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A Systematic Review of Human-Computer Interaction and Explainable Artificial Intelligence in Healthcare With Artificial Intelligence Techniques

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ABSTRACT Artificial intelligence (AI) is one of the emerging technologies. In recent decades, artificial intelligence (AI) has gained widespread acceptance in a variety of fields, including virtual support, healthcare, and security. Human-Computer Interaction (HCI) is a field that has been combining AI and human-computer engagement over the past several years in order to create an interactive intelligent system for user interaction. AI, in conjunction with HCI, is being used in a variety of fields by employing various algorithms and employing HCI to provide transparency to the user, allowing them to trust the machine. The comprehensive examination of both the areas of AI and HCI, as well as their subfields, has been explored in this work. The main goal of this article was to discover a point of intersection between the two fields. The understanding of Explainable Artificial Intelligence (XAI), which is a linking point of HCI and XAI, was gained through a literature review conducted in this research. The literature survey encompassed themes identified in the literature (such as XAI and its areas, major XAI aims, and XAI problems and challenges). The study's other major focus was on the use of AI, HCI, and XAI in healthcare. The poll also addressed the shortcomings in XAI in healthcare, as well as the field's future potential. As a result, the literature indicates that XAI in healthcare is still a novel subject that has to be explored more in the future.

INDEX TERMS Artificial intelligence, deep learning, explainable artificial intelligence, healthcare, human-computer interaction, human-centered design, machine learning, usability, user-centered design.

I. INTRODUCTION

Nowadays, digital technologies have been adopted for interaction in the modern world. Computing has become one of the most essential and integral parts of all industries and disciplines. Among all the advanced technologies, mobile computing has become one of the dominant factors in today's era [1]. Technological interaction has been given importance in many advanced areas. Interaction factors also have significant importance in the technical perspective for being easily used and managed by the person using it [2]. Artificial intelligence playing a vital role in making interaction more

flexible and intelligent by integrating itself within the systems with the help of different technology acceptance theories [3]. Human-Computer Interaction is the field that is mainly used for making technological interaction easy for the user [4]. Artificial intelligence, in other words is known for making interactions intelligent [5]. A new era has created a bridge between human-computer interaction and artificial intelligence by introducing Explainable artificial intelligence. The main focus of XAI is mainly to explain the interaction to the end-user in order to create a trustworthy environment [6]. Explainability in AI is a field that is active in a variety of domains, including medical healthcare, business processes, security, financial and legal decisions, autonomous vehicles, smartphones, and AI for designers [7].

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Long Term Humancomputer Interaction

Tonya Barrier



Long Term Humancomputer Interaction:

Long Term Human-Computer Interaction Richard C. Thomas,2012-12-06 This book is about longitudinal research in Human Computer Interaction HCI Since the early 1980s much has been understood about the problems of novices learning new systems as well as the performance of expert users However there is still a lot to discover about the transition from novice to expert and its implications for the design of systems For instance How long does it take to become expert Does early experience of a system have any effect on subsequent flexibility How can flexibility and long term learning be promoted Are there strong constraints that should be taken into account in the design of adaptive systems Longitudinal research in HCI has been rare for many reasons There is always pressure to obtain results the current climate of short termism does nothing to promote a longer perspective The field of HCI itself is changing fast and there are often virgin technologies to explore which can be more exciting and potentially profitable than research aimed at basic understanding There is also a possibly mistaken view that longitudinal studies are always inherently expensive The present volume grew out of a project at Sydney University The very first ideas were discussed in 1989 In 1991 data logging started of a mainly undergraduate population using a Unix based editor sam Pike 1987 Due to good fortune the system continued unchanged into a second year and it became clear data collection had very low marginal costs

Human-Computer Interaction. Novel User Experiences Masaaki Kurosu,2016-07-04 The 3 volume set LNCS 9731 9732 and 9733 constitutes the refereed proceedings of the 18th International Conference on Human Computer Interaction HCII 2016 held in Toronto ON Canada in July 2016 The total of 1287 papers and 186 posters presented at the HCII 2016 conferences and were carefully reviewed and selected from 4354 submissions The papers thoroughly cover the entire field of Human Computer Interaction addressing major advances in knowledge and effective use of computers in a variety of application areas The volumes constituting the full 27 volume set of the conference proceedings

Long Term Human-Computer Interaction Richard C Thomas,1998-09-18 **ACM Transactions on Computer-human Interaction** ,2005 Presents original research that spans the field of human computer interaction The primary emphasis has been on results of broad application but the journal also publishes work focused on special domains on special requirements on ethical issues the full range of design development and use of interactive systems

