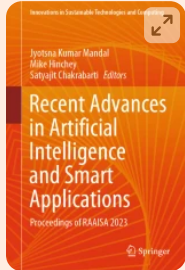


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# Recent Advances in Artificial Intelligence and Smart Applications

Proceedings of RAAISA 2023

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## Overview

Editors: [Jyotsna Kumar Mandal](#), [Mike Hinchey](#), [Satyajit Chakrabarti](#)

- Includes recent research presented at RAAISA 2023, held in Kolkata, India
- Presents research works in the field of artificial intelligence and smart applications
- Serves as a reference for researchers and practitioners in academia and industry

 Part of the book series: [Innovations in Sustainable Technologies and Computing \(ISTC\)](#)

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## About this book

The book includes original unpublished contributions presented in First International Conference on Recent Advances in Artificial Intelligence and Smart Applications (RAAISA 2023), organized by Department of CSE, University of Engineering and Management, Kolkata, India during 14 – 15 December 2023. The topics covered are progression of artificial intelligence techniques like smart agent-based systems, human-computer interaction technologies, reinforcement learning, sentiment analysis, recurrent neural networks and its applications, genetic algorithm, and neural networks.

# Keywords

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[Human-Computer Interaction Technologies](#)

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Dr. Jyotsna Kumar Mandal(F232495), M. Tech. in Computer Science from University of Calcutta in 1987, awarded Ph. D. (Engineering) in Computer Science and Engineering by Jadavpur University in 2000. Working as Professor of Computer Science & Engineering, University of Kalyani. Former Dean, Faculty of Engineering, Technology & Management, KU for two consecutive terms during 2008–2012. Director, IQAC and Chairman CIRM Kalyani University. Served as Professor Computer Applications, Kalyani Government Engineering College for two years. He was Associate Professor Computer Science for eight years at North Bengal University and Assistant Professor Computer Science North Bengal University for seven years. He also served as lecturer at NERIST, Itanagar for one year. 34 years of teaching and research experience in Coding theory, Data and Network Security and authentication; Remote Sensing & GIS based Applications, Data Compression, Error Correction, Visual Cryptography and Steganography. Awarded 28 Ph. D. Degrees, 4 submitted and 8 are pursuing. Supervised 03 M. Phil, more than 80 M. Tech and more than 130 M.C.A. Dissertations. Guest Editor of MST Journal (SCI indexed) of Springer. Published more than 450 research articles out of which 190 articles in International Journals. Published 12 books from Springer, LAP Germany, IGI Global etc. Recently he has published a text book on Reversible Steganography and Authentication via Transform Encoding from Springer. He has Organized 55 International Conferences and Corresponding Editors of edited volumes and conference publications of Springer, IEEE and Elsevier etc. and edited 55 volumes as volume editor. He has completed five Research Project from which grants received from AICTE and Govt. of West Bengal. He served as Secretary, IETE Kolkata Center, Chairman CSI Kolkata Chapter and CSI Siliguri Chapter. Peer Team member of NAAC Accreditation Process. Expert member of AICTE EVC. Conduct Academic Audit of Various University and Institutes. Higher Education Department, Government of West Bengal, India conferred him “Siksha Ratna” award for outstanding performance in education in 2018.

Professor Mike Hinchey is former President of IFIP, the International Federation for Information Processing founded by UNESCO in 1960 and is Emeritus Director of Lero—the Science Foundation Ireland Centre for Software, and Professor of Software Engineering at University of Limerick, Ireland. Prior to joining Lero, Professor Hinchey was the Director of the NASA Software Engineering Laboratory. The holder of 30 US patents, in 2009 he was awarded NASA’s Kerley Award as Innovator of the Year and is recognized in the NASA Inventors Hall of Fame. Professor Hinchey holds a B.Sc. in Computer Systems from University of Limerick, an M.Sc. in Computation from University of Oxford and a PhD in Computer Science from University of Cambridge. Professor Hinchey is a Chartered Engineer, Chartered Engineering Professional, Chartered Mathematician and Chartered Information Technology Professional, as well as a Fellow of the IET, British Computer Society, Engineers Australia, Engineers Ireland, and Irish Computer Society, of which he is also President. In 2018 he became an Honorary Fellow of the Computer Society of India and was the SEARCC Global ICT Professional of the Year 2018.

He was Chair of IEEE UK & Ireland Section for 2018–2019. He is the author/editor of more than 20 books and over 200 papers on various aspects of computing, software engineering, and autonomous systems. He is Editor-in-Chief of Innovations in Systems and Software Engineering: a NASA Journal (Springer) and Journal of the Brazilian Computer Society (Springer).

Satyajit Chakrabarti is Pro-Vice Chancellor, University of Engineering & Management, Kolkata and Jaipur Campus, India, and Director of the Institute of Engineering & Management, IEM. As the Director of one of the most reputed organizations in Engineering & Management in Eastern India, he launched a PGDM Programme to run AICTE approved Management courses, Toppers Academy to train students for certificate courses and Software Development in the field of ERP solutions. Dr. Chakrabarti was Project Manager in TELUS, Vancouver, Canada from February 2006 to September 2009, where he was intensively involved in planning, execution, monitoring, communicating with stakeholders, negotiating with vendors and cross-functional teams and motivating

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# Chapter 18

## An IoT-Based Smart Tracking Application Integrated with Global Positioning System (GPS)



Ritika Chatterjee , Dola Sinha , Sovan Bhattacharya ,  
Laxmidhar Biswal, Bappaditya Mondal , and Chandan Bandyopadhyay 

**Abstract** This study presents the development of a wireless system designed to accurately find objects and visually display their precise positions on a map. The instrument is specifically created to serve as a versatile tracking mechanism that facilitates accurate placement through the utilization of coordinates, namely longitude and latitude. The central processing unit, as well as the interface unit for facilitating communication with both hardware and software components, is a NodeMCU microcontroller equipped with a high-end Wi-Fi module. The NEO-6M GPS module is employed for the purpose of transmitting geographical coordinates and establishing a connection with satellites. The tracking system has been implemented using two

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