

# 24 AFFECTIVE COMPUTING APPLICATIONS AND USE CASES

## Marketing

- Marketing communications
- Market research
- Content optimization

## Customer Service

- Intelligent call routing
- Call recommendations
- Continuous improvement

## Human Resources

- Recruitment
- Employee training
- Tracking employee satisfaction

## Healthcare

- Patient care
- Medical diagnosis
- Counseling

## Insurance

- Fraud detection

## Retail

- In-store shopping experience

## Driving assistance

- Safety
- Autonomous driving performance

## Education

- Measuring effectiveness
- Supporting autistic children

## Gaming

- Testing
- Adaptive games

## Government

- Understanding population
- Tracking citizen reactions

## Technology

- Integration with IoT

## Other

- Workplace design

# Affective Computing

**Lingsheng Yao**



## **Affective Computing:**

**Applied Affective Computing** Leimin Tian, Sharon Oviatt, Michal Muszynski, Brent Chamberlain, Jennifer Healey, Akane Sano, 2022-02-04 Affective computing is a nascent field situated at the intersection of artificial intelligence with social and behavioral science. It studies how human emotions are perceived and expressed which then informs the design of intelligent agents and systems that can either mimic this behavior to improve their intelligence or incorporate such knowledge to effectively understand and communicate with their human collaborators. Affective computing research has recently seen significant advances and is making a critical transformation from exploratory studies to real world applications in the emerging research area known as applied affective computing. This book offers readers an overview of the state of the art and emerging themes in affective computing including a comprehensive review of the existing approaches to affective computing systems and social signal processing. It provides in depth case studies of applied affective computing in various domains such as social robotics and mental well being. It also addresses ethical concerns related to affective computing and how to prevent misuse of the technology in research and applications. Further this book identifies future directions for the field and summarizes a set of guidelines for developing next generation affective computing systems that are effective, safe and human centered. For researchers and practitioners new to affective computing this book will serve as an introduction to the field to help them in identifying new research topics or developing novel applications. For more experienced researchers and practitioners the discussions in this book provide guidance for adopting a human centered design and development approach to advance affective computing.

*Affective Computing* Rosalind W. Picard, 2000-07-24 According to Rosalind Picard if we want computers to be genuinely intelligent and to interact naturally with us we must give computers the ability to recognize, understand, even to have and express emotions. The latest scientific findings indicate that emotions play an essential role in decision making, perception, learning, and more, that is they influence the very mechanisms of rational thinking. Not only too much but too little emotion can impair decision making. According to Rosalind Picard if we want computers to be genuinely intelligent and to interact naturally with us we must give computers the ability to recognize, understand, even to have and express emotions. Part 1 of this book provides the intellectual framework for affective computing. It includes background on human emotions, requirements for emotionally intelligent computers, applications of affective computing, and moral and social questions raised by the technology. Part 2 discusses the design and construction of affective computers. Although this material is more technical than that in Part 1 the author has kept it less technical than typical scientific publications in order to make it accessible to newcomers. Topics in Part 2 include signal based representations of emotions, human affect recognition as a pattern recognition and learning problem, recent and ongoing efforts to build models of emotion for synthesizing emotions in computers, and the new application area of affective wearable computers.

**A Blueprint for Affective Computing** Klaus R. Scherer, Tanja Bänziger, Etienne Roesch, 2010-09-23 Affective

computing is a branch of computing concerned with the theory and construction of machines which can detect respond to and simulate human emotional states This book presents an interdisciplinary exploration of this rapidly expanding field aimed at those in psychology computational neuroscience computer science and AI The Oxford Handbook of Affective Computing Rafael A. Calvo, Sidney D'Mello, Jonathan Gratch, Arvid Kappas, 2015-01-15 Affective Computing is a growing multidisciplinary field encompassing computer science engineering psychology education neuroscience and many other disciplines It explores how affective factors influence interactions between humans and technology how affect sensing and affect generation techniques can inform our understanding of human affect and on the design implementation and evaluation of systems that intricately involve affect at their core The Oxford Handbook of Affective Computing will help both new and experienced researchers identify trends concepts methodologies and applications in this burgeoning field The volume features 41 chapters divided into five main sections history and theory detection generation methodologies and applications Section One begins with a look at the makings of AC and a historical review of the science of emotion Chapters discuss the theoretical underpinnings of AC from an interdisciplinary perspective involving the affective cognitive social media and brain sciences Section Two focuses on affect detection or affect recognition which is one of the most commonly investigated areas in AC Section Three examines aspects of affect generation including the synthesis of emotion and its expression via facial features speech postures and gestures Cultural issues in affect generation are also discussed Section Four features chapters on methodological issues in AC research including data collection techniques multimodal affect databases emotion representation formats crowdsourcing techniques machine learning approaches affect elicitation techniques useful AC tools and ethical issues in AC Finally Section Five highlights existing and future applications of AC in domains such as formal and informal learning games robotics virtual reality autism research healthcare cyberpsychology music deception reflective writing and cyberpsychology With chapters authored by world leaders in each area The Oxford Handbook of Affective Computing is suitable for use as a textbook in undergraduate or graduate courses in AC and will serve as a valuable resource for students researchers and practitioners across the globe **Affect and Emotion in Human-Computer Interaction**

