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Human Computation

Edith Law
Luis von Ahn

***SYNTHESIS LECTURES ON ARTIFICIAL
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Human Computation Luis Von Ahn

Wenbin Ji



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Human Computation Edith Law, Luis von Ahn, 2011-08-08 Human computation is a new and evolving research area that centers around harnessing human intelligence to solve computational problems that are beyond the scope of existing Artificial Intelligence AI algorithms With the growth of the Web human computation systems can now leverage the abilities of an unprecedented number of people via the Web to perform complex computation There are various genres of human computation applications that exist today Games with a purpose e g the ESP Game specifically target online gamers who generate useful data e g image tags while playing an enjoyable game Crowdsourcing marketplaces e g Amazon Mechanical Turk are human computation systems that coordinate workers to perform tasks in exchange for monetary rewards In identity verification tasks users perform computation in order to gain access to some online content an example is reCAPTCHA which leverages millions of users who solve CAPTCHAs every day to correct words in books that optical character recognition OCR programs fail to recognize with certainty This book is aimed at achieving four goals 1 defining human computation as a research area 2 providing a comprehensive review of existing work 3 drawing connections to a wide variety of disciplines including AI Machine Learning HCI Mechanism Market Design and Psychology and capturing their unique perspectives on the core research questions in human computation and 4 suggesting promising research directions for the future Table of Contents Introduction Human Computation Algorithms Aggregating Outputs Task Routing Understanding Workers and Requesters The Art of Asking Questions The Future of Human Computation

Handbook of Human Computation Pietro Michelucci, 2013-12-04 This volume addresses the emerging area of human computation The chapters written by leading international researchers explore existing and future opportunities to combine the respective strengths of both humans and machines in order to create powerful problem solving capabilities The book bridges scientific communities capturing and integrating the unique perspective and achievements of each It coalesces contributions from industry and across related disciplines in order to motivate define and anticipate the future of this exciting new frontier in science and cultural evolution Readers can expect to find valuable contributions covering Foundations Application Domains Techniques and Modalities Infrastructure and Architecture Algorithms Participation Analysis Policy and Security and the Impact of Human Computation Researchers and professionals will find the Handbook of Human Computation a valuable reference tool The breadth of content also provides a thorough foundation for students of the field

Computation for Humanity Justyna Zander, Pieter Mosterman, 2018-10-03 The exponential progress and accessibility of computing has vastly increased data flows and revolutionized the practice of science engineering and communication Computing plays a critical role in advancing research across almost every scientific discipline Computation for Humanity Information Technology to Advance Society is a guide for the creation of services products and tools that facilitate support and enhance progress of humanity toward more sustainable life This book Provides a deep understanding of the practical applications of computation to solve human machine problems

Delivers insight into theoretical approaches in an accessible manner Provides a comprehensive overview of computational science and engineering applications in selected disciplines Crosses the boundaries between different domains and shows how they interrelate and complement one another Focuses on grand challenges and issues that matter for the future of humanity Shows different perspectives of computational thinking understanding and reasoning Provides a basis for scientific discoveries and enables adopting scientific theories and engineering practices from other disciplines Takes a step back to provide a human related abstraction level that is not ultimately seen in pure technological elaborations collections The editors provide a collection of numerous computation related projects that form a foundation from which to cross pollinate between different disciplines and further extensive collaboration They present a clear and profound understanding of computing in today s world and provide fundamental solutions to some of the most pertinent humanity related problems

Dynamic Quality Management for Cloud Labor Services Robert Kern,2014-09-06 How can a scalable and efficient quality management mechanism for cloud labor services be designed in a way that it delivers results with a well defined level of quality to the requester Cloud labor services are a specific form of crowdsourcing A coordination platform serves as an interface between requesters who need to get work done and a large crowd of workers who want to perform work An early example of such a platform is Amazon s Web marketplace Mturk on which service requesters can publish open calls for so called human intelligence tasks HITs Robert Kern s work makes a considerable contribution toward solving the quality problem for scalable human work On the basis of a comprehensive framework of cloud labor he develops a set of methods to conceptually measure and aggregate the quality of human work results implements a platform to put those methods to work and evaluates their application in a number of very compelling real world scenarios successfully combining concepts from statistics information technology and management Reading this book will be beneficial to novices in cloud labor services looking for orientation in this new field as well as to advanced researchers and practitioners developing cloud quality concepts

Research Methods in Human-Computer Interaction Jonathan Lazar,Jinjuan Heidi Feng,Harry Hochheiser,2017-04-28 Research Methods in Human Computer Interaction is a comprehensive guide to performing research and is essential reading for both quantitative and qualitative methods Since the first edition was published in 2009 the book has been adopted for use at leading universities around the world including Harvard University Carnegie Mellon University the University of Washington the University of Toronto HiOA Norway KTH Sweden Tel Aviv University Israel and many others Chapters cover a broad range of topics relevant to the collection and analysis of HCI data going beyond experimental design and surveys to cover ethnography diaries physiological measurements case studies crowdsourcing and other essential elements in the well informed HCI researcher s toolkit Continual technological evolution has led to an explosion of new techniques and a need for this updated 2nd edition to reflect the most recent research in the field and newer trends in research methodology This Research Methods in HCI revision contains updates throughout including more detail on

statistical tests coding qualitative data and data collection via mobile devices and sensors Other new material covers performing research with children older adults and people with cognitive impairments Comprehensive and updated guide to the latest research methodologies and approaches and now available in EPUB3 format choose any of the ePub or Mobi formats after purchase of the eBook Expanded discussions of online datasets crowdsourcing statistical tests coding qualitative data laws and regulations relating to the use of human participants and data collection via mobile devices and sensors New material on performing research with children older adults and people with cognitive impairments two new case studies from Google and Yahoo and techniques for expanding the influence of your research to reach non researcher audiences including software developers and policymakers