Review of Human Computer Interaction and Computer Vision Gabriel Kabanda,2019-09-16 Academic Paper from the year 2019 in the subject Computer Science General grade 4 0 language English abstract This review describes or analyses the trends and best practices in Human Computer Interaction and Computer Vision Human Computer Interaction HCI is a computer user interface which the user of the system works with to achieve their given tasks and sees the system in use Information Technology IT is essentially an integrated person machine system that provides information support operations management and decision making Human Computer Interaction HCI focuses on the interactions between human and computer systems to achieve the IT system functionality user experience usability the support of user interaction

effectiveness Users are increasingly preferring the use of online business systems and so are becoming intolerant of systems which are not user friendly The human factor is an attribute physical or cognitive which is specific to people that use a system and how it influences the normal operations of the system as well as the achievement of human environment equilibriums Surface technology eliminates input output devices through a touch sensitive feature which plays the role of input output devices as a result of the merger between the physical and the virtual world Through surface technology the user eliminates the use of GUI mediums and reduces the gap between the physical and the virtual world There are two classes of surface technology one for the display and the other one which uses a touch sensitive mechanism for the interpretation of user signals New approaches and methods are now needed in HCI to equip researchers with a better understanding of designing interactive systems There are new interactive possibilities to be explored in audio based mobile technology The increasing popularity of smartphones has proved the portability adaptability and always on capability of geolocate interactive systems HCI bridges the gap between humans and computing devices with respect to observation of interactions analysis of the involved interactions and the the human consequences of the interaction The focus of HCI is the practice of usability which includes look and feel features appeal utility efficiency effectiveness and safety *Advances in Human - Computer Interaction* Jakob Nielsen,1988-05 The author uses this series to try to fight the information overload experienced during the 1980s and 1990s Its concentration is on surveying important areas providing an overview of recent advancements and surveying interesting specific design or development projects to show how the state of the art is being carried out Essays by specialists that speculate on important trends in the field are also included Human Factors in Computing Systems Association for Computing Machinery,Association for Computing Machinery Staff,Joyce L. Vedral,1991 This volume contains papers panel overviews descriptions of demonstrations and videos laboratory overviews abstracts of special interest group meetings and doctoral consortium presentation and titles of posters short papers workshops and tutorials from the annual conference on Human Factors in Computing Systems sponsored by ACM SIGCHI *Human Factors in Computing Systems* ,1992 **Design of Computing Systems: Social and ergonomic considerations** Michael James Smith,Gavriel Salvendy,Richard J. Koubek,1997 Human-computer Interaction Derek Scott,1991 **Symbiosis of Human and Artifact: Human and social aspects of human-computer interaction** Yūichirō Anzai,Katsuhiko Ogawa,Hirohiko Mori,1995 Presented here are papers selected from those submitted to the Sixth International Conference on Human Computer Interaction HCI International 95 held in Tokyo July 1995 A total of 1 298 individuals from 36 countries submitted their work for presentation at this first major international meeting on human computer interaction held in Asia Volume A covers the latest advances in the research of future computing and system design as well as their relevant application in the wide field of human computer interaction Volume B contains selected papers in the areas of ergonomics and social aspects of computer systems **Human Computer Interaction Development and Management** Tonya

Barrier,2002 Organizations today realize that information systems must be managed Management can no longer continue to introduce components into information systems without studying the effectiveness feasibility and efficiency of the individual components of an information system Human Computer Interaction Development and Management contains the most recent research concerning IS evolution in organizations including not only hardware software data information and networks but also people Integration of these key components is paramount to the success of organizations today Perspectives on HCI Andrew Monk,G. Nigel Gilbert,1995 The field of human computer interaction HCI has attracted researchers with interests as diverse as formal mathematics ethnography cognitive psychology and conversation analysis Each approach has different assumptions and perspectives on the practical problem of designing more effective systems Perspectives on HCI Diverse Approaches contains 10 tutorial chapters each written to illustrate a particular approach to HCI The authors are all international authorities in their particular fields The book will be of interest to researchers and students in computer science management science psychology human factors ergonomics and sociology who want to know how other disciplines approach the practical problem of making computers into more effective tools for people to use Key Features Covers widely different research disciplines Written by international authorities in each area Provides accessible and concise introductions to important areas and approaches Each chapter contains a list of references for further reading ACM SIGCHI Curricula for Human-computer Interaction ,1992 In August 1988 the SIGCHI Executive Committee authorized a multi year project to develop a set of curriculum recommendations for education in Human Computer Interaction This report represents that work The Curriculum Development Group has attempted to create an heuristic structure with which and within which other can work to improve the state of education in human computer interaction The example course descriptions represent a set of possible content course structures that educators can use as a starting point and further iterations are expected and welcomed **Berkshire Encyclopedia of Human-computer Interaction** William Sims Bainbridge,2004 Examines how people interact and communicate via computers robots information systems and the Internet Articles present current research in sociology behavioral science anthropology engineering computer science Written for the educated layperson Color in Human-computer Interaction Chien-Hsiung Chen,1998 **Artificial Social Constructivism for Long Term Human Computer Interaction** Kristina Milanovic,2021 Human-computer Interaction Gavriel Salvendy,Michael James Smith,1993 *Human-computer Interaction* Michitaka Hirose,2001 **IHM-HCI 2001** Jean Vanderdonckt,Ann Blandford,Alain Derycke,2001

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