Christian Peter, Russell Beale, 2008-08-25 Affect and emotion play an important role in our everyday lives They are present whatever we do wherever we are and wherever we go without us being aware of them for much of the time When it comes to interaction be it with humans technology or humans via technology we suddenly become more aware of emotion either by seeing the other's emotional expression or by not getting an emotional response while anticipating one Given this it seems only sensible to explore affect and emotion in human computer interaction to investigate the underlying principles to study the role they play to develop methods to quantify them and to finally build applications that make use of them This is the research field for which over ten years ago Rosalind Picard coined the phrase affective computing The present book provides an account of the latest work on a variety of aspects related to affect and emotion in human technology interaction It covers

theoretical issues user experience and design aspects as well as sensing issues and reports on a number of affective applications that have been developed in recent years

**Affective Computing** Jimmy Or, 2008-05-01 This book provides an overview of state of the art research in Affective Computing It presents new ideas original results and practical experiences in this increasingly important research field The book consists of 23 chapters categorized into four sections Since one of the most important means of human communication is facial expression the first section of this book Chapters 1 to 7 presents a research on synthesis and recognition of facial expressions Given that we not only use the face but also body movements to express ourselves in the second section Chapters 8 to 11 we present a research on perception and generation of emotional expressions by using full body motions The third section of the book Chapters 12 to 16 presents computational models on emotion as well as findings from neuroscience research In the last section of the book Chapters 17 to 22 we present applications related to affective computing

*Affective Computing and Intelligent Interaction* Jianhua Tao, Tieniu Tan, 2005-10-27 This book constitutes the refereed proceedings of the First International Conference on Affective Computing and Intelligent Interaction ACII 2005 held in Beijing China in October 2005 as an associated event of ICCV 2005 the International Conference on Computer Vision The 45 revised full papers and 81 revised poster papers presented were carefully reviewed and selected from 198 submissions They cover a wide range of topics such as facial expression recognition face animation emotional speech synthesis intelligent agent and virtual reality The papers are organized in topical sections on affective face and gesture processing affective speech processing evaluation of affective expressivity affective database annotation and tools psychology and cognition of affect and affective interaction and systems and applications

**Emotional Machines** Catrin Misselhorn, Tom Poljanšek, Tobias Störzinger, Maike Klein, 2023-09-01 Can machines simulate express or even have emotions Is it a good to build such machines How do humans react emotionally to them and how should such devices be treated from a moral point of view This volume addresses these and related questions by bringing together perspectives from affective computing and emotional human machine interaction combining technological approaches with those from the humanities and social sciences It thus relates disciplines such as philosophy computer science technology psychology sociology design and art The volume offers readers interested in the phenomenon of emotional machines new perspectives from a variety of disciplines and addresses fundamental questions that will become pressing in the foreseeable future as emotional machines increasingly populate our everyday lives

**Affective Interactions** Ana Paiva, 2000-12-13 Affective computing is a fascinating new area of research emerging in computer science It dwells on problems where computing is related to arises from or deliberately influences emotions Picard 1997 Following this new research direction and considering the human element as crucial in designing and implementing interactive intelligent interfaces affective computing is now influencing the way we shape design construct and evaluate human computer interaction and computer mediated communication This book originates from a workshop devoted to affective

interactions It presents revised full versions of several papers accepted in preliminary version for the workshop and various selectively solicited papers by key people as well as an introductory survey by the volume editor and interview with Rosaling Picard a pioneer researcher in the field The book competently assesses the state of the art in this fascinating new field

