

# Ingo Frommholz

PhD (Dr. rer. nat.)  
Diplom-Informatiker  
FBCS, FHEA

School of Computer Science and Technology  
University of Bedfordshire  
Park Square  
Luton LU1 3JU  
United Kingdom  
✉ [ifrommholz@acm.org](mailto:ifrommholz@acm.org)  
🌐 <http://www.frommholz.org/>

---

## Research Interests

- Formal methods for user-oriented information retrieval and access in information systems (for instance based on quantum probabilities and quantum theory), annotation-based retrieval and semantic search
- Machine learning and information retrieval
- Text categorization and clustering
- Database and information retrieval integration
- Cyberstalking detection in social media
- Application of information retrieval in, e.g., digital humanities, digital libraries, bibliometrics, recommender systems, augmented reality, data science and big data

---

## Education

- 2012 **Postgraduate Certificate in Academic Practice (PgCAP)**, *University of Bedfordshire*, Luton, UK.  
60 credit Masters-level programme designed to both support and enhance the engagement of academic staff with their academic responsibilities.
- 2008 **PhD (Dr. rer. nat.) in Computer Science**, *University of Duisburg-Essen*, Duisburg, Germany.  
Thesis: *A Probabilistic Framework for Information Modelling and Retrieval Based on User Annotations on Digital Objects*. First examiner: Prof. Dr. Norbert Fuhr, 2nd examiner: Prof. Dr. Maristella Agosti. **German highest grade (summa cum laude)**.
- 2007 **Certificate in professional teaching competence in higher education**, *University of Duisburg-Essen*, Duisburg, Germany.  
The 200 hours training programme addressed teaching and learning, testing, advising and counselling, evaluating, and innovatively developing study programmes and teaching strategies.
- 2001 **Diploma in Computer Science (Diplom-Informatiker, MSc equivalent)**, *University of Dortmund*, Germany.  
Thesis: *Automatic categorisation of Web documents*. Examiner: Prof. Dr. Norbert Fuhr.  
Main courses during studies: Operating Systems, Computer Networks and Distributed Systems, Databases, Information Retrieval, Business Informatics. **German highest grade (1.0)**.

---

## Professional Experience

- 02/2011–Present **Lecturer/Senior Lecturer**, *Department of Computer Science and Technology, University of Bedfordshire*, Luton, UK.  
02/2011-07/2012 Lecturer, appointed Senior Lecturer 08/2012
- 10/2012–Present **Search and Data Science Consultant**, *Self Employed*, London, UK.
- 11/2008–01/2011 **Postdoctoral Research Associate**, *Information Retrieval Group, School of Computing Science, University of Glasgow*, Glasgow, Scotland.

- 10/2004–10/2008 **Research Assistant**, *Information Systems Group, Faculty of Engineering Sciences, University of Duisburg-Essen*, Duisburg, Germany.
- 3/2006–4/2006 **Visiting researcher**, *Information Management Systems Research Group, University of Padua*, Italy.
- 3/2001–9/2004 **Research Assistant**, *Fraunhofer Integrated Publication and Information Systems Institute (IPSI)*, Darmstadt, Germany.
- 11/1999–2/2001 **Software Developer**, *adesso GmbH*, Dortmund, Germany.  
Part time whilst at university.
- 5/1998–10/1999 **Software Developer**, *o.tel.o GmbH*, Düsseldorf, Germany.  
Part time whilst at university.
- 8/1994–4/1998 **Software Developer**, *Lion Ges. für Systementwicklung mbH*, Bochum, Germany.  
Part time whilst at university.

---

## Research and Consultancy Projects

- since 2017 **QUARTZ**, *University of Bedfordshire*, Luton, UK.  
EU H2020 Marie Curie ITN European Training Network on quantum-based information access and retrieval. PI.
- 2016–2017 **EDISON**, *University of Bedfordshire*, Luton, UK.  
EU H2020 Coordination and Support Action with the purpose of accelerating the creation of the Data Science profession. UoB participates as Data Science Champion University, which I initiated.
- since 2012 **NotActivelyLooking.com**.  
Consultancy project on the design and implementation of a search engine for executives (in collaboration with industry partners). Principle investigator and main software developer.
- 2016–2017 **Wardown Park Talking Objects**, *University of Bedfordshire*, Luton, UK.  
Digital Humanities project combining augmented reality and conversational information retrieval (with Luton Culture). PI.
- 2015 **EduVocation**, *University of Bedfordshire*, Luton, UK.  
Teacher recruitment site and information system based on linked open data (UK Innovation Voucher). PI.
- 2013–2015 **Luton Culture World War I project**, *University of Bedfordshire*, Luton, UK.  
Digital Museum and Linked Data project on World War I in conjunction with Luton Museum (AHRC grant, PI).
- 2008–2011 **RENAISSANCE**, *University of Glasgow*, Glasgow, UK.  
EPSRC project on retrieval models based on the quantum theory framework. Main task: evaluation and further extension of an interactive retrieval framework inspired by quantum mechanics.
- 2010–2011 **QONTEXT**, *University of Glasgow*, Glasgow, UK.  
EU Marie Curie FP7-IRSES project on information retrieval and quantum theory. Contributed to the successful research proposal.
- 2008 **LACOSTIR**, *University of Duisburg-Essen*, Duisburg, Germany.  
German Research Foundation project on interactive retrieval. Main tasks: specification of a model for interactive retrieval.
- 2006–2007 **DELOS**, *University of Duisburg-Essen*, Duisburg, Germany.  
EU-FP6 Network of Excellence on Digital Libraries. Main task: design and integration of annotation services into the agent-based Daffodil framework.
- 2006 **KIIB**, *University of Duisburg-Essen*, Duisburg, Germany.  
EU-EUREGIO project on business processes and email classification, in collaboration with d.velop AG, Gescher, Germany. Main task: knowledge transfer, development of a study on email classification in a helpdesk scenario. Main contributor to the successful research proposal.
- 2004–2006 **CLASSIX**, *University of Duisburg-Essen*, Duisburg, Germany.  
German Research Foundation (DFG) project on classification and intelligent search on information in XML. Main task: specification and implementation of an annotation-based retrieval framework for structured documents based on probabilistic logics.

