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Visual Information Retrieval using Java and LIRE

Mathias Lux
Oge Marques

*SYNTHESIS LECTURES ON INFORMATION
CONCEPTS, RETRIEVAL, AND SERVICES*

Gary Marchionini, Series Editor

Visual Information Retrieval Using Java And Lire Oge Marques

Thomas Roelleke



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Visual Information Retrieval Using Java and LIRE Mathias Lux,Oge Marques,2022-05-31 Visual information retrieval VIR is an active and vibrant research area which attempts at providing means for organizing indexing annotating and retrieving visual information images and videos from large unstructured repositories The goal of VIR is to retrieve matches ranked by their relevance to a given query which is often expressed as an example image and or a series of keywords During its early years 1995 2000 the research efforts were dominated by content based approaches contributed primarily by the image and video processing community During the past decade it was widely recognized that the challenges imposed by the lack of coincidence between an image s visual contents and its semantic interpretation also known as semantic gap required a clever use of textual metadata in addition to information extracted from the image s pixel contents to make image and video retrieval solutions efficient and effective The need to bridge or at least narrow the semantic gap has been one of the driving forces behind current VIR research Additionally other related research problems and market opportunities have started to emerge offering a broad range of exciting problems for computer scientists and engineers to work on In this introductory book we focus on a subset of VIR problems where the media consists of images and the indexing and retrieval methods are based on the pixel contents of those images an approach known as content based image retrieval CBIR We present an implementation oriented overview of CBIR concepts techniques algorithms and figures of merit Most chapters are supported by examples written in Java using Lucene an open source Java based indexing and search implementation and LIRE Lucene Image REtrieval an open source Java based library for CBIR Table of Contents Introduction Information Retrieval Selected Concepts and Techniques Visual Features Indexing Visual Features LIRE An Extensible Java CBIR Library Concluding Remarks

Visual Information Retrieval using Java and LIRE Mathias Lux,Oge Marques,2013-01-01 Visual information retrieval VIR is an active and vibrant research area which attempts at providing means for organizing indexing annotating and retrieving visual information images and videos from large unstructured repositories The goal of VIR is to retrieve matches ranked by their relevance to a given query which is often expressed as an example image and or a series of keywords During its early years 1995 2000 the research efforts were dominated by content based approaches contributed primarily by the image and video processing community During the past decade it was widely recognized that the challenges imposed by the lack of coincidence between an image s visual contents and its semantic interpretation also known as semantic gap required a clever use of textual metadata in addition to information extracted from the image s pixel contents to make image and video retrieval solutions efficient and effective The need to bridge or at least narrow the semantic gap has been one of the driving forces behind current VIR research Additionally other related research problems and market opportunities have started to emerge offering a broad range of exciting problems for computer scientists and engineers to work on In this introductory book we focus on a subset of VIR problems where the media consists of images and the indexing

and retrieval methods are based on the pixel contents of those images an approach known as content based image retrieval CBIR We present an implementation oriented overview of CBIR concepts techniques algorithms and figures of merit Most chapters are supported by examples written in Java using Lucene an open source Java based indexing and search implementation and LIRE Lucene Image REtrieval an open source Java based library for CBIR Table of Contents Introduction Information Retrieval Selected Concepts and Techniques Visual Features Indexing Visual Features LIRE An Extensible Java CBIR Library Concluding Remarks

Information Retrieval Models Thomas Roelleke, 2022-05-31 Information Retrieval IR models are a core component of IR research and IR systems The past decade brought a consolidation of the family of IR models which by 2000 consisted of relatively isolated views on TF IDF Term Frequency times Inverse Document Frequency as the weighting scheme in the vector space model VSM the probabilistic relevance framework PRF the binary independence retrieval BIR model BM25 Best Match Version 25 the main instantiation of the PRF BIR and language modelling LM Also the early 2000s saw the arrival of divergence from randomness DFR Regarding intuition and simplicity though LM is clear from a probabilistic point of view several people stated It is easy to understand TF IDF and BM25 For LM however we understand the math but we do not fully understand why it works This book takes a horizontal approach gathering the foundations of TF IDF PRF BIR Poisson BM25 LM probabilistic inference networks PIN s and divergence based models The aim is to create a consolidated and balanced view on the main models A particular focus of this book is on the relationships between models This includes an overview over the main frameworks PRF logical IR VSM generalized VSM and a pairing of TF IDF with other models It becomes evident that TF IDF and LM measure the same namely the dependence overlap between document and query The Poisson probability helps to establish probabilistic non heuristic roots for TF IDF and the Poisson parameter average term frequency is a binding link between several retrieval models and model parameters Table of Contents List of Figures Preface Acknowledgments Introduction Foundations of IR Models Relationships Between IR Models Summary Research Outlook Bibliography Author s Biography Index