Intelligent Data Engineering and Automated Learning - IDEAL 2007 Hujun Yin, 2007-12-10 Annotation This book constitutes the refereed proceedings of the 8th International Conference on Intelligent Data Engineering and Automated Learning IDEAL 2007 held in Birmingham UK in December 2007 The 170 revised full papers presented were carefully reviewed and selected from more than 270 submissions The papers are organized in topical sections on learning and information processing data mining and information management bioinformatics and neuroinformatics agents and distributed systems financial engineering and modeling agent based approach to service sciences as well as neural evolutionary fusion algorithms and their applications

Predicting Human Decision-Making Ariel Rosenfeld, Sarit Kraus, 2022-05-31 Human decision making often transcends our formal models of rationality Designing intelligent agents that interact proficiently with people necessitates the modeling of human behavior and the prediction of their decisions In this book we explore the task of automatically predicting human decision making and its use in designing intelligent human aware automated computer systems of varying natures from purely conflicting interaction settings e g security and games to fully cooperative interaction settings e g autonomous driving and personal robotic assistants We explore the techniques algorithms and empirical methodologies for meeting the challenges that arise from the above tasks and illustrate major benefits from the use of these computational solutions in real world application domains such as security negotiations argumentative interactions voting systems autonomous driving and games The book presents both the traditional and classical methods as well as the most recent and cutting edge advances providing the reader with a panorama of the challenges and solutions in predicting human decision making

Knowledge Games Karen Schrier, 2016-06-15 Are games the knowledge producers of the future Imagine if new knowledge and insights came not just from research centers think tanks and universities but also from games of all things Video games have been viewed as causing social problems but what if they actually helped solve them This question drives Karen Schrier's Knowledge Games which seeks to uncover the potentials and pitfalls of using games to make discoveries solve real world problems and better understand our world For example so called knowledge games such as Foldit a protein folding puzzle game SchoolLife which crowdsources bullying interventions and Reverse the Odds in which mobile game players analyze breast cancer data are

already being used by researchers to gain scientific psychological and humanistic insights Schrier argues that knowledge games are potentially powerful because of their ability to motivate a crowd of problem solvers within a dynamic system while also tapping into the innovative data processing and computational abilities of games In the near future Schrier asserts knowledge games may be created to understand and predict voting behavior climate concerns historical perspectives online harassment susceptibility to depression or optimal advertising strategies among other things In addition to investigating the intersection of games problem solving and crowdsourcing Schrier examines what happens when knowledge emerges from games and game players rather than scientists professionals and researchers This accessible book also critiques the limits and implications of games and considers how they may redefine what it means to produce knowledge to play to educate and to be a citizen Explainable Human-AI Interaction Sarath Sreedharan, Anagha Kulkarni, Subbarao

Kambhampati, 2022-05-31 From its inception artificial intelligence AI has had a rather ambivalent relationship with humans swinging between their augmentation and replacement Now as AI technologies enter our everyday lives at an ever increasing pace there is a greater need for AI systems to work synergistically with humans One critical requirement for such synergistic human AI interaction is that the AI systems behavior be explainable to the humans in the loop To do this effectively AI agents need to go beyond planning with their own models of the world and take into account the mental model of the human in the loop At a minimum AI agents need approximations of the human's task and goal models as well as the human's model of the AI agent's task and goal models The former will guide the agent to anticipate and manage the needs desires and attention of the humans in the loop and the latter allow it to act in ways that are interpretable to humans by conforming to their mental models of it and be ready to provide customized explanations when needed The authors draw from several years of research in their lab to discuss how an AI agent can use these mental models to either conform to human expectations or change those expectations through explanatory communication While the focus of the book is on cooperative scenarios it also covers how the same mental models can be used for obfuscation and deception The book also describes several real world application systems for collaborative decision making that are based on the framework and techniques developed here Although primarily driven by the authors own research in these areas every chapter will provide ample connections to relevant research from the wider literature The technical topics covered in the book are self contained and are accessible to readers with a basic background in AI **Digital Libraries and Crowdsourcing** Mathieu Andro, 2018-01-19 Instead of outsourcing tasks to providers using labor intensive countries libraries around the world increasingly appeal to the crowds of Internet users making their relationship with users more collaborative These internet users can be volunteers or paid work consciously unconsciously or in the form of games They can provide the workforce skills knowledge or financial resources that libraries need in order to achieve unimaginable goals

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