- 2004 **BRICKS**, *Fraunhofer IPSI*, Darmstadt, Germany.  
EU-FP6 integrated project on distributed resources for integrated cultural knowledge services.  
Main task: specification of annotation services.
- 2002–2003 **VIP-ADVISOR**, *Fraunhofer IPSI*, Darmstadt, Germany.  
EU-FP5 project (IST-2001-32440) on a virtual advisor for personal insurance and finance risk management. Main task: integration of case-based retrieval services for advisory dialogues.
- 2001–2003 **COLLATE**, *Fraunhofer IPSI*, Darmstadt, Germany.  
EU-FP5 project (IST-1999-20882) on the development of a collaboratory for annotation, indexing and retrieval of digitized historical archive material. Main task: design and implementation of context-based retrieval methods based on user annotations, of retrieval Web services and of research prototypes.
- 2001–2003 **SCHOLNET**, *Fraunhofer IPSI*, Darmstadt, Germany.  
EU-FP5 project (IST-1999-20664) on a digital library infrastructure for supporting communication and collaboration among networked scholarly communities. Main task: design and implementation of search user interfaces.

---

## Invited Talks and Tutorials

- 2014, 2015 and 2016 **Information Retrieval and Foraging Autumn School**, Germany.  
Tutorial on information retrieval models.
- 2012 **Information Retrieval Autumn School**, *Schloss Dagstuhl*, Germany.  
Tutorial on quantum probabilities and quantum information access and retrieval.

---

## Research Related and Administrative Activities

### Chair and Senior PC Member, Mentoring

- 2019 **European Conference on Information Retrieval (ECIR 2019)**, *Cologne*, Germany.  
Publicity Chair.
- 2018 **European Conference on Information Retrieval (ECIR 2018)**, *Grenoble*, France.  
Publicity Chair.
- 2018 **ACM SIGIR International Conference on the Theory of Information Retrieval (ICTIR 2018)**, *Tianjin*, China.  
Publicity Chair.
- 2016 **ACM/IEEE Joint Conference on Digital Libraries (JCDL 2016)**, *Newark*, NJ, USA.  
Publicity Chair.
- 2016 **International Conference on Theory and Practice of Digital Libraries (TPDL 2016)**, *Hannover*, Germany.  
Tutorial chair.
- 2015–2018 **IR workshops at Lernen–Wissen–Adaptivität (LWA-WIR)**.
- 2009–2012 Programme chair of the IR workshops held by the IR Special Interest Group of the German Computing Society (GI) in 2009 (Darmstadt), 2010 (Kassel), 2011 (Magdeburg), 2012 (Dortmund), 2015 (Trier), 2016 (Potsdam).
- 2015 **European Conference on Information Retrieval (ECIR 2015)**, *Vienna*, Austria.  
Student mentor.
- 2015 **ACM/IEEE Joint Conference on Digital Libraries (JCDL 2015)**, *Knoxville*, Tennessee, USA.  
Senior PC member.
- 2014 **DL2014: ACM/IEEE Joint Conference on Digital Libraries (JCDL 2014) / International Conference on Theory and Practice of Digital Libraries (TPDL2014)**, *London*, UK.  
Senior PC member and chair of the best student paper committee. In 2014 JCDL and TPDL were held together as the International Digital Libraries Conference (DL2014).

- 2013 **International Conference on Theory and Practice of Digital Libraries (TPDL 2013)**, *Valletta*, Malta.  
Panel chair.
- 2012 **International Conference on Theory and Practice of Digital Libraries (TPDL 2012)**, *Cyprus*.  
Member of the metareview committee.
- 2011 **International Symposium on Quantum Interaction (QI 2011)**, *Aberdeen*, Scotland.  
Proceedings chair.
- 2010 **European Conference on Research and Advanced Technology for Digital Libraries (ECDL 2010)**, *Glasgow*, Scotland.  
Local chair.

### Organiser

- 2016–2018 **Search Solutions**, *London*, UK.  
Co-organiser of the BCS Search Solutions Conference on Innovations in Search & Information Retrieval.
- 2016 **The Joint Workshop on Bibliometric-enhanced Information Retrieval and Natural Language Processing for Digital Libraries (BIRNDL 2016)**, *New Jersey*, USA.  
Co-organiser of the workshop held at JCDL 2016.
- 2018 **5th International Workshop on Bibliometric-enhanced Information Retrieval (BIR2018)**, *Grenoble*, France.  
Co-organiser of the workshop held at ECIR 2018.
- 2017 **4th International Workshop on Bibliometric-enhanced Information Retrieval (BIR2017)**, *Aberdeen*, Scotland.  
Co-organiser of the workshop held at ECIR 2017.
- 2016 **3rd International Workshop on Bibliometric-enhanced Information Retrieval (BIR2016)**, *Padua*, Italy.  
Co-organiser of the workshop held at ECIR 2016.
- 2015 **2nd International Workshop on Bibliometric-enhanced Information Retrieval (BIR2015)**, *Vienna*, Austria.  
Co-organiser of the workshop held at ECIR 2015.
- 2014 – 2017 **Information Retrieval and Foraging Autumn School**, Germany.  
Co-organiser of three one week schools on selected information foraging and retrieval topics (2014, 2016 and 2017 at Schloß Dagstuhl, Germany, 2015 at Castle Katlenburg, Germany)
- 2006 **Heterogeneous Track at the Initiative for the Evaluation of XML Retrieval**.  
Co-organiser of the INEX 2006 Heterogeneous Track.

### Editorial Board, Managing Editor and Guest Editor

- since 2009 **Datenbank-Spektrum Journal**.  
Member of the editorial board of Datenbank-Spektrum, the joint journal of the German special interest groups on databases resp. information retrieval.
- since 2001 **International Journal on Digital Libraries (IJDL)**.  
Managing editor and member of the editorial board of IJDL. Main responsibilities include supervising the whole reviewing life cycle of incoming submissions, including editor and reviewer assignments, and editorial activities.
- 2011 **Guest Editor IJDL Focussed Issue on ECDL 2010**.

