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Estimating the Query Difficulty for Information Retrieval

David Carmel
Elad Yom-Tov

*SYNTHESIS LECTURES ON INFORMATION
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Estimating The Query Difficulty For Information Retrieval

Elad Yom Tov

David Carmel, Elad Yom-Tov



Estimating The Query Difficulty For Information Retrieval Elad Yom Tov:

Estimating the Query Difficulty for Information Retrieval David Carmel, Elad Yom-Tov, 2010-04-04 Many information retrieval IR systems suffer from a radical variance in performance when responding to users queries Even for systems that succeed very well on average the quality of results returned for some of the queries is poor Thus it is desirable that IR systems will be able to identify difficult queries so they can be handled properly Understanding why some queries are inherently more difficult than others is essential for IR and a good answer to this important question will help search engines to reduce the variance in performance hence better servicing their customer needs Estimating the query difficulty is an attempt to quantify the quality of search results retrieved for a query from a given collection of documents This book discusses the reasons that cause search engines to fail for some of the queries and then reviews recent approaches for estimating query difficulty in the IR field It then describes a common methodology for evaluating the prediction quality of those estimators and experiments with some of the predictors applied by various IR methods over several TREC benchmarks Finally it discusses potential applications that can utilize query difficulty estimators by handling each query individually and selectively based upon its estimated difficulty Table of Contents Introduction The Robustness Problem of Information Retrieval Basic Concepts Query Performance Prediction Methods Pre Retrieval Prediction Methods Post Retrieval Prediction Methods Combining Predictors A General Model for Query Difficulty Applications of Query Difficulty Estimation Summary and Conclusions

Query Understanding for Search Engines Yi Chang, Hongbo Deng, 2020-12-01 This book presents a systematic study of practices and theories for query understanding of search engines These studies can be categorized into three major classes The first class is to figure out what the searcher wants by extracting semantic meaning from the searcher's keywords such as query classification query tagging and query intent understanding The second class is to analyze search queries and then translate them into an enhanced query that can produce better search results such as query spelling correction or query rewriting The third class is to assist users in refining or suggesting queries in order to reduce users search effort and satisfy their information needs such as query auto completion and query suggestion Query understanding is a fundamental part of search engines It is responsible to precisely infer the intent of the query formulated by the search user to correct spelling errors in his/her query to reformulate the query to capture its intent more accurately and to guide the user in formulating a query with precise intent The book will be invaluable to researchers and graduate students in computer or information science and specializing in information retrieval or web based systems as well as to researchers and programmers working on the development or improvement of products related to search engines

Interactive IR User Study Design, Evaluation, and Reporting Jiqun Liu, Chirag Shah, 2022-05-31 Since user study design has been widely applied in search interactions and information retrieval IR systems evaluation studies a deep reflection and meta evaluation of interactive IR IIR user studies is critical for sharpening the instruments of IIR research and improving the reliability and

validity of the conclusions drawn from IIR user studies To this end we developed a faceted framework for supporting user study design reporting and evaluation based on a systematic review of the state of the art IIR research papers recently published in several top IR venues n 462 Within the framework we identify three major types of research focuses extract and summarize facet values from specific cases and highlight the under reported user study components which may significantly affect the results of research Then we employ the faceted framework in evaluating a series of IIR user studies against their respective research questions and explain the roles and impacts of the underlying connections and collaborations among different facet values Through bridging diverse combinations of facet values with the study design decisions made for addressing research problems the faceted framework can shed light on IIR user study design reporting and evaluation practices and help students and young researchers design and assess their own studies

Analysis and Visualization of Citation Networks Dangzhi Zhao, Andreas Strotmann, 2015-02-01 Citation analysis the exploration of reference patterns in the scholarly and scientific literature has long been applied in a number of social sciences to study research impact knowledge flows and knowledge networks It has important information science applications as well particularly in knowledge representation and in information retrieval Recent years have seen a burgeoning interest in citation analysis to help address research management or information service issues such as university rankings research evaluation or knowledge domain visualization This renewed and growing interest stems from significant improvements in the availability and accessibility of digital bibliographic data both citation and full text and of relevant computer technologies The former provides large amounts of data and the latter the necessary tools for researchers to conduct new types of large scale citation analysis even without special access to special data collections Exciting new developments are emerging this way in many aspects of citation analysis This book critically examines both theory and practical techniques of citation network analysis and visualization one of the two main types of citation analysis the other being evaluative citation analysis To set the context for its main theme the book begins with a discussion of the foundations of citation analysis in general including an overview of what can and what cannot be done with citation analysis Chapter 1 An in depth examination of the generally accepted steps and procedures for citation network analysis follows including the concepts and techniques that are associated with each step Chapter 2 Individual issues that are particularly important in citation network analysis are then scrutinized namely field delineation and data sources for citation analysis Chapter 3 disambiguation of names and references Chapter 4 and visualization of citation networks Chapter 5 Sufficient technical detail is provided in each chapter so the book can serve as a practical how to guide to conducting citation network analysis and visualization studies While the discussion of most of the topics in this book applies to all types of citation analysis the structure of the text and the details of procedures examples and tools covered here are geared to citation network analysis rather than evaluative citation analysis This conscious choice was based on the authors observation that compared to evaluative citation analysis citation network analysis has not been

covered nearly as well by dedicated books despite the fact that it has not been subject to nearly as much severe criticism and has been substantially enriched in recent years with new theory and techniques from research areas such as network science social network analysis or information visualization

Trustworthy Policies for Distributed Repositories Reagan W. Moore, Hao Xu, Mike Conway, Arcot Rajasekar, Jon Crabtree, Helen R. Tibbo, 2022-05-31 A trustworthy repository provides assurance in the form of management documents event logs and audit trails that digital objects are being managed correctly The assurance includes plans for the sustainability of the repository the accession of digital records the management of technology evolution and the mitigation of the risk of data loss A detailed assessment is provided by the ISO 16363 2012 standard Space data and information transfer systems Audit and certification of trustworthy digital repositories This book examines whether the ISO specification for trustworthiness can be enforced by computer actionable policies An implementation of the policies is provided and the policies are sorted into categories for procedures to manage externally generated documents specify repository parameters specify preservation metadata attributes specify audit mechanisms for all preservation actions specify control of preservation operations and control preservation properties as technology evolves An application of the resulting procedures is made to enforce trustworthiness within National Science Foundation data management plans

Search User Interface Design Max L. Wilson, 2012 Designing a great Search User Interface SUI means leveraging the knowledge and skills from a variety of communities The aim of this book is to at least acknowledge if not integrate all of these perspectives to bring the reader into a multidisciplinary mindset for how we should think about SUI design

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

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Estimating The Query Difficulty For Information Retrieval Elad Yom Tov Introduction

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