

Special Issue Proposal of Current Medical Imaging

On

Internet of Medical Things (IoMT) and Explainable Artificial Intelligence (XAI) for Medical Imaging: Tools, Applications and Future Directions

Overview:

In medical informatics, Machine learning and Deep learning plays an imperative part in complex decision making. With recent technological advancements, Artificial Intelligence techniques are revolutionizing the life sciences with the intention to provide precise healthcare services. Computer vision and image processing is a domain which employs computers in order to extract, process, analyze and understand information from medical images as the human vision system does. Medical image analysis plays an essential role in detection, diagnosis, prognosis and care continuum. The implantation of Machine learning and Deep learning in real world applications is an important research area which possesses capability to offer various societal benefits in the medical domain.

Internet of Medical Things (IoMT) is associated with building applications for healthcare industry. IoMT is the interdisciplinary domain of Internet of things and Healthcare sector. IoMT uses remote and wireless devices to examine the medical imaging via secure communication over internet. According to a recent survey, the overall IoMT market is expected to grow from \$41 billion in 2017 to \$158 billion by 2022. Moreover, the practical applications of IoMT are deployable on the basis of responsible modelling. Recently, ethical and explainable AI is used for responsible modelling of IoMT.

Explainable Artificial Intelligence (XAI) is a recent domain which aims to *unbox* how choices are made by AI systems. This domain investigates the associated models and measures for making decisions and seek solutions in order to explain them explicitly. Many of the machine learning and deep learning techniques cannot demonstrate why and how a decision has been made. Thus, AI system confidence can be hampered by the lack of explainability in these *black-box* models. The XAI becomes more and more crucial for deep learning powered applications, especially for medical and healthcare studies. Although there have been significant advancements in improving the interpretability of DNNs, it is still only heuristically understood, and further reliable explanations need to be developed. The objective of this special session is to collect novel ideas and experiments on how to enhance

explainability of DNNs and solve the black box problem, which is a barrier to make use of these models in real world applications.

The aim of this special issue is to publish the recent research contributions related to explainable machine learning and deep learning algorithms for medical images and health informatics. The primary objective of this special issue is to allow researchers to communicate their high-quality and original ideas by presenting and publishing innovative advances in the field of computer vision, Artificial Intelligence theories/tools, Machine learning or Deep learning methods/techniques and their applications in medical imaging. We welcome contributions that deal with all aspects of the scientific foundations, theories, techniques and applications of machine learning in medical image analysis, including but not limited to:

Topics:

- **Interpretable and explainable machine learning for medical image analysis**
- **Responsible AI for medical image processing**
- **IoMT for medical image processing**
- **Shallow, deep and federated learning for IoMT**
- **Medical image processing and IoMT**
- **Computer Aided Detection (CSDe) or Computer Aided Diagnosis (CADx) systems**
- **Texture analysis of medical images**
- **Explainable AI (XAI) and predictive data analytics for healthcare**
- **DL-techniques for handling Post COVID-19 crisis**
- **IoT-Cloud healthcare big data storage, processing, analysis using ML/DL techniques**
- **Adversarial attacks, threats, and defenses for DL-enabled Healthcare**

Submission Guidelines:

We welcome the novel, unpublished and state-of-the-art research manuscript submissions which do not remain under consideration in any other journal. Submission to this special issue should be made only on the Current Medical Imaging journal's online manuscript submission portal. In the submission process, authors are instructed to select the manuscript type as "Internet of Medical Things (IoMT) and Explainable Artificial Intelligence (XAI) for

Medical Imaging: Tools, Applications and Future Directions". Paper submissions must confirm to the layout and format guidelines in the Current Medical Imaging journal.

Proposed Schedule:

Last date for submission of manuscript:	May 31, 2022
First notification:	Jul. 31, 2022
Submission of revised manuscript:	August 28, 2022
Notification of the re-review:	September 20, 2022
Final notification:	October 10, 2022
Publication:	November 30, 2022

Guest Editors:



**Dr. Ravinder Kaur,
Assistant Professor,
Chandigarh University,
Chandigarh, INDIA - 140413
ravinder.kaur7@yahoo.com; ravinder.e10929@cumail.in**

Dr. Ravinder Kaur is an Assistant Professor of Department of Computer Science and Engineering (CSE) at University Institute of Engineering, Chandigarh University, Punjab, India. She received her PhD from UIET Panjab University, Chandigarh India. She received her Undergraduate Degree with Distinction in 2011, received her Postgraduate Degree (ME in Information Security) with Distinction in 2013 from PEC University of Technology, Chandigarh. She has Published research papers in various renowned International conferences and SCI indexed journals including Biomedical Signal Processing and Control (Elsevier), Computers and Electrical Engineering (Elsevier), Machine Vision and Applications (Springer), Multimedia Tools and Applications and many others. She is also serving as a Reviewer for several reputed SCI journals which includes Computer methods and program in Biomedicine, Elsevier, IEEE Access and Computational and Mathematical Methods in Medicine. She has been awarded with UGC NET and CSIR NET fellowship. She has also been awarded with different research awards for publishing her research work in SCI Journals. She is also a member of renowned organizations including ISTE, IAENG and CSTA.



