOUD BASED APPLICATIONS.....	205
<i>Ola Wasef Mustafa, Jorge Marx Gómez</i>	
VIEWPOINTS FOR SENSOR BASED ENVIRONMENTAL INFORMATION SYSTEMS	211
<i>Ruthbetha Kateule, Andreas Winter</i>	

SUSTAINABLE HUMAN DEVELOPMENT: A CONCEPTUAL MODEL FOR TRANSDISCIPLINARY ANALYSIS	219
<i>Stanislas Bigirimana</i>	
AN INTEROPERABLE GEOSPATIAL SMART CITY AND REGION PLATFORM BASED ON IGUESS®	225
<i>Christian Braun, Ulrich Leopold</i>	
CONVERSTATIONS II	231
MOBILE CROWDSOURCING OF WATER LEVEL DATA.....	233
<i>Frank Fuchs-Kittowski, Sarah Bartusch, Bernd Pfützner, Fabian Fischer</i>	
OFFSHORE WIND FARM MAINTENANCE DECISION SUPPORT	241
<i>Fariba Mostajeran, Philip Joschko, Johannes Göbel, Bernd Page, Silke Eckardt, Torsten Renz</i>	
TRADEOFFS BETWEEN QOS AND ENERGY CONSUMPTION IN SDN NETWORKS AND THE DESIGN OF EQCONTROLLER	249
<i>Ammar AlSous, Jorge Marx Gómez</i>	
DECISION SUPPORT WITH WEATHER STATISTICS AND SIMULATION SOFTWARE FOR OFFSHORE WIND FARMS	255
<i>Dirk Bendlin, Jorge Marx Gómez, Gerrit Wolken-Möhlmann</i>	
EFFECT OF ZINC ON PIGMENTS CONTENT IN THREE NAVY BEAN (PHASEOLUS VULGARIS L.) VARIETIES GROWN IN SAND CULTURE.....	263
<i>Ahmed Harb Rabia</i>	
GROUNDWATER MONITORING AT THE AIRPORT BERLIN-TEGEL (TXL)	269
<i>Maximilian Dolling, Martin Engelmann, Jochen Wittmann</i>	
ERGONOMIC SOFTWARE DEVELOPMENT CONSIDERING SUSTAINABLE PHILOSOPHY	275
<i>Roksolana Pleshkanovska, Hans-Knud Arndt</i>	
A NEW APPROACH FOR SUSTAINABILITY OF SUSTAINABLE REPORTS	281
<i>Stefanie Lehmann, Peter Krummhaar, Hans-Knud Arndt</i>	
HEALTH-FOOD SHOPS AND VEGAN RESTAURANTS IN BERLIN IN CORRELATION WITH SELECTED SOCIAL FACTORS	287
<i>Katrin Bielert, Caroline Ganzel, Maria Ressel, Maria Sarah Wersche, Jochen Wittmann</i>	
WILL IT FIT? – A PRACTICE-ORIENTED APPROACH TO REDUCE CO2 EMISSIONS IN PARCEL SERVICE.....	293
<i>Stefan Wunderlich, Gerrit Berghaus, René Kessler, Alexander Sandau</i>	

LIFE CYCLE ASSESSMENT AND ICT.....	299
METHODOLOGICAL IMPLICATIONS OF TRACKING UNCERTAINTY FROM AN AGENT BASED MODEL TO A LIFE CYCLE IMPACT ASSESSMENT	301
<i>Paul Baustert, Tomás Navarrete Gutiérrez, Antonino Marvuglia</i>	
DESIGN, SUSTAINABILITY & ICT	307
TOWARDS AN OPEN PLATFORM FOR ESTABLISHING SUSTAINABLE ICT PRODUCTS	309
<i>Jad Asswad, Georg Hake, Jorge Marx Gómez</i>	
ENERGY AWARE SOFTWARE – ENGINEERING AND DEVELOPMENT	315
BENCHMARKING THE ENERGY CONSUMPTION OF SOFTWARE SYSTEMS.....	317
<i>Christian Bunse</i>	
OLIVIAMD – A SUPPORTIVE ONLINE PLATFORM FOR THE VISUALIZATION AND ANALYZATION OF MEASUREMENT DATA	323
<i>Dominik Trumm, Andreas Filler, Eva Kern, Stefan Naumann</i>	
THE NARROW WAY: CONSTRUCTIVE MEASURES AT OPERATING-SYSTEM LEVEL FOR LOW ENERGY USE.....	329
<i>Timo Hönig, Benedict Herzog, and Wolfgang Schröder-Preikschat</i>	
TEEC:IMPROVING POWER CONSUMPTION ESTIMATION OF SOFTWARE	335
<i>Hayri Acar, Gülfem I. Alptekin, Jean-Patrick Gelas, Parisa Ghodous</i>	
ENERGY AND WATER SYSTEMS.....	343
A BENCHMARKING METHODOLOGY TO IDENTIFY FAIR CONTRIBUTIONS OF DIFFERENT REGIONS TO THE ENERGY TRANSITION	345
<i>Günter Wind, Ernst Schriebl, Horst Lunzer, Petra Busswald, Franz Niederl</i>	
ENERGY SYSTEM MODELLING – BARRIERS, CHALLENGES AND GOOD PRACTICE IN OPEN SOURCE APPROACHE.....	353
USING MODELLING APPROACHES TO IMPROVE RENEWABLE ENERGY PRODUCTION IN THE REGIONAL SECTOR	355
<i>Mohamad Hamed, Jorge Marx Gómez</i>	
THE CORE CONCEPT OF THE OPEN ENERGY MODELLING FRAMEWORK (OEMOF).....	361
<i>Clemens Wingenbach, Simon Hilpert, Stephan Günther</i>	
HESYSOPT – AN OPTIMIZATION TOOL SUPPORTING DISTRICT HEATING SYSTEM FLEXIBILISATION.....	367
<i>Simon Hilpert</i>	