Fuzzy Information Retrieval Donald H. Kraft, Erin Colvin, 2022-06-01 Information retrieval used to mean looking through thousands of strings of texts to find words or symbols that matched a user s query Today there are many models that help index and search more effectively so retrieval takes a lot less time Information retrieval IR is often seen as a subfield of computer science and shares some modeling applications storage applications and techniques as do other disciplines like artificial intelligence database management and parallel computing This book introduces the topic of IR and how it differs from other computer science disciplines A discussion of the history of modern IR is briefly presented and the notation of IR as used in this book is defined The complex notation of relevance is discussed Some applications of IR is noted as well since IR has many practical uses today Using information retrieval with fuzzy logic to search for software terms can help find software components and ultimately help increase the reuse of software This is just one practical application of IR that is covered in this book Some of the classical models of IR is

presented as a contrast to extending the Boolean model This includes a brief mention of the source of weights for the various models In a typical retrieval environment answers are either yes or no i e on or off On the other hand fuzzy logic can bring in a degree of match vs a crisp i e strict match This too is looked at and explored in much detail showing how it can be applied to information retrieval Fuzzy logic is often times considered a soft computing application and this book explores how IR with fuzzy logic and its membership functions as weights can help indexing querying and matching Since fuzzy set theory and logic is explored in IR systems the explanation of where the fuzz is ensues The concept of relevance feedback including pseudorelevance feedback is explored for the various models of IR For the extended Boolean model the use of genetic algorithms for relevance feedback is delved into The concept of query expansion is explored using rough set theory Various term relationships is modeled and presented and the model extended for fuzzy retrieval An example using the UMLS terms is also presented The model is also extended for term relationships beyond synonyms Finally this book looks at clustering both crisp and fuzzy to see how that can improve retrieval performance An example is presented to illustrate the concepts

Predicting Information Retrieval Performance Robert M. Losee, 2022-05-31 Information Retrieval performance measures are usually retrospective in nature representing the effectiveness of an experimental process However in the sciences phenomena may be predicted given parameter values of the system After developing a measure that can be applied retrospectively or can be predicted performance of a system using a single term can be predicted given several different types of probabilistic distributions Information Retrieval performance can be predicted with multiple terms where statistical dependence between terms exists and is understood These predictive models may be applied to realistic problems and then the results may be used to validate the accuracy of the methods used The application of metadata or index labels can be used to determine whether or not these features should be used in particular cases Linguistic information such as part of speech tag information can increase the discrimination value of existing terminology and can be studied predictively This work provides methods for measuring performance that may be used predictively Means of predicting these performance measures are provided both for the simple case of a single term in the query and for multiple terms Methods of applying these formulae are also suggested

Dynamic Information Retrieval Modeling Grace Hui Yang, Marc Sloan, Jun Wang, 2022-05-31 Big data and human computer information retrieval HCIR are changing IR They capture the dynamic changes in the data and dynamic interactions of users with IR systems A dynamic system is one which changes or adapts over time or a sequence of events Many modern IR systems and data exhibit these characteristics which are largely ignored by conventional techniques What is missing is an ability for the model to change over time and be responsive to stimulus Documents relevance users and tasks all exhibit dynamic behavior that is captured in data sets typically collected over long time spans and models need to respond to these changes Additionally the size of modern datasets enforces limits on the amount of learning a system can achieve Further to this advances in IR interface personalization and ad display demand