**Bhisham Sharma,
Associate Professor,
Chitkara University, Himachal Pradesh, India
Email: Bhisham.pec@gmail.com**

Bhisham Sharma received a Ph.D. in Computer Science & Engineering from the PEC University of Technology (Formerly Punjab Engineering College), Chandigarh, India. He is currently working as an Associate Professor in the Department of Computer Science and Engineering, Chitkara University, Himachal Pradesh, India. He is also working as a member of Chitkara University Research & Innovation Network (CURIN). He is having 12 years of teaching and research experience at various reputed Universities in India. He has received the Excellence Award for publishing research papers with the highest H-index is given by Chitkara University in 2020, 2021. He is currently serving as an associate editor for the Computers & Electrical Engineering (Elsevier), International Journal of Communication Systems (Wiley), IET Networks (Wiley), IET Wireless Sensor Systems (Wiley) and Technical Editor of Computer Communication (Elsevier). He is Guest Editor (GE) in Q1 journals CEE Elsevier. He is also a reviewer for more than 30 journals such as Future Generation Computing Systems, IEEE Access, Computer Networks, Frontier of Computer Science, International Journal of Communication Systems, IEEE Transactions on Reliability, and so on. His research interests include Mobile Computing, Wireless Communication, Wireless Sensor Networks, Wireless Mesh Networks, Next Generation Networking, Network Security, Internet of Things, UAV, Medical Image Processing and Edge/Fog Computing in which he has published over 50 research papers in reputed SCI and Scopus indexed journals, international conferences, and book chapters.



Rabie A. Ramadan,
Cairo University, Egypt.
Email: rabie@rabieramadan.org

Rabie A. Ramadan is an associate professor in the fields of Internet of Things (IoT), Mobile Computing, and Computational Intelligence. He got his Ph.D. from Computer Engineering from Southern Methodist University (SMU), Dallas, Texas, USA. He has work experience for more than 27 years. He has industrial experience as an executive manager for a software development company, "Ibda" and "Smartec" companies and worked at Bank of America Securities, Dallas, TX, US, for a three of years. He is leading three research groups in the fields of IoT and Computational Intelligence and an author of 125 journal and conference articles in the field of IoT, Sensor Networks, Mobile Computing, and Computational Intelligence. He also served as a chair, co-chair, or TPC for several conferences (NCSET2020 (Chair), RACS-2015 (Co-chair), NC3 2017 (Co-chair), IEEE WCCI (TPC), and many other conferences as TPC member and steering committee member. Also, he is an editor of WAS SCIENCE NATURE (WASSN) and associate editor of the International Journal of System Dynamics Applications (IJSDA). He has different roles at IEEE on industrial informatics, IEEE ACCESS, IEEE's Transactions on Parallel and Distributed Systems Journal, IEEE Transactions on Neural Networks and Learning Systems, International Journal of Memetic Computing, and many other Journals. He was the leading editor of special issue at International Journal of Robotics and Automation (actapress), Memetic Computing (Springer), International Journal of Intelligent Engineering Informatics (inderscience), and Complex Adaptive Systems Modeling (Springer), and International Journal of System Dynamics Applications (IGI). He was able to secure external and internal funds for his research as Principal Investigator (PI) and Co-Investigator (Co-PI) from different Funding agencies, Universities, and Industry with a total amount of (\$27,742,859). These agencies include Ministry of Education, Saudi Arabia; Framework Programme 7 (EU) (FP7), ITEA 3; Intel company; Vodafone telecommunication Company, Egypt National Telecom Regularity Authority, Egypt.

List of Contributors for the Special Issue

1. **Dr. Sherali Zeadally**
College of Communication and Information
University of Kentucky
szeadally@uky.edu
2. **Dr Xiaochun Cheng**
Department of Computer Science
Middlesex University, London
xiaochun.cheng@gmail.com
3. **Dr. Gwanggil Jeon**
Incheon National University
gjeon@inu.ac.kr
4. **Dr. Mohammed Atiquzzaman**
School of Computer Science,
University of Oklahoma, Norman
atiq@ou.edu
5. **Dr. Bassam AboShosha**
Alshrouk Academy, Egypt
Aboshosha@sha.edu.eg
6. **Professor Hani Hagra**
School of Computer Science and Electronic Engineering (CSEE)
University of Essex
hani@essex.ac.uk
7. **Dr. Salah Abdulmajeed**
Alzhar University, Cairo, Egypt
sabdeltameid@taibahu.edu.sa
8. **Dr. Sahin Uyaver**
Turkish-German University, Turkey
sahin.uyaver@gmail.com
9. **Harisu Abdullahi Shehu**
Victoria University of Wellington, New Zealand
harisu.shehu@ecs.vuw.ac.nz
10. **Dr. Ibrahim Furkan Ince**
Dept. of Electronics Eng. & Digital Game Design, Kyungsung & Nişantaşı Univ.,
Korea
furkanince@gmail.com
11. **Dr. Haidar Elsharief**
College of Computer Science and Engineering, Hail University, Saudi Arabia
md.haidar@uoh.edu.sa