

## Editorial Preface

# Special Issue on Amalgamation of Human and Computer Vision The Ambient Intelligence

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Ambient Intelligence (AmI) is a new paradigm in Information Technology that has potential for great impact in the future. The vision of AmI is that the people will be surrounded by intelligent objects that can sense the context and respond according to the desire of the people. AmI is a multidisciplinary topic, since it combines the features of many of the areas in Computer Science.

In the last five years, there has been significant advances in three promising technology areas: virtual environments, in which 3D displays and interaction devices immerse the user in a synthesized world, mobile communication and sensors, in which increasingly small and inexpensive terminals and wireless networking allow users to roam the real world without being limited to stationary machines. The merging of these areas allows the emergence of a new vision: the Ambient Intelligence (AmI). An important aspect of AmI has to do with interaction. On one side, there is a motivation to reduce the human-computer interaction as the system is supposed to use its intelligence to infer situations and user needs from the recorded activities, as if a passive human assistant was observing activities unfold with the expectation to help when (and only if) required. On the other side, a diversity of users may need or voluntarily seek direct interaction with the system to indicate preferences and needs. The entire environment around us, homes and offices, cars and cities, will collectively develop a pervasive network of intelligent devices that will cooperatively gather, process, and transport information.

Ambient Intelligence has found applications in various domains and fields. The main focus of this special issue is to provide the latest advancements in the problem domain of the Amalgamation of Human and Computer Vision: The Ambient Intelligence.

The aim of the special issue is to provide a quality publication with innovative ideas and implementation methodology to upcoming and budding researchers and users in the modern-day era.

The unique characteristics of the special issue are:

- Original research works from the area of ambient computing and intelligence with an emphasis on application in varied fields. The aim of the special issue was providing a quality publication with innovative ideas and implementation methodology to upcoming buddy researchers and users in the modern day era like: Visual Information Processing in Human Vision (state of the art), Cognitive Models, Object Recognition in Human Vision (neural mechanisms of object recognition), Scale space models in Human and Computer vision, Computer Vision Models for Simulation of Biological Vision, Image Classification Approaches Inspired from Biological Perception, Saliency Maps based on Human Vision, Human interaction with autonomous systems, Innovative applications of AI to ambient intelligence, Interacting with ambient intelligence, Mobile Computing, Natural and multimodal interaction styles and user interfaces for ambient computing, Objects, devices, and environments that embody ambient intelligence,

Pervasive informatics, Ambient computing and Internet of things, Ambient Intelligence, Ambient Intelligence Applications, Ambient Computing and Robotics, Ambient intelligence and smart environment, Nanotechnology, smart devices, sensors etc., Interoperability, wired and wireless networks, service-oriented architecture, semantic web, Service discovery, auto-configuration, end-user programmable devices and systems, Intelligent agents, multimodal interaction, context awareness, Self-testing and self repairing software, privacy ensuring technology and Ambient Security.

- The proposed publication would be very well targeted towards providing quality, best and latest research by eminent researchers considering the fact that how such researches affect and make significant influences on common people in their everyday life.
- The area which are part of published work will be having a significant influence for the business users, common people and has a great impact on the society.

This special issue is a collection of four papers which are written by eminent professors, researchers and Industry people from different countries. The papers were initially peer reviewed by the Editorial Review Board members, reviewers and industry people who themselves span over many countries.

In the paper, Approaches and Applications of Virtual Reality and Gesture Recognition, Interaction with a computer has been the center of innovation ever since the advent of input devices. From simple punch cards to keyboards, there are number of novel ways of interaction with computers which influence the user experience. Communicating using gestures is perhaps one of the most natural ways of interaction. Gesture recognition as a tool for interpreting signs constitutes a pivotal area in gesture recognition research where accuracy of the algorithm and the ease of usability determine the effectiveness of the algorithm or system. Introducing gesture based interaction in Virtual reality applications has not only helped solve problems which were commonly reported in traditional Virtual Reality systems, but also gives user a more natural and enriching experience. This paper concentrates on comparison of different systems and identifying their similarities, differences, advantages and demerits which can play a key role in designing a system using such technologies.

In the paper, Concoction of Ambient Intelligence and Big Data for Better Patient Ministration Services, authors discussed that the term Ambient Intelligence (AmI) encompasses other technologies such as ubiquitous communication, pervasive computing and ubiquitous computing. Hospitals can improve their working by monitoring the health of the patients and performing automatic analysis of various and health parameters inside the room. Security mechanisms can also be enhanced by only allowing authorized hospital staff and attendants in the ward. With the advent of Ambient Intelligence and the congenial political environment, the focus is now shifting to providing better healthcare at homes than at traditional medical centers; also, authors implemented an algorithm in which they consider a specific room of a hospital as the environment, with a patient monitored for health and security reasons. If anything is not allowed for the particular patient or there is some unwanted variations in the health parameters of the patient, the alarm was rang and the patient's assistants were notified.

In the paper, Towards a New Model of Storage and Access to Data in Big Data and Cloud Computing, authors proposed that the technological revolution integrating multiple information sources and extension of computer science in different sectors led to the explosion of the data quantities, which reflects the scaling of volumes, numbers and types. These massive increases have resulted in the development of new location techniques and access to data. The final steps in this evolution have emerged new technologies: Cloud and Big Data. The reference implementation of the Clouds and Big Data storage is incontestably the Hadoop Distributed File System (HDFS). This latter is based on the separation of metadata to data that consists in the centralization and isolation of the metadata of storage servers. In this paper, the authors propose an approach to improve the service metadata for Hadoop to maintain consistency without much compromising performance and scalability of metadata

by suggesting a mixed solution between centralization and distribution of metadata to enhance the performance and scalability of the model.

In the paper, PCA as Dimensionality Reduction for Large-Scale Image Retrieval Systems, authors focused on Dimensionality reduction in large-scale image research plays an important role for their performance in different applications. In this paper, we explore Principal Component Analysis (PCA) as a dimensionality reduction method. For this purpose, first, the Scale Invariant Feature Transform (SIFT) features and Speeded Up Robust Features (SURF) are extracted as image features. Second, the PCA is applied to reduce the dimensions of SIFT and SURF feature descriptors. By comparing multiple sets of experimental data with different image databases, authors have concluded that PCA with a reduction in the range, can effectively reduce the computational cost of image features, and maintain the high retrieval performance as well.

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