

## Call for Book Chapters



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### Emerging trends and role of Fog, Edge and Pervasive Computing in Intelligent IoT driven applications

*All accepted chapters will be available online on IEEE Xplore and Wiley Online Library.*

*All chapters are covered by Scopus.*

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### Table of Content

#### **Chapter 1: Role of Intelligent IoT applications in Fog/Edge/Pervasive Paradigm: Issues, Challenges and future opportunities.**

**Abstract:** This chapter covers various problems and challenges that have been faced by the practitioners in last few years. A brief history with regard to the field of Edge/Fog and Pervasive computing along with basic introduction to Intelligent Computing will be provided which will serve as inspiration and a rich source of ideas to researchers. In addition to this Smart computing models, approaches and analysis would be discussed which will enable the researchers to apply Edge/Fog and Pervasive computing in solving real world problems. Due to usage of various diagnostic and vision driven tools explored new opportunities will be discussed.

1.1 Why Pervasive/Edge/Fog Computing?

1.2 Concept of Intelligent IoT applications in Smart Computing Era.

1.3 Components of Edge and Fog driven Algorithm

1.4 Working of Edge and Fog driven Algorithm

1.5 Future opportunistic Fog/Edge Computational Models

1.6 Challenges of Fog/Edge/Pervasive Computing for Intelligent IoT applications

1.7 Applications of Cloud based Computing for Smart Devices

## **Chapter 2: Machine Learning frameworks and algorithms for fog/edge/pervasive computing**

**Abstract:** This chapter will be concerned with the algorithm and frameworks adopted for fog computing. This chapter will also cover various kind of deep learning algorithms, techniques and recommendation systems employed for scaling of edge and fog computing.

2.1 Overview of Machine Learning Frameworks for Fog/Edge/Pervasive Computing.

2.2 Supervised, Unsupervised and Reinforcement model for Edge/Fog/Pervasive Computing.

2.3 Mathematical learning models and statistical analysis using Intelligent Computing.

2.4 Pros and Cons of ML algorithms for Fog/Edge/Pervasive computing.

2.5 Hybrid ML model for smart IoT applications.

2.6 Possible applications in Fog Era using machine learning.

## **Chapter 3: Edge/fog/pervasive computing-based storage system for intelligent IoT applications**

**Abstract:** This chapter will be dealt with introduction of various storage systems and probabilistic methods and related concepts used for IoT applications.

3.1 Interactive and Efficient Edge based storage system for smart applications.

3.2 Cost Effective and Reliable Fog driven storage approaches for intelligent IoT applications

3.3 Edge Server/Gateways and Cloud Apps for monitoring IoT applications.

3.4 Data Uploading and storage at Google/Amazon providers with Fog nodes.

3.5 Energy provision and storage for pervasive computing.

## **Chapter 4: Literature review: Analyzing the intelligent computing technologies and techniques used in pervasive computing systems from past to prepare for future**

**Abstract:** This chapter will present a literature review that will analyze the work from past to prepare for future in detail with respect to pervasive computing.

4.1 Fuzzy set theory driven applications for pervasive computing.

- 4.2 Location based services and technologies for pervasive computing.
- 4.3 Wireless network design and user movement prediction.
- 4.4 Soft computing techniques from past to future for smart computing.
- 4.5 Ambient intelligent techniques data collection from past to future.
- 4.6 Survey on Semantic web techniques and their impact in ubiquitous computing

## **Chapter 5: Deployment of fog/edge assistive services for vision driven applications**

**Abstract:** This chapter will cover various fog/edge assistive services and related concepts used in field of vision driven IoT applications. The various image driven algorithms, methodologies and architectures used for deployment of fog and edge driven services can be discussed in this chapter.

- 5.1 Fog and Edge architecture for health care and Biomedical domain.
- 5.2 Machine vision algorithms for fog and edge assistive services.
- 5.3 Image processing-based ensemble services for fog and edge computing toolbox.
- 5.4 Fog computing-based face identification system.
- 5.5 Video processing system for pervasive computing application.
- 5.6 Image processing algorithms for ubiquitous or pervasive computing.

## **Chapter 6: Game and probabilistic based method for edge/fog resource scheduling, management and allocation.**

**Abstract:** This chapter will be dealt with emerging techniques like Game based learning and Bayesian probabilistic methods used for resource scheduling and task management allocation.

- 6.1 Resource management in Edge/Fog computing using game theory concepts.
- 6.2 Bayesian Network driven resource management schemes for edge/fog computing.
- 6.3 Resource allocation algorithms for intelligent IoT applications.
- 6.4 Latency based and energy efficient scheduling in Fog/Edge computing.
- 6.5 Game driven resource sharing model in pervasive/fog/edge computing
- 6.6 Modeling and simulation of resource management techniques in fog and edge computing.

## **Chapter 7: Security and privacy issues in fog/edge/pervasive computing system.**

**Abstract:** This chapter will be concerned with security and privacy handling issues occurred in pervasive and edge boundary system for recognizing voice, sound using intelligent IoT mining techniques.

- 7.1 Data security and privacy in fog and edge computing.
- 7.2 Data integrity and resource availability using pervasive computing applications.
- 7.3 Designing future security related solutions for developing fog systems.
- 7.4 Trust and reputation issues in fog and edge computing.
- 7.5 Security architecture for fog-cloud and pervasive computing architectures.
- 7.6 Key management in fog computing
- 7.7 Intrusion detection in fog computing
- 7.8 Secure outsourcing computation of fog devices
- 7.9 Cyber-physical security of fog device
- 7.10 Security model in fog applications

## **Chapter 8: Current ongoing research in Resource provisioning and bandwidth allocation for edge/fog/pervasive mobile applications.**

**Abstract:** This chapter will highlight the current ongoing research addressed bandwidth allocation and resource provisioning system for Fog/Edge and IoT applications.

- 8.1 Resource provisioning in Edge computing for IoT applications.
- 8.2 Dynamic resource allocation for load balancing in Fog Computing.
- 8.3 Resource allocation for mobile applications in pervasive computing.
- 8.4 Workload engineering in fog, edge and pervasive computing.
- 8.5 Load balancing and utilization in fog servers for smart IoT applications.
- 8.6 Utility aware and bandwidth utilization for fog, edge and pervasive computing.

## **Chapter 9: Optimization techniques for intelligent IoT applications.**

This chapter will discuss the distinguished optimization techniques used for intelligent IoT applications. The chapter will elaborate role of optimization techniques like Cuckoo Search, Glow Worm, WASP and Fish Swarm along with their variants, algorithms, Mathematical proof and applicability in real world IoT applications.

Cuckoo Search, Fish Swarm, Glow worm and WASP are highly effective Swarm Intelligence techniques to solve combinatorial problems and is applied by researchers in various issues and results are bound exceeding in optimizations.

## Cuckoo Search

9.1 Introduction to Natural Cuckoo Behavior

9.2 Artificial Cuckoo Search

9.3 Cuckoo Search Algorithm

9.4 Mathematical Proof of Cuckoo Search

9.5 Cuckoo Search Variants

9.5.1 Discrete Cuckoo Search

9.5.2 Binary Cuckoo Search

9.5.3 Chaotic Cuckoo Search

9.5.4 Parallel Cuckoo Search

9.5.5 Gaussian Cuckoo Search

9.6 Application of Cuckoo Search in Real-World Applications

## Glow Worm Algorithm

9.7 Introduction to Glow Worm

9