models that can react to users in real time and in an intelligent contextual way In this book we provide a comprehensive and up to date introduction to Dynamic Information Retrieval Modeling the statistical modeling of IR systems that can adapt to change We define dynamics what it means within the context of IR and highlight examples of problems where dynamics play an important role We cover techniques ranging from classic relevance feedback to the latest applications of partially observable Markov decision processes POMDPs and a handful of useful algorithms and tools for solving IR problems incorporating dynamics The theoretical component is based around the Markov Decision Process MDP a mathematical framework taken from the field of Artificial Intelligence AI that enables us to construct models that change according to sequential inputs We define the framework and the algorithms commonly used to optimize over it and generalize it to the case where the inputs aren't reliable We explore the topic of reinforcement learning more broadly and introduce another tool known as a Multi Armed Bandit which is useful for cases where exploring model parameters is beneficial Following this we introduce theories and algorithms which can be used to incorporate dynamics into an IR model before presenting an array of state of the art research that already does such as in the areas of session search and online advertising Change is at the heart of modern Information Retrieval systems and this book will help equip the reader with the tools and knowledge needed to understand Dynamic Information Retrieval Modeling

Simulating Information Retrieval Test Collections David Hawking, Bodo Billerbeck, Paul Thomas, Nick Craswell, 2022-06-01 Simulated test collections may find application in situations where real datasets cannot easily be accessed due to confidentiality concerns or practical inconvenience They can potentially support Information Retrieval IR experimentation tuning validation performance prediction and hardware sizing Naturally the accuracy and usefulness of results obtained from a simulation depend upon the fidelity and generality of the models which underpin it The fidelity of emulation of a real corpus is likely to be limited by the requirement that confidential information in the real corpus should not be able to be extracted from the emulated version We present a range of methods exploring trade offs between emulation fidelity and degree of preservation of privacy We present three different simple types of text generator which work at a micro level Markov models neural net models and substitution ciphers We also describe macro level methods where we can engineer macro properties of a corpus giving a range of models for each of the salient properties document length distribution word frequency distribution for independent and non independent cases word length and textual representation and corpus growth We present results of emulating existing corpora and for scaling up corpora by two orders of magnitude We show that simulated collections generated with relatively simple methods are suitable for some purposes and can be generated very quickly Indeed it may sometimes be feasible to embed a simple lightweight corpus generator into an indexer for the purpose of efficiency studies Naturally a corpus of artificial text cannot support IR experimentation in the absence of a set of compatible queries We discuss and experiment with published methods for query generation and query log emulation We present a proof of the pudding study in which we observe the predictive accuracy of

efficiency and effectiveness results obtained on emulated versions of TREC corpora The study includes three open source retrieval systems and several TREC datasets There is a trade off between confidentiality and prediction accuracy and there are interesting interactions between retrieval systems and datasets Our tentative conclusion is that there are emulation methods which achieve useful prediction accuracy while providing a level of confidentiality adequate for many applications Many of the methods described here have been implemented in the open source project SynthaCorpus accessible at <https://bitbucket.org/davidhawking/synthacorporus> Exploring Context in Information Behavior Naresh Kumar Agarwal,2022-05-31

The field of human information behavior runs the gamut of processes from the realization of a need or gap in understanding to the search for information from one or more sources to fill that gap to the use of that information to complete a task at hand or to satisfy a curiosity as well as other behaviors such as avoiding information or finding information serendipitously Designers of mechanisms tools and computer based systems to facilitate this seeking and search process often lack a full knowledge of the context surrounding the search This context may vary depending on the job or role of the person individual characteristics such as personality domain knowledge age gender perception of self etc the task at hand the source and the channel and their degree of accessibility and usability and the relationship that the seeker shares with the source Yet researchers have yet to agree on what context really means While there have been various research studies incorporating context and biennial conferences on context in information behavior there lacks a clear definition of what context is what its boundaries are and what elements and variables comprise context In this book we look at the many definitions of and the theoretical and empirical studies on context and I attempt to map the conceptual space of context in information behavior I propose theoretical frameworks to map the boundaries elements and variables of context I then discuss how to incorporate these frameworks and variables in the design of research studies on context We then arrive at a unified definition of context This book should provide designers of search systems a better understanding of context as they seek to meet the needs and demands of information seekers It will be an important resource for researchers in Library and Information Science especially doctoral students looking for one resource that covers an exhaustive range of the most current literature related to context the best selection of classics and a synthesis of these into theoretical frameworks and a unified definition The book should help to move forward research in the field by clarifying the elements variables and views that are pertinent In particular the list of elements to be considered and the variables associated with each element will be extremely useful to researchers wanting to include the influences of context in their studies Researching Serendipity in Digital Information Environments Lori McCay-Peet,Elaine G. Toms,2022-05-31