### Programme Committee and Reviewer

- 2004–Present Member of the programme committee and reviewer at the following conferences and workshops: ACM SIGIR, ACM CIKM, ACM/IEEE JCDL, ACM ICTIR, ACM CHIIR, WWW, ECIR, ECDL/TPDL, IiX, Russian IR Summer School, Quantum Interaction, TIR, KDIR, LWA, LSHC, AIRS, HPCS.

Reviewer for several journals such as ACM Transactions on Information Systems (TOIS), Elsevier Information Systems, Elsevier Information Processing & Management (IP&M), The Journal of the American Society for Information Science and Technology (JASIST), The Information Retrieval Journal (Springer), The Computer Journal, PLOS ONE, Theoretical Computer Science (Elsevier), Scientometrics (Springer) and The International Journal on Digital Libraries (Springer).

## Administrative and Steering Activities

- since 2018 **Information and Data Science Subject Lead**, *University of Bedfordshire*, Luton, UK.  
Coordinating the Information and Data Science teaching activities.
- 2017–2018 **BCS Accreditation**, *University of Bedfordshire*, Luton, UK.  
Coordinated the successful BCS accreditation application of undergraduate and postgraduate computer science programmes taught at the University of Bedfordshire.
- 2016 **VC's Research & Enterprise Sub Group**, *University of Bedfordshire*, Luton, UK.  
Member of the Vice Chancellor's sub group to shape the university's research and enterprise strategy.
- 2013–2014 **Data Science Programme Approval**, *University of Bedfordshire*, Luton, UK.  
Responsible for the design and specification of the successfully approved undergraduate BSc (Hons) Data Science programme at the University of Bedfordshire, including the design and specification of a module on Data Engineering and Retrieval.
- 2013 – 2015 **Staff Representative**, *University of Bedfordshire, Institute for Research in Applicable Computing (IRAC)*, Luton, UK.  
Elected staff representative in the IRAC steering committee.
- 2013–2015 **Deputy Head**, *IRAC Centre for Research in Distributed Technologies (CREDIT)*, *University of Bedfordshire*, Luton, UK.  
I am deputy head of CREDIT and established a Data Science special interest group within CREDIT.
- since 2011 **Steering Committee, The Chartered Institute for IT (BCS) Information Retrieval Specialist Group**.  
Elected member of the steering committee and treasurer of the BCS IRSG.
- since 2008 **Steering Committee, German Computing Society Information Retrieval Special Interest Group**.  
Elected member of the steering committee of the IR Special Interest Group of the German Computing Society (Fachgruppe Information Retrieval der Gesellschaft für Informatik).

---

## Professional Bodies

- since 2014 **BCS Fellow (FBCS)**.
- since 2016 **ACM Member (ACM SIGIR)**.
- since 2012 **Fellow of the Higher Education Academy (FHEA)**.
- since 2016 **Member of the Engineering Professors' Council (EPC)**.

---

## Teaching Experience

### Course/Programme Co-ordinator

- since 2018 **Data and Information Science Subject Group Leader**, *University of Bedfordshire*, Luton, UK.  
Co-ordinator of the BSc Computing Data Science programme at the School of Computer Science and Technology of the University of Bedfordshire.
- since 2014 **BSc (Hons) Computing and Data Science**, *University of Bedfordshire*, Luton, UK.  
Co-ordinator of the BSc Computing Data Science programme at the School of Computer Science and Technology of the University of Bedfordshire.

- since 2016 **BSc (Hons) Information and Data Systems**, *University of Bedfordshire*, Luton, UK.  
Co-ordinator of the BSc Information and Data Systems programme at the School of Computer Science and Technology of the University of Bedfordshire.
- 2011–2014 **BSc (Hons) Information Systems**, *University of Bedfordshire*, Luton, UK.  
Co-ordinator of the BSc Information Systems programme at the School of Computer Science and Technology of the University of Bedfordshire.
- 2011–2014 **BSc (Hons) Business Information Systems**, *University of Bedfordshire*, Luton, UK.  
Co-ordinator of the BSc Business Information Systems programme at the School of Computer Science and Technology of the University of Bedfordshire (held in conjunction with the UoB Business School).

### Module Co-ordinator and Lecturer

- since 2017 **Intelligent systems and Data Mining**, *University of Bedfordshire*, Luton, UK.  
Lecturer; delivering lectures on semantic search, information retrieval and text/web mining; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; postgraduate module.
- since 2013 **Advanced IT Strategies and Paradigms**, *University of Bedfordshire*, Luton, UK.  
Module co-ordinator; delivering lectures on information retrieval, XML and ontologies; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; 3rd year undergraduate module.
- since 2017 **Mathematics of Data**, *University of Bedfordshire*, Luton, UK.  
Lecturer; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; 1st year undergraduate module.
- since 2013 **Principles of Programming**, *University of Bedfordshire*, Luton, UK.  
Module co-ordinator; designing and delivering lectures on Java programming; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; 1st year undergraduate module.
- 2011–2016 **(Advanced) Data Modelling and Management**, *University of Bedfordshire*, Luton, UK.  
Module co-ordinator; designing and delivering lectures on UML, databases and data modelling; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; postgraduate module. Responsible for delivery of lectures at partner college in Oman.
- 2014–2016 **Grid Services and Distributed Networking**, *University of Bedfordshire*, Luton, UK.  
Module co-ordinator; designing and delivering lectures on XML, Web Services, Hadoop, grid computing and cloud computing; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; postgraduate module taught at partner college in Oman.
- 2007 **Information Engineering**, *University of Duisburg-Essen*, Duisburg, Germany.  
Module co-ordinator; design and delivery of lectures and tutorials on methods, concepts and systems supporting the information life cycle (creation, management, dissemination and processing), which comprised authoring systems, metadata, databases, information and process modelling, digital preservation, access management, digital libraries and information seeking and retrieval; postgraduate module.