**Affective Computing and Intelligent Interaction** Sidney D'Mello, Arthur Graesser, Bjoern Schuller, Jean-Claude Martin, 2011-09-23 This volume constitutes the refereed proceedings of the Fourth International Conference on Affective Computing and Intelligent Interaction ACII 2011 held in Memphis TN USA in October 2011 Affective Computing and Sentiment Analysis Khurshid Ahmad, 2011-08-24 This volume maps the watershed areas between two holy grails of computer science the identification and interpretation of affect including sentiment and mood The expression of sentiment and mood involves the use of metaphors especially in emotive situations Affect computing is rooted in hermeneutics philosophy political science and sociology and is now a key area of research in computer science The 24 7 news sites and blogs facilitate the expression and shaping of opinion locally and globally Sentiment analysis based on text and data mining is being used in the looking at news and blogs for purposes as diverse as brand management film reviews financial market analysis and prediction homeland security There are systems that learn how sentiments are articulated This work draws on and informs research in fields as varied as artificial intelligence especially reasoning and machine learning corpus based information extraction linguistics and psychology Affective Computing and Interaction: Psychological, Cognitive and Neuroscientific Perspectives Gökay, Didem, Yildirim, Gelsen, 2010-10-31 Since interactions may occur between animals humans or computational agents an interdisciplinary approach which investigates foundations of affective communication in a variety of platforms is indispensable In the field of affective computing a collection of research merging decades of research on emotions in psychology cognition and neuroscience will inspire creative future research projects and contribute to the prosperity of this emerging field Affective Computing and Interaction Psychological Cognitive and Neuroscientific Perspectives examines the current state and the future prospects of affect in computing within the context of interactions Uniting several aspects of affective interactions and topics in affective computing this reference reviews basic foundations of emotions furthers an understanding of the contribution of affect to our lives and concludes by revealing current trends and promising technologies for reducing the emotional gap between humans and machines all within the context of interactions

**Affective Information Processing** Jianhua Tao, Tieniu Tan, 2008-12-02 Affective information processing assigns computers the human like capabilities of observation interpretation and generation of affect features It is an important topic for harmonious human computer interaction by increasing the quality of human computer communication and improving the intelligence of the computer Discussing state of art of the research in affective information processing this book summarises key technologies researched such as facial expression recognition face animation emotional speech synthesis intelligent agent and virtual reality The detailed discussion covers a wide range of topics including hot topics which look to challenge

and improve current research work Written to provide an opportunity for scientists engineers and graduate students to learn problems solutions and technologies in the topic area this book will provide insight and prove a valuable reference tool

**Multimodal Affective Computing** Ramón Zatarain Cabada,Héctor Manuel Cárdenas López,Hugo Jair Escalante,2023-06-26 This book explores AI methodologies for the implementation of affective states in intelligent learning environments Divided into four parts Multimodal Affective Computing Technologies and Applications in Learning Environments begins with an overview of Affective Computing and Intelligent Learning Environments from their fundamentals and essential theoretical support up to their fusion and some successful practical applications The basic concepts of Affective Computing Machine Learning and Pattern Recognition in Affective Computing and Affective Learning Environments are presented in a comprehensive and easy to read manner In the second part a review on the emerging field of Sentiment Analysis for Learning Environments is introduced including a systematic descriptive tour through topics such as building resources for sentiment detection methods for data representation designing and testing the classification models and model integration into a learning system The methodologies corresponding to Multimodal Recognition of Learning Oriented Emotions are presented in the third part of the book where topics such as building resources for emotion detection methods for data representation multimodal recognition systems and multimodal emotion recognition in learning environments are presented The fourth and last part of the book is devoted to a wide application field of the combination of methodologies such as Automatic Personality Recognition dealing with issues such as building resources for personality recognition methods for data representation personality recognition models and multimodal personality recognition for affective computing This book can be very useful not only for beginners who are interested in affective computing and intelligent learning environments but also for advanced and experts in the practice and developments of the field It complies an end to end treatment on these subjects especially with educational applications making it easy for researchers and students to get on track with fundamentals established methodologies conventional evaluation protocols and the latest progress on these subjects

**Humanizing Technology With Emotional Intelligence** Tikadar, Subrata,Liu, Haipeng,Bhattacharya, Pronaya,Bhattacharya, Samit,2024-12-23 In an era where technology permeates every aspect of our lives the imperative for sentient systems has never been greater This necessity stems from the recognition that effective human computer interaction HCI transcends mere transactional exchanges aspiring instead to foster connections that are as nuanced and empathetic as those between humans Emotional intelligence in computing systems therefore is not a luxury but a prerequisite for creating technologies that enhance rather than hinder our daily lives Affective computing the interdisciplinary domain at the heart of this endeavor bridges the gap between human emotional experience and computational technology aiming to imbue machines with the ability to detect interpret and respond to human emotions Humanizing Technology With Emotional Intelligence delves into the why and how of incorporating emotional intelligence into

computing systems The book provides a comprehensive overview of both the theoretical foundations and the practical applications of affective computing in HCI Covering topics such as automotive safety holistic student development and social robotics this book is an excellent resource for academicians researchers graduate and postgraduate students software developers product managers and more