Chance luck and good fortune are the usual go to descriptors of serendipity a phenomenon aptly often coupled with famous anecdotes of accidental discoveries in engineering and science in modern history such as penicillin Teflon and Post it notes Serendipity however is evident in many fields of research in organizations in everyday life and there is more to it than luck implies While the phenomenon is strongly associated with in

person interactions with people places and things most attention of late has focused on its preservation and facilitation within digital information environments Serendipity's association with unexpected positive user experiences and outcomes has spurred an interest in understanding both how current digital information environments support serendipity and how novel approaches may be developed to facilitate it Research has sought to understand serendipity how it is manifested in people's personality traits and behaviors how it may be facilitated in digital information environments such as mobile applications and its impacts on an individual an organizational and a wider level Because serendipity is expressed and understood in different ways in different contexts multiple methods have been used to study the phenomenon and evaluate digital information environments that may support it This volume brings together different disciplinary perspectives and examines the motivations for studying serendipity the various ways in which serendipity has been approached in the research methodological approaches to build theory and how it may be facilitated Finally a roadmap for serendipity research is drawn by integrating key points from this volume to produce a framework for the examination of serendipity in digital information environments

The Notion of Relevance in Information Science Tefko Saracevic, 2022-05-31 Everybody knows what relevance is It is a ya know notion concept idea no need to explain whatsoever Searching for relevant information using information technology IT became a ubiquitous activity in contemporary information society Relevant information means information that pertains to the matter or problem at hand it is directly connected with effective communication The purpose of this book is to trace the evolution and with it the history of thinking and research on relevance in information science and related fields from the human point of view The objective is to synthesize what we have learned about relevance in several decades of investigation about the notion in information science This book deals with how people deal with relevance it does not cover how systems deal with relevance it does not deal with algorithms Spurred by advances in information retrieval IR and information systems of various kinds in handling of relevance a number of basic questions are raised But what is relevance to start with What are some of its properties and manifestations How do people treat relevance What affects relevance assessments What are the effects of inconsistent human relevance judgments on tests of relative performance of different IR algorithms or approaches These general questions are discussed in detail

Framing Privacy in Digital Collections with Ethical Decision Making Virginia Dressler, 2022-06-01 As digital collections continue to grow the underlying technologies to serve up content also continue to expand and develop As such new challenges are presented which continue to test ethical ideologies in everyday environs of the practitioner There are currently no solid guidelines or overarching codes of ethics to address such issues The digitization of modern archival collections in particular presents interesting conundrums when factors of privacy are weighed and reviewed in both small and mass digitization initiatives Ethical decision making needs to be present at the onset of project planning in digital projects of all sizes and we also need to identify the role and responsibility of the practitioner to make more virtuous decisions on behalf of those with no voice or awareness of potential

privacy breaches In this book notions of what constitutes private information are discussed as is the potential presence of such information in both analog and digital collections This book lays groundwork to introduce the topic of privacy within digital collections by providing some examples from documented real world scenarios and making recommendations for future research A discussion of the notion privacy as concept will be included as well as some historical perspective with perhaps one the most cited work on this topic for example Warren and Brandeis Right to Privacy 1890 Concepts from the The Right to Be Forgotten case in 2014 Google Spain SL Google Inc v Agencia Espa la de Protecci n de Datos Mario Costeja Gonz lez are discussed as to how some lessons may be drawn from the response in Europe and also how European data privacy laws have been applied The European ideologies are contrasted with the Right to Free Speech in the First Amendment in the U S highlighting the complexities in setting guidelines and practices revolving around privacy issues when applied to real life scenarios Two ethical theories are explored Consequentialism and Deontological Finally ethical decision making models will also be applied to our framework of digital collections Three case studies are presented to illustrate how privacy can be defined within digital collections in some real world examples Images in Social Media Susanne Ørnager,Haakon Lund,2022-06-01