### Lecturer

- 2011–2016 **Distributed and Parallel Computing**, *University of Bedfordshire*, Luton, UK.  
Designing and delivering lectures on distributed computing, grid computing and cloud computing; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; postgraduate module.
- 2011–2013 **Programming and Modelling**, *University of Bedfordshire*, Luton, UK.  
Designing and delivering lectures on Java programming; responsible for organising laboratory sessions, student assignments and the general assessment of student progress; 1st year undergraduate module.
- 2010/11 **Distributed Information Management / Information Technology**, *University of Glasgow*, Glasgow, UK.  
Delivered and designed lectures on XML; postgraduate and 3rd year undergraduate module.



- 2010/11 **General Readings in Computer Science**, *University of Glasgow*, Glasgow, UK.  
Marking students' presentations; postgraduate module.
- 2006–2008 **Modelling Methods in Computer Science**, *University of Duisburg-Essen*, Duisburg, Germany.  
Delivered and designed tutorials and occasional lectures; exam marking; undergraduate module.
- 2008 **Information Retrieval**, *University of Duisburg-Essen*, Duisburg, Germany.  
Delivered and designed tutorials and lectures; postgraduate module.
- 2008 **Information Mining**, *University of Duisburg-Essen*.  
Delivered and designed tutorials and lectures; postgraduate module.

### Seminar and Student Project Organiser

- 2010 **Geometry and Information Retrieval**, *Fern-Universität Hagen*, Hagen, Germany.  
Postgraduate seminar on geometric and quantum-based information retrieval.
- 2008 **Social Information Retrieval**, *University of Duisburg-Essen*, Duisburg, Germany.  
Postgraduate seminar on social information retrieval and Web 2.0.
- 2005 **Researcher's Workbench: Managing, annotating and retrieving documents**, *University of Duisburg-Essen*, Duisburg, Germany.  
In this postgraduate project students had to design and implement a tool for managing, annotating and retrieving documents.
- 2002–2004 **The Semantic Web: Intelligent search for structured data collections**, *Darmstadt University of Technology*, Darmstadt, Germany.  
Postgraduate seminar on Semantic Web concepts and technologies.
- 2004 **XML Retrieval**, *University of Duisburg-Essen*, Duisburg, Germany.  
Postgraduate seminar on XML information retrieval.

### Thesis Supervision and Mentoring

- 2011 – 2015 **A Probabilistic Approach for Cluster Based Interactive Information Retrieval**, *University of Bedfordshire*, UK.  
Director of studies of the successful PhD thesis of Dr Kamran Abbasi.
- 2013–2017 **A Methodology for Contextual Recommendation using Artificial Neural Networks**, *University of Bedfordshire*, UK.  
Director of studies of the successful PhD thesis of Dr Mustafa Ghulam.
- 2011 – 2015 **A Framework for Evaluating e-Government Success**, *University of Bedfordshire*, UK.  
2nd supervisor of the successful PhD thesis of Dr Obaid Almalki.
- since 2012 **A Conceptual Framework to Support Cross-cultural User Experience Design for Information Retrieval (working title)**, *University of Bedfordshire*, UK.  
Director of Studies of the PhD thesis of MSc Karen Chessum.
- since 2012 **A Novel Linked Data Powered Recommendation System for the Cultural Heritage Domain (working title)**, *University of Bedfordshire*, UK.  
Director of studies of the PhD thesis of MSc Nick Collis.
- since 2014 **A Hybrid Framework to Detect and Filter Cyberstalking Emails**, *University of Bedfordshire*, UK.  
Director of studies of the thesis of MSc Zinnar Ghasem.
- since 2015 **Real-time Twitter event detection (working title)**, *University of Bedfordshire*, UK.  
2nd supervisor of the PhD thesis of MSc Waleed Alabbas.
- since 2014 **Information Retrieval in Bioinformatics (working title)**, *University of Bedfordshire*, UK.  
2nd supervisor of the PhD thesis of MSc Faris Abomelha.
- 2017–2018 **Developing and Evaluating a Cost-effective Solution for Augmented Reality Conversational Agents for Museums**, *University of Bedfordshire*, UK.  
Director of studies of the MSc by Research thesis of BSc (Hons) Sebastian Grygiel.

- 2011-2012 **Balancing Exploration and Exploitation in Learning to Rank Online**, *University of Amsterdam*, The Netherlands.  
In the context of the ECIR 2011 student mentoring program I was appointed the mentor of Dr Katja Hofmann's successful PhD thesis.
- 2010-2011 **Cognitive IR models for patent search**, *University of Glasgow*, Glasgow, UK.  
I have been assisting in supervising the successful PhD of Dr. Erik Graf about human information processing and information retrieval (supervisor: M. Lalmas).
- since 2011 **MSc and BSc project supervision**, *University of Bedfordshire*, Luton, UK.  
I have been supervising several MSc and BSc projects on information retrieval and high-throughput computing, personal digital assistants, business information systems, distributed systems and computer networks.
- 2008-2009 **Email-based Expert Search for Helpdesks**, *University of Duisburg-Essen*, Duisburg, Germany.  
Diploma (master) thesis of Dipl.-Inform. Evgenia Nikiforova
- 2008-2009 **Annotations in Daffodil**, *University of Duisburg-Essen*, Duisburg, Germany.  
Bachelor thesis of BSc Simeon Gerenski.
- 2008 **Multifacet-Classification of Emails in a Helpdesk Scenario**, *University of Duisburg-Essen*, Duisburg, Germany.  
Diploma (master) thesis of Dipl.-Inform. Thomas Beckers
- 2007 **Sentiment Classification in Discussions**, *University of Duisburg-Essen*, Duisburg, Germany.  
Diploma (master) thesis of Dipl.-Inform. Marc Lechtenfeld, now PhD student at the University of Duisburg-Essen.
- 2004 **A dynamic, context-based Retrieval Web Service**, *Darmstadt University of Technology*, Darmstadt, Germany.  
Diploma (master) thesis of Dipl.-Inform. Thomas Fritz.
- 2002 **Context-based Retrieval with Discourse Structure Relations**, *Darmstadt University of Technology*, Darmstadt, Germany.  
Diploma (master) thesis of Dipl.-Inform. Gaby Lang.

### PhD and MSc by Research Examiner/Reviewer

- 2016 **Internal examiner Ph.D Thesis "Using Social Media for Supporting Decision-Making in Managing Public Relations: The Case of Abu Dhabi Police"** by Mansour Alkhyeli, *University of Bedfordshire*, Luton, UK.
- 2015 **External examiner Ph.D Thesis "Co-occurrence Rate Networks – An alternative theory for undirected graphical models"** by Zhemin Zhu, *University of Twente*, Enschede, The Netherlands.
- 2015 **External reviewer Ph.D Thesis "Semantic Models for Question Answering"** by Piero Molino, *Dipartimento di Informatica, Università Degli Studi Di Bari Aldo Moro*, Bari, Italy.
- 2018 **External examiner MRes "User Engagement with Generous Interfaces for Digital Cultural Heritage"** by Rob Speakman, *Edge Hill University*, Omskirk, UK.

### Technical Skills

Platforms	Mac OS X, Linux, Solaris, Windows, MS-DOS, AIX, AmigaOS	Programming Languages	Java, Perl, PHP, Python, R, C, Unix Shell (Bash, sh), Prolog, SQL, PL/SQL, Scheme, Modula 2, Assembler (M6510 (C64), MC68000 (Amiga)), Basic
Databases	MySQL, Oracle, Informix	Markup	HTML, XML, XML schema, RDF(S), OWL



Information Retrieval MG4J, HySpirit, probabilistic Datalog, Solr/Lucene, Terrier, FAST

Tools Hadoop, J2EE, Eclipse, Jetty, Apache Tomcat, Apache Web server, Oracle Forms, Cyrus IMAP server, L<sup>A</sup>T<sub>E</sub>X, CVS, SVN, GIT, Maven, Protégé, Microsoft Office, Open Office, Inkscape

---

## Own Software Projects

- POLAR** Prototype of an object-oriented logic-based probabilistic framework for annotation-based document retrieval and discussion search, based on probabilistic Datalog.
- JaySpirit** Java API for the HySpirit retrieval framework (which is written in Perl and C). Available at <https://github.com/ifromm/jayspirit>.
- Executive Search** Java implementation (Web service, middleware) of a search engine for executives, combining database and retrieval technology.
- Daffodil** I was responsible for the annotation services in the Daffodil system.
- COLLATE** I designed and implemented the search and retrieval module in the COLLATE prototype.
- Further Projects** During my time as a software developer I was responsible for the design and implementation of several software modules in different projects. In my consultancy projects I develop advanced search services.

---

## Languages

- German **native**
- English **fluent**

---

## Publications

### Refereed Publications

Amit Kumar Jaiswal, Guilherme Holdack, Ingo Frommholz, and Haiming Liu. Quantum-like Generalization of Complex Word Embedding: a lightweight approach for textual classification. In *Proceedings Lernen Wissen Daten Analysen (LWDA 2018)*, 2018.

Waleed Alabbas, Haider Al-Khateeb, Ali Mansour, Gregory Epiphaniou, and Ingo Frommholz. Classification of Colloquial Arabic Tweets in real-time to detect high-risk floods. In *Proceedings International Conference on Social Media, Wearable and Web Analytics (Social Media 2017)*. IEEE, 2017.

Nick Collis and Ingo Frommholz. Aquacold – a crowdsourced query understanding and query construction tool for the linked data web. In Philipp Mayr, Douglas Tudhope, Koraljka Golub, Christian Wartena, and Ernesto William De Luca, editors, *Proc. of the 17th European Networked Knowledge Organization Systems Workshop (NKOS 2017) at TPD 2017*, pages 74–86, Thessaloniki, Greece, 2017. CEUR-WS.org.

Ingo Frommholz, Haider Al-Khateeb, Martin Potthast, Zinnar Ghasem, Mitul Shukla, and Emma Short. On textual analysis and machine learning for cyberstalking detection. *Datenbank-Spektrum*, 16(2):127–135, 2016.

Ingo Frommholz and Thomas Roelleke. Scalable DB+IR technology: Processing probabilistic datalog with HySpirit. *Datenbank-Spektrum*, 16(1):39–48, 2016.

Ghulam Mustafa and Ingo Frommholz. Comparing contextual and non-contextual features in ANNs for movie rating prediction. In Ralf Krestel, Davide Mottin, and Emmanuel Müller, editors, *Proceedings of the Conference "Lernen, Wissen, Daten, Analysen", Workshop Information Retrieval*, Potsdam, Germany, 2016. CEUR-WS.org.

Muhammad Kamran Abbasi and Ingo Frommholz. Cluster-based polyrepresentation as science modelling approach for information retrieval. *Scientometrics*, 102(3):2301–2322, 2015.

Muhammad Kamran Abbasi and Ingo Frommholz. Polyrepresentative clustering: A study of simulated user strategies and representations. In Philipp Mayr, Ingo Frommholz, and Peter Mutschke, editors, *Proc. of the 2nd Workshop on Bibliometric-enhanced Information Retrieval (BIR2015)*, pages 47–54, Vienna, Austria, 2015. CEUR-WS.org.