**Affect and Emotion in Human-Computer Interaction**, 2008 Annotation  
Affect and emotion play an important role in our everyday lives They are present whatever we do wherever we are and wherever we go without us being aware of them for much of the time When it comes to interaction be it with humans technology or humans via technology we suddenly become more aware of emotion either by seeing the other s emotional expression or by not getting an emotional response while anticipating one Given this it seems only sensible to explore affect and emotion in human computer interaction to investigate the underlying principles to study the role they play to develop methods to quantify them and to finally build applications that make use of them This is the research field for which over ten years ago Rosalind Picard coined the phrase affective computing The present book provides an account of the latest work on a variety of aspects related to affect and emotion in human technology interaction It covers theoretical issues user experience and design aspects as well as sensing issues and reports on a number of affective applications that have been developed in recent years

**Universal Access in Human-Computer Interaction** Margherita Antona,Constantine Stephanidis,2024-05-31 This three volume set LNCS 14696 14698 constitutes the refereed proceedings of the 18th International Conference on Universal Access in Human Computer Interaction UAHCI 2024 held as part of the 26th International Conference HCI International 2024 in Washington DC USA during June 29 July 4 2024 The total of 1271 papers and 309 posters included in the HCII 2024 proceedings was carefully reviewed and selected from 5108 submissions The UAHCI 2024 proceedings were organized in the following topical sections Part I User Experience Design and Evaluation for Universal Access AI for Universal Access Part II Universal Access to Digital Services Design for Cognitive Disabilities Universal Access to Virtual and Augmented Reality Part III Universal Access to Learning and Education Universal Access to Health and Wellbeing Universal Access to Information and Media

**The Oxford Handbook of Affective Computing**  
Rafael A. Calvo,Sidney D'Mello,Jonathan Matthew Gratch,Arvid Kappas,2015 The Oxford Handbook of Affective Computing is the definitive reference for research in Affective Computing AC a growing multidisciplinary field encompassing computer science engineering psychology education neuroscience and many other disciplines The handbook explores how affective factors influence interactions between humans and technology how affect sensing and affect generation techniques can inform our understanding of human affect and on the design implementation and evaluation of systems that intricately involve affect at their core Suitable for use as a textbook in undergraduate or graduate courses in AC the volume is a valuable resource for students researchers and practitioners worldwide

*Affective Computing and Intelligent Interaction*  
Ana Paiva,2007-08-30 This book constitutes the refereed proceedings of the Second International Conference on Affective

Computing and Intelligent Interaction ACII 2007 held in Lisbon Portugal in September 2007 The 57 revised full papers and 4 revised short papers presented together with the extended abstracts of 33 poster papers were carefully reviewed and selected from 151 submissions The papers are organized in topical sections on affective facial expression and recognition affective body expression and recognition affective speech processing affective text and dialogue processing recognising affect using physiological measures computational models of emotion and theoretical foundations affective databases annotations tools and languages affective sound and music processing affective interactions systems and applications as well as evaluating affective systems *Affective Computing and Intelligent Interaction* Sidney D'Mello, Arthur Graesser, Bjoern Schuller, Jean-Claude Martin, 2011-10-18 The two volume set LNCS 6974 and LNCS 6975 constitutes the refereed proceedings of the Fourth International Conference on Affective Computing and Intelligent Interaction ACII 2011 held in Memphis TN USA in October 2011 The 135 papers in this two volume set presented together with 3 invited talks were carefully reviewed and selected from 196 submissions The papers are organized in topical sections on recognition and synthesis of human affect affect sensitive applications methodological issues in affective computing affective and social robotics affective and behavioral interfaces relevant insights from psychology affective databases Evaluation and annotation tools

Affective Computing: Bestsellers in 2023 The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous captivating novels enthralling the hearts of readers worldwide. Lets delve into the realm of popular books, exploring the fascinating narratives that have charmed audiences this year. The Must-Read : Colleen Hoover's "It Ends with Us" This heartfelt tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover masterfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can triumph. Uncover the Best : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This captivating historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids absorbing storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Affective Computing : Delia Owens "Where the Crawdads Sing" This evocative coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens spins a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting. These bestselling novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of compelling stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a brilliant and thrilling novel that will keep you guessing until the very end. The novel is a warning tale about the dangers of obsession and the power of evil.

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