This book focuses on the methodologies organization and communication of digital image collection research that utilizes social media content Image is here understood as a cultural conventional and commercial stock photo representation The lecture offers expert views that provide different interpretations of images and their potential implementations Linguistic and semiotic methodologies as well as eye tracking research are employed to both analyze images and comprehend how humans consider them including which salient features generally attract viewers attention This literature review covers image specifically photographic research since 2005 when major social media platforms emerged A citation analysis includes an overview of co citation maps that demonstrate the nexus of image research literature and the journals in which they appear Eye tracking tests whether scholarly templates focus on the proper features of an image such as people objects time etc and if a prescribed theme affects the eye movements of the observer The results may point to renewed requirements for building image search engines As it stands image management already requires new algorithms and a new understanding that involves text recognition and very large database processing The aim of this book is to present different image research areas and demonstrate the challenges image research faces The book s scope is by necessity far from comprehensive since the field of digital image research does not cover fake news image manipulation mobile photos etc these issues are very complex and need a publication of their own This book should primarily be useful for students in library and information science psychology and computer science **Third Space, Information Sharing, and Participatory**

Design Preben Hansen,Ina Fourie,Anika Meyer,2022-05-31 Society faces many challenges in workplaces everyday life situations and education contexts Within information behavior research there are often calls to bridge inclusiveness and for greater collaboration with user centered design approaches and more specifically participatory design practices

Collaboration and participation are essential in addressing contemporary societal challenges designing creative information objects and processes as well as developing spaces for learning and information and research interventions The intention is to improve access to information and the benefits to be gained from that This also applies to bridging the digital divide and for embracing artificial intelligence With regard to research and practices within information behavior it is crucial to consider that all users should be involved Many information activities i e activities falling under the umbrella terms of information behavior and information practices manifest through participation and thus methods such as participatory design may help unfold both information behavior and practices as well as the creation of information objects new models and theories Information sharing is one of its core activities For participatory design with its value set of democratic inclusive and open participation towards innovative practices in a diversity of contexts it is essential to understand how information activities such as sharing manifest itself For information behavior studies it is essential to deepen understanding of how information sharing manifests in order to improve access to information and the use of information Third Space is a physical virtual cognitive and conceptual space where participants may negotiate reflect and form new knowledge and worldviews working toward creative practical and applicable solutions finding innovative appropriate research methods interpreting findings proposing new theories recommending next steps and even designing solutions such as new information objects or services Information sharing in participatory design manifests in tandem with many other information interaction activities and especially information and cognitive processing Although there are practices of individual information sharing and information encountering information sharing mostly relates to collaborative information behavior practices creativity and collective decision making Our purpose with this book is to enable students researchers and practitioners within a multi disciplinary research field including information studies and Human Computer Interaction approaches to gain a deeper understanding of how the core activity of information sharing in participatory design in which Third Space may be a platform for information interaction is taking place when using methods utilized in participatory design to address contemporary societal challenges This could also apply for information behavior studies using participatory design as methodology We elaborate interpretations of core concepts such as participatory design Third Space information sharing and collaborative information behavior before discussing participatory design methods and processes in more depth We also touch on information behavior information practice and other important concepts Third Space information sharing and information interaction are discussed in some detail A framework with Third Space as a core intersecting zone platform and adaptive and creative space to study information sharing and other information behavior and interactions are suggested As a tool to envision information behavior and suggest future practices participatory design serves as a set of methods and tools in which new interpretations of the design of information behavior studies and eventually new information objects are being initiated involving multiple stakeholders in future information landscapes For this purpose we argue that Third Space can be used as

an intersection zone to study information sharing and other information activities but more importantly it can serve as a Third Space Information Behavior TSIB study framework where participatory design methodology and processes are applied to information behavior research studies and applications such as information objects systems and services with recognition of the importance of situated awareness