EVALUATION OF REGIONAL CO ₂ REDUCTION STRATEGIES IN THE HEATING SECTOR USING OPEN MODELS AND OPEN DATA – EXAMPLE: BERLIN	373
---	-----

Uwe Krien, Berit Müller

UMWELTINFORMATIONSSYSTEME – STRATEGISCHE INSTRUMENTE DES NACHHALTIGEN UMWELT- UND KLIMASCHUTZES 381

OPEN DATA - VISION ODER REALITÄT DIE SICHT DER UMSETZUNG IN EINER BUNDESBEHÖRDE	383
---	-----

Gerlinde Knetsch

AUF DEM WEG ZUM LINKED DATA AM BEISPIEL DES GSBL (INFORMATIONSSYSTEM CHEMIKALIEN DES BUNDES UND DER LÄNDER).....	389
--	-----

Gunnar Minx

MONITORING IM KOMMUNALEN KLIMASCHUTZ	393
--	-----

Franz Niederl, Petra Busswald, Stefan Schäfer, Jan Schwarz, Dag Schulze

GREEN IT – NACHHALTIGKEIT VON SMARTPHONE BIS RECHENZENTRUM	397
--	-----

Erik Heyden

MODERNE GIS-INFRASTRUKTUR UND SERVICES FÜR DIE UMWELT.....	401
--	-----

Stefan Weinberger, Mark Vetter

WATERBODY AND NUTRIENT INFORMATION SYSTEM SCHLESWIG-HOLSTEIN.....	407
---	-----

Friedhelm Hosenfeld, Michael Trepel, Johannes Tiffert

AKTUELLE WEITERENTWICKLUNGEN VON CADENZA MOBILE FÜR DAS MOBILE ARBEITEN MIT GEODATEN IN DER ÖFFENTLICHEN VERWALTUNG	413
---	-----

Jens Lübke, Boris Terzic, Andreas Abecker, Claus Hofmann, Wassilios Kazakos

ENVIRONMENTAL HEALTH INFORMATICS..... 419

INFLUENCE OF INTERNATIONAL TRADE ON REGIONAL HUMAN DEVELOPMENT AND RELATIONSHIP WITH ENVIRONMENTAL AND HEALTH IMPACTS.....	421
--	-----

Thomas Gibon, Antonino Marvuglia, Enrico Benetto

GIS-BASED ANALYSIS OF THE AIR AND NOISE POLLUTION OF BERLINS ALLOTMENT GARDENS	429
--	-----

Vladimir Degtiar, Karsten Fuhrmann, Jochen Wittmann

GERMANY SURROUNDED BY IONIZING RADIATION SOURCES FROM AGING NUCLEAR POWER PLANTS - UPDATE OF FRENCH DATA 2012 - 2014	437
--	-----

Hagen Scherb, Kristina Voigt

ABOUT RENTAL PRICES AND AIR QUALITY, A CORRELATION	443
--	-----

Florian Hübner, Lisa-Kristin Richter, Jochen Wittmann

ICT ROLE IN FOOD SECURITY AND FOOD SAFETY	449
<i>Walter Armbruster, Margaret MacDonell</i>	
ENVIRONMENTAL INFORMATICS AND ECONOMICAL ASPECTS	457
DYNAMIC MODELING FRAMEWORK FOR ANTHROPOGENIC STOCKS AND FLOWS TO ENHANCE THE CIRCULAR ECONOMY	459
<i>Felix Müller, Ingo Meinshausen & Andreas Möller</i>	
THE CO ₂ EMISSION PERMITS MARKET SIMULATION USING CONTINUOUS DOUBLE AUCTION	467
<i>Jaroslaw Stanczak, Pawel Bartoszczuk</i>	
SYSTEMS THINKING FOR SUSTAINABLE DEVELOPMENT: RETHINKING BUSINESS PERFORMANCE	475
<i>Stanislas Bigirimana</i>	
ECOINNOVATION MODELING: POLISH APPROACH	481
<i>Pawel Bartoszczuk</i>	
THE POLITICAL AND ECONOMIC POWER OF OPEN ENVIRONMENTAL INFORMATION	489
<i>Werner Pillmann, Rudolf Legat</i>	
ON THE IMPORTANCE OF SYSTEMS METHODS AND SYSTEMS ANALYSIS IN ENVIRONMENTAL RESEARCH	497
THE VALUE OF SCIENTIFIC INFORMATION ON CLIMATE SENSITIVITY UNCERTAINTY	499
<i>Shunsuke Mori and Hideo Shiogama</i>	
SALINIZATION MODELING AS AN IMPACT OF IRRIGATION SYSTEM MODERNIZATION: FROM SURFACE TO DRIP IRRIGATION	507
<i>Ahmed Harb Rabia</i>	
AUTHOR INDEX	513