- Zinnar Ghasem, Ingo Frommholz, and Carsten Maple. A Machine Learning Framework to Detect And Document Text-based Cyberstalking. In Claus-Peter Klas and Ingo Frommholz, editors, *Proceedings Information Retrieval Workshop at Lernen-Wissen-Adaptivität (LWA 2015)*, number October, pages 348–355, Trier, Germany, 2015. CEUR-WS.org.
- Zinnar Ghasem, Ingo Frommholz, and Carsten Maple. A hybrid approach to combat email-based cyberstalking. In *The Fourth International Conference on Future Generation Communication Technologies (FGCT 2015)*, pages 106–111, Luton, UK, 2015. IEEE.
- Zinnar Ghasem, Ingo Frommholz, and Carsten Maple. Machine learning solutions for controlling cyberbullying and cyberstalking. *Journal of Information Security Research*, 6(2):55–64, 2015.
- Zinnar Ghasem, Ingo Frommholz, and Carsten Maple. A new approach for selecting informative features for text classification. In Claus-Peter Klas and Ingo Frommholz, editors, *Proceedings Information Retrieval Workshop at Lernen-Wissen-Adaptivität (LWA 2015)*, number October, pages 382–389, Trier, Germany, 2015. CEUR-WS.org.
- Ghulam Mustafa and Ingo Frommholz. Performance comparison of Top N recommendation algorithms. In *The Fourth International Conference on Future Generation Communication Technologies (FGCT 2015)*, pages 100–105, Luton, UK, 2015. IEEE.
- Muhammad Kamran Abbasi and Ingo Frommholz. Exploiting information needs and bibliographics for polyrepresentative document clustering. In *Proceedings of the Bibliometrics-enhanced Information Retrieval Workshop at ECIR 2014*, pages 21–28, 2014.
- Karen Chessum, Haiming Liu, and Ingo Frommholz. Applying cross-cultural theory to understand users’ preferences on interactive information retrieval platform design. In *Proceedings euroHCIR 2014*, 2014.
- Ingo Frommholz and Muhammad Kamran Abbasi. On clustering and polyrepresentation. In *Proceedings of the European Conference on Information Retrieval (ECIR 2014)*, pages 618–623, 2014.
- Ingo Frommholz, David Graves, Haiming Liu, Ashwin Kumar, and Gordon Brady. Great War stories told by the people – crowdsourced cultural heritage in digital museums. In *Proceedings Digital Libraries 2014 (ACM/IEEE Joint Conference on Digital Libraries (JCDL 2014) and International Conference on Theory and Practice of Digital Libraries (TPDL 2014))*, pages 419–420, 2014.
- Obaid Almalki, Yanqing Duan, Ingo Frommholz, and Markus Haag. Identifying the Relevance of Personal Values to e-Government Portals’ Success: Insights from a Delphi Study. In *Proc. of the International Conference on Information and Social Science (ISS 2013)*, pages 97–112, 2013.
- Birger Larsen, Christina Lioma, Ingo Frommholz, and Hinrich Schütze. Preliminary study of technical terminology for the retrieval of scientific book metadata records categories and subject descriptors. In *SIGIR 2012: Proceedings of the 35th Annual International ACM SIGIR Conference on Research and Development in Information Retrieval*, pages 1131–1132, August 2012.
- Obaid Almalki, Janqing Duan, and Ingo Frommholz. An exploratory study on e-government systems success in Saudi Arabia. In *Proceedings of the 12th European Conference on eGovernment (ECEG 2012)*, pages 38–46, July 2012.
- Ingo Frommholz, Benjamin Piwowski, Mounia Lalmas, and Keith van Rijsbergen. Processing queries in session in a quantum-inspired IR framework. In *Proceedings of the 33rd European Conference on IR Research (ECIR 2011)*, pages 751–754. Springer, 2011. **Nominated for best poster award.**
- Fabrizio Smeraldi, Miguel Martinez-Alvarez, Ingo Frommholz, and Thomas Roelleke. Logical modelling of quantum- and geometrically-inspired IR. In *Proceedings of the 2nd Italian Information Retrieval (IIR) Workshop*, 2011.
- David Zellhöfer, Ingo Frommholz, Ingo Schmitt, Mounia Lalmas, and Keith van Rijsbergen. Towards quantum-based DB+IR processing based on the principle of polyrepresentation. In *Proceedings of the 33rd European Conference on IR Research (ECIR 2011)*, pages 729–732. Springer, 2011. **Nominated for best poster award.**
- Benjamin Piwowski, Ingo Frommholz, Mounia Lalmas, and Keith Van Rijsbergen. What can quantum theory bring to information retrieval? In *Proc. 19th International Conference on Information and Knowledge Management (CIKM 2010)*, pages 59–68, October 2010.
- Dawei Song, Mounia Lalmas, Keith van Rijsbergen, Ingo Frommholz, Benjamin Piwowski, Jun Wang, P Zhang, Guido Zuccon, Peter Bruza, Sachi Arafat, Leif Azzopardi, Alvaro

- Huertas-Rosero, Y Hou, Massimo Melucci, and Stefan R uger. How quantum theory is developing the field of information retrieval. In *Proceedings Quantum Interaction 2010*, October 2010.
- Ingo Frommholz, Birger Larsen, Benjamin Piwowarski, Mounia Lalmas, Peter Ingwersen, and Keith van Rijsbergen. Supporting polyrepresentation in a quantum-inspired geometrical retrieval framework. In *Proceedings of the 2010 Information Interaction in Context Symposium*, pages 115–124, New Brunswick, August 2010. ACM. **Shortlisted for best paper award.**
- Benjamin Piwowarski, Ingo Frommholz, Mounia Lalmas, and Keith van Rijsbergen. Exploring a multidimensional representation of documents and queries. In *Proceedings of the 9th RIAO Conference (RIAO 2010)*, Paris, France, June 2010.
- Benjamin Piwowarski, Ingo Frommholz, Yashar Moshfeghi, Mounia Lalmas, and Keith van Rijsbergen. Filtering documents with subspaces. In *Proceedings of the 32nd European Conference on Information Retrieval (ECIR 2010)*, pages 615–618, January 2010. **Best poster award!**
- Erik Graf, Ingo Frommholz, Mounia Lalmas, and Keith van Rijsbergen. Knowledge modeling in prior art search. In Hamish Cunningham, Allan Hanbury, and Stefan R uger, editors, *Proceedings of the First Information Retrieval Facility Conference, IRFC 2010*, volume 6107 of *Lecture Notes in Computer Science*, pages 31–46, Berlin, Heidelberg, 2010. Springer Berlin Heidelberg.
- Thomas Beckers, Ingo Frommholz, and Ralf B onning. Multi-facet classification of e-mails in a helpdesk scenario. In Thomas Mandl and Ingo Frommholz, editors, *Proc. of the GI Information Retrieval Workshop at LWA 2009*, 2009.
- Ingo Frommholz and Keith Van Rijsbergen. Towards a geometrical model for polyrepresentation of information objects. In Thomas Mandl and Ingo Frommholz, editors, *Proc. of the GI Information Retrieval Workshop at LWA 2009*, 2009.
- Ingo Frommholz and Marc Lechtenfeld. Determining the polarity of postings for discussion search. In *Proc. of the “Information Retrieval 2008” Workshop at LWA 2008, W urzburg, Germany*, October 2008.
- Norbert Fuhr, Matthias Jordan, and Ingo Frommholz. Combining cognitive and system-oriented approaches for designing IR user interfaces. In *Proceedings of the 2nd International Workshop on Adaptive Information Retrieval (AIR 2008)*, October 2008.
- Ingo Frommholz. Annotation-based document retrieval with probabilistic logics. In Norbert Fuhr, Laszlo Kovacs, and Carlo Meghini, editors, *Research and Advanced Technology for Digital Libraries. Proc. of the 11th European Conference on Digital Libraries (ECDL 2007)*, Lecture Notes in Computer Science, pages 321–332, Heidelberg et al., September 2007. Springer.
- Ingo Frommholz and Norbert Fuhr. Evaluation of relevance and knowledge augmentation in discussion search. In Julio Gonzalo, Costantino Thanos, M Felisa Verdejo, and Rafael C Carrasco, editors, *Research and Advanced Technology for Digital Libraries. Proc. of the 10th European Conference on Digital Libraries (ECDL 2006)*, Lecture Notes in Computer Science, pages 279–290, Heidelberg et al., September 2006. Springer.
- Maristella Agosti, Nicola Ferro, Ingo Frommholz, Emanuele Panizzi, Wolfgang Putz, and Ulrich Thiel. Integration of the DiLAS annotation service into digital library infrastructures. In Ann Blandford and Jeremy Gow, editors, *Proc. Digital Libraries in the Context of Users’ Broader Activities Workshop (CUBA) at JCDL 2006*, June 2006.
- Ingo Frommholz and Norbert Fuhr. Probabilistic, object-oriented logics for annotation-based retrieval in digital libraries. In Michael Nelson, Cathy Marshall, and Gary Marchionini, editors, *Proc. of the 6th ACM/IEEE Joint Conference on Digital Libraries (JCDL 2006)*, pages 55–64, New York, 2006. ACM.
- Ingo Frommholz. What did the others say? Probabilistic indexing and retrieval models in annotation-based discussions. *TCDL Bulletin*, 2(2), 2006.
- Maristella Agosti, Hanne Albrechtsen, Nicola Ferro, Ingo Frommholz, Preben Hansen, Nicola Orio, Emanuele Panizzi, Annelise Mark Pejtersen, and Ulrich Thiel. DiLAS: a digital library annotation service. In *Proceedings of Annotation for Collaboration – A Workshop on Annotation Models, Tools and Practices*, 2005.
- Ingo Frommholz, Predrag Kne evi c, Bhaskar Mehta, Claudia Niedere e, Thomas Risse, and Ulrich Thiel. Supporting information access in next generation digital library architectures. In Maristella Agosti, Hans-J org Schek, and Can T urker, editors, *Digital Library Architectures: Peer-to-Peer, Grid, and Service-Orientation. Proceedings of the Sixth Thematic Workshop of the EU Network of Excellence DELOS*, pages 49–60, Cagliari, Italy, June 2004.

Maristella Agosti, Nicola Ferro, Ingo Frommholz, and Ulrich Thiel. Annotations in digital libraries and laboratories – facets, models and usage. In Rachel Heery and Liz Lyon, editors, *Research and Advanced Technology for Digital Libraries. Proc. European Conference on Digital Libraries (ECDL 2004)*, Lecture Notes in Computer Science, pages 244–255, Heidelberg et al., 2004. Springer.

Ingo Frommholz, Ulrich Thiel, and Thomas Kamps. Annotation-based document retrieval with four-valued probabilistic datalog. In Thomas Rölleke and Arjen P de Vries, editors, *Proceedings of the first SIGIR Workshop on the Integration of Information Retrieval and Databases (WIRD'04)*, pages 31–38, Sheffield, UK, 2004.

Marcello L'Abbate, Ingo Frommholz, Ulrich Thiel, and Erich Neuhold. Using case based retrieval techniques for handling anomalous situations in advisory dialogues. In Fernando Galindo, Makoto Takizawa, and Roland Traummüller, editors, *Proceedings of the 15th International Conference on Database and Expert Systems Application (DEXA 2004)*, pages 539–548, 2004.

Erich Neuhold, Claudia Nedereé, Avaré Stewart, Ingo Frommholz, and Bhaskar Mehta. The role of context for information mediation in digital libraries. In *Proc. of the 7th International Conference on Asian Digital Libraries: International Collaboration and Cross-Fertilization (ICADL 2004)*, pages 133–143, 2004.

Ulrich Thiel, Holger Brocks, Ingo Frommholz, Andrea Dirsch-Weigand, Jürgen Keiper, Adelheit Stein, and Erich Neuhold. COLLATE - a collaborative supporting research on historic european films. *International Journal on Digital Libraries (IJDL)*, 4(1):8–12, 2004.

Ingo Frommholz, Holger Brocks, Ulrich Thiel, Erich Neuhold, Luigi Iannone, Giovanni Semeraro, Magarita Berardi, and Michaele Ceci. Document-centered collaboration for scholars in the humanities - the COLLATE system. In Panos Constantopoulos and Ingeborg T Solvberg, editors, *Research and Advanced Technology for Digital Libraries. Proc. European Conference on Digital Libraries (ECDL 2003)*, Lecture Notes in Computer Science, pages 434–445, Heidelberg et al., 2003. Springer.

Ingo Frommholz, Holger Brocks, Ulrich Thiel, and Adelheit Stein. Kontextbasiertes Retrieval unter Verwendung verknüpfter Annotationen. In *32. GI-Jahrestagung, Informatik 2002*, pages 161–165, Heidelberg et al., October 2002. Springer.

Holger Brocks, Adelheit Stein, Ulrich Thiel, Ingo Frommholz, and Andrea Dirsch-Weigand. How to incorporate collaborative discourse in cultural digital libraries. In *Proceedings of the ECAI 2002 Workshop on Semantic Authoring, Annotation & Knowledge Markup (SAAKM02)*, Lyon, France, July 2002.

Ingo Frommholz. Categorizing web documents in hierarchical catalogues. In *23th European Conference on Information Retrieval Research (ECIR 2001)*, March 2001.

## Books and Book Sections

Guillaume Cabanac, Muthu Kumar Chandrasekaran, Ingo Frommholz, Kokil Jaidka, Min-Yen Kan, Philipp Mayr, and Dietmar Wolfram, editors. *Proceedings of the Joint Workshop on Bibliometric-enhanced Information Retrieval and Natural Language Processing for Digital Libraries (BIRNDL) co-located with the Joint Conference on Digital Libraries 2016 (JCDL 2016)*. CEUR-WS.org, Newark, NJ, USA, 2016.

Philipp Mayr, Ingo Frommholz, and Guillaume Cabanac, editors. *Proceedings of the Third Workshop on Bibliometric-enhanced Information Retrieval co-located with the 38th European Conference on Information Retrieval (ECIR 2016)*, Padua, Italy, 2016. CEUR-WS.org.

Philipp Mayr, Ingo Frommholz, and Peter Mutschke, editors. *Proceedings of the Second Workshop on Bibliometric-enhanced Information Retrieval co-located with the 37th European Conference on Information Retrieval (ECIR 2015)*. CEUR-WS.org, 2015.

Ingo Frommholz, Muhammad Kamran Abbasi, Dunja Mladenčić, Marko Grobelnik, and Fredrik Aström. Automated Tools for Subject Information Organization: Selected Topics. In Koraljka Golub, editor, *Subject Information Access - an Interdisciplinary Approach*, chapter 4, pages 107–148. Libraries Unlimited, 2014.

Dawei Song, Massimo Melucci, Ingo Frommholz, Peng Zhang, Lei Wang, and Sachi Arafat, editors. *Proceedings of the Fifth International Quantum Interaction Symposium (QI 2011)*, Aberdeen, UK. Springer, LNCS edition, July 2011.

Mounia Lalmas, Joemon Jose, Andreas Rauber, Fabrizio Sebastiani, and Ingo Frommholz, editors. *Research and Advanced Technology for Digital Libraries 14th European Conference, ECDL 2010, Glasgow, UK, September 6-10, 2010. Proceedings*. Springer, LNCS edition, September 2010.

Ingo Frommholz, Keith van Rijsbergen, Fabio Crestani, and Mounia Lalmas. Towards a geometrical cognitive framework. In Birger Larsen, Jesper Schneider, Fredrik Aström, and Balázs Schlemmer, editors, *The Janus Faced Scholar. A Festschrift in Honour of Peter Ingwersen*, pages 43–48. July 2010.

Ulrich Thiel, Holger Brocks, Andrea Dirsch-Weigand, André Everts, Ingo Frommholz, and Adelheit Stein. Queries in context: Access to digitized historic documents in a laboratory for the humanities. In Matthias Hemmje, Claudia Niedereé, and Thomas Risse, editors, *From Integrated Publication and Information Systems to Virtual Information and Knowledge Environments. Essays Dedicated to Erich J. Neuhold on the Occasion of His 65th Birthday*, pages 117–127. Springer, 2005.

## Unrefereed Publications and Studies

Philipp Mayr, Ingo Frommholz, and Guillaume Cabanac. Editorial for the 3rd bibliometric-enhanced information retrieval workshop at ECIR 2016. In *Proceedings BIR 2016 Workshop on Bibliometric-enhanced Information Retrieval*, pages 1–4. CEUR-WS.org, 2016.

Philipp Mayr, Ingo Frommholz, and Peter Mutschke. Editorial for the bibliometric-enhanced information retrieval workshop at ECIR 2015. In *Proceedings of the Second Workshop on Bibliometric-enhanced Information Retrieval (BIR 2015)*, pages 1–4, Vienna, Austria, 2015. CEUR-WS.org.

Ingo Frommholz, Andreas Rauber, and Fabrizio Sebastiani. Guest Editors' introduction to the focussed issue on the 14th European Conference on Digital Libraries (ECDL 2010). *International Journal on Digital Libraries*, 2(12), 2011.

Benjamin Piwowarski, Ingo Frommholz, Mounia Lalmas, and Keith Van Rijsbergen. Exploring a multidimensional representation of documents and queries (extended version), 2010. Extended version of our RIAO 2010 paper. Available at <http://arxiv.org/pdf/1002.3238v2.pdf>.

Ingo Frommholz and Ray R Larson. Report on the INEX 2006 heterogeneous collection track. In *SIGIR Forum*, volume 41, June 2007.

Ingo Frommholz and Ray R Larson. The heterogeneous collection track at INEX 2006. LNCS, pages 312–317, Heidelberg et al., 2007. Springer.

Ingo Frommholz and Norbert Fuhr. KI-Methoden zur Email-Archivierung – Technologische Studie zum “Inbox-Szenario”, November 2006. Study examining the application of machine learning and AI methods for archiving emails, on behalf of d.velop AG, Germany. Available at [http://www.is.informatik.uni-duisburg.de/bib/pdf/ir/Frommholz\\_Fuhr:06b.pdf](http://www.is.informatik.uni-duisburg.de/bib/pdf/ir/Frommholz_Fuhr:06b.pdf). In German.

Ingo Frommholz. Applying the annotation view on messages for discussion search. In E M Voorhees and Lori P Buckland, editors, *The Fourteenth Text REtrieval Conference (TREC 2005)*, Gaithersburg, MD, USA, 2005. NIST.

Ingo Frommholz and Matthias Hemmje. Ausarbeitung von Lösungsansätzen für die Erstellung eines Thesaurus-basierten Geologischen Informationssystems des Bayerischen Geologischen Landesamts München – Technologische Studie, December 2001. Study examining means for migrating a geological database into a European information system/thesaurus, on behalf of the Bavarian Environment Agency in Munich, Germany. In German.

## Theses

Ingo Frommholz. *A Probabilistic Framework for Information Modelling and Retrieval Based on User Annotations on Digital Objects*. Phd thesis, University of Duisburg-Essen, 2008. Available at [http://www.is.inf.uni-due.de/bib/docs/Frommholz\\_08.html.en](http://www.is.inf.uni-due.de/bib/docs/Frommholz_08.html.en).

Ingo Frommholz. Automatische Kategorisierung von Web-Dokumenten. Diploma thesis, University of Dortmund, January 2001.