Information Communication Ma Feicheng, 2022-05-31 This book introduces fundamentals of information communication At first concepts and characteristics of information and information communication are summarized And then five classic models of information communication are introduced The mechanisms and fundamental laws of the information transmission process are also discussed In order to realize information communication impediments in information communication process are identified and analyzed For the purpose of investigating implications of Internet information communication patterns and characteristics of information communication in the Internet and Web 2 0 environment are also analyzed In the end case studies are provided for readers to understand the theory

Mobile Search Behaviors Dan Wu, Shaobo H. Liang, 2022-05-31 With the rapid development of mobile Internet and smart personal devices in recent years mobile search has gradually emerged as a key method with which users seek online information In addition cross device search also has been regarded recently as an important research topic As more mobile applications APPs integrate search functions a user s mobile search behavior on different APPs becomes more significant This book provides a systematic review of current mobile search analysis and studies user mobile search behavior from several perspectives including mobile search context APP usage and different devices Two different user experiments to collect user behavior data were conducted Then through the data from user mobile phone usage logs in natural settings we analyze the mobile search strategies employed and offer a context based mobile search task collection which then can be used to evaluate the mobile search engine In addition we combine mobile search with APP usage to give more in depth analysis such as APP transition in mobile search and follow up actions triggered by mobile search The study combining the mobile search with APP usage can contribute to the interaction design of APPs such as the search recommendation and APP recommendation Addressing the phenomenon of users owning more smart devices today than ever before we focus on user cross device search behavior We model the information preparation behavior and information resumption behavior in cross device search and evaluate the search performance in cross device search Research on mobile search behaviors across different devices can help to understand online user information behavior comprehensively and help users resume their search tasks on different devices

Building a Better World with Our Information William Jones, 2022-05-31 Part 1 in The Future of series covers the fundamentals of personal information management PIM and then explores the seismic shift already well underway toward a world where our information is always at hand thanks to our devices and forever on the web Part 2 Transforming Technologies to Manage Our Information provides a more focused look at technologies for managing information The opening chapter discusses natural interface technologies of input output to free us from keyboard screen

and mouse Successive chapters then explore technologies to save search and structure our information A concluding chapter introduces the possibility that we may see dramatic reductions in the clerical tax we pay as we work with our information Focus in this concluding Part 3 to the series shifts to the practical and to the near future What can we do now or soon to manage our information better And as we do so how might we build a better world Part 3 is in three chapters Chapter 10 Group Information Management and the Social Fabric in PIM How do we preserve and promote our PIM practices as we interact with others at home at school at work at play and in wider even global communities Chapter 11 PIM by Design What principles guide us How can developers build better tools for PIM How can the rest of us make better use of the tools we already have Chapter 12 To Each of Us Our Own concludes with an exploration of the ways each of us individually can develop better practices for the management of our information in service of the lives we wish to live and toward a better world we all must share

Information Architecture Wei Ding,Xia Lin,Michael Zarro,2022-06-01 Information Architecture is about organizing and simplifying information designing and integrating information spaces systems and creating ways for people to find and interact with information content Its goal is to help people understand and manage information and make the right decisions accordingly This updated and revised edition of the book looks at integrated information spaces in the web context and beyond with a focus on putting theories and principles into practice In the ever changing social organizational and technological contexts information architects not only design individual information spaces e g websites software applications and mobile devices but also tackle strategic aggregation and integration of multiple information spaces across websites channels modalities and platforms Not only do they create predetermined navigation pathways but they also provide tools and rules for people to organize information on their own and get connected with others Information architects work with multi disciplinary teams to determine the user experience strategy based on user needs and business goals and make sure the strategy gets carried out by following the user centered design UCD process via close collaboration with others Drawing on the authors extensive experience as HCI researchers User Experience Design practitioners and Information Architecture instructors this book provides a balanced view of the IA discipline by applying theories design principles and guidelines to IA and UX practices It also covers advanced topics such as iterative design UX decision support and global and mobile IA considerations Major revisions include moving away from a web centric view toward multi channel multi device experiences Concepts such as responsive design emerging design principles and user centered methods such as Agile Lean UX and Design Thinking are discussed and related to IA processes and practices

Scholarly Collaboration on the Academic Social Web Daqing He,Wei Jeng,2022-05-31 Collaboration among scholars has always been recognized as a fundamental feature of scientific discovery The ever increasing diversity among disciplines and complexity of research problems makes it even more compelling to collaborate in order to keep up with the fast pace of innovation and advance knowledge Along with the rapidly developing Internet communication technologies and the increasing popularity of the social

web we have observed many important developments of scholarly collaboration on the academic social web. In this book we review the rapid transform of scholarly collaboration on various academic social web platforms and examine how these platforms have facilitated academics throughout their research lifecycle from forming ideas, collecting data and authoring articles to disseminating findings. We refer to the term academic social web platforms in this book as a category of Web 2.0 tools or online platforms such as CiteULike, Mendeley, Academia.edu and ResearchGate that enable and facilitate scholarly information exchange and participation. We will also examine scholarly collaboration behaviors including sharing academic resources, exchanging opinions, following each other's research, keeping up with current research trends and most importantly building up their professional networks. Inspired by the model developed by Olson et al. (2000) on factors for successful scientific collaboration, our examination of the status of scholarly collaboration on the academic social web has four emphases: technology readiness, coupling work, building common ground and collaboration readiness. Finally, we talk about the insights and challenges of all these online scholarly collaboration activities imposed on the research communities who are engaging in supporting online scholarly collaboration. This book aims to help researchers and practitioners understand the development of scholarly collaboration on the academic social web and to build up an active community of scholars who are interested in this topic.

Scalability Challenges in Web Search Engines B. Barla Cambazoglu, Ricardo Baeza-Yates, 2022-06-01 In this book we aim to provide a fairly comprehensive overview of the scalability and efficiency challenges in large scale web search engines. More specifically, we cover the issues involved in the design of three separate systems that are commonly available in every web scale search engine: web crawling, indexing and query processing systems. We present the performance challenges encountered in these systems and review a wide range of design alternatives employed as solution to these challenges, specifically focusing on algorithmic and architectural optimizations. We discuss the available optimizations at different computational granularities ranging from a single computer node to a collection of data centers. We provide some hints to both the practitioners and theoreticians involved in the field about the way large scale web search engines operate and the adopted design choices. Moreover, we survey the efficiency literature providing pointers to a large number of relatively important research papers. Finally, we discuss some open research problems in the context of search engine efficiency.

Key Issues Regarding Digital Libraries Rao Shen, Marcos André Gonçalves, Edward A. Fox, 2022-05-31 This is the second book based on the 5S Societies, Scenarios, Spaces, Structures, Streams approach to digital libraries. DLs. Leveraging the first volume on Theoretical Foundations, we focus on the key issues of evaluation and integration. These cross-cutting issues serve as a bridge for those interested in DLs, connecting the introduction and formal discussion in the first book with the coverage of key technologies in the third book and of illustrative applications in the fourth book. These two topics have central importance in the DL field, allowing it to be treated scientifically as well as practically. In the scholarly world, we only really understand something if we know how to measure and evaluate it. In the Internet era of distributed

information systems we only can be practical at scale if we integrate across both systems and their associated content Evaluation of DLs must take place at multiple levels so we can address the different entities and their associated measures Thus for digital objects we assess accessibility pertinence preservability relevance significance similarity and timeliness Other measures are specific to higher level constructs like metadata collections catalogs repositories and services We tie these together through a case study of the 5SQual tool which we designed and implemented to perform an automatic quantitative evaluation of DLs Thus across the Information Life Cycle we describe metrics and software useful to assess the quality of DLs and demonstrate utility with regard to representative application areas archaeology and education Though integration has been a challenge since the earliest work on DLs we provide the first comprehensive 5S based formal description of the DL integration problem cast in the context of related work Since archaeology is a fundamentally distributed enterprise we describe ETANADL for integrating Near Eastern Archeology sites and information Thus we show how 5S based modeling can lead to integrated services and content While the first book adopts a minimalist and formal approach to DLs and provides a systematic and functional method to design and implement DL exploring services here we broaden to practical DLs with richer metamodels demonstrating the power of 5S for integration and evaluation

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Visual Information Retrieval Using Java And Lire Oge Marques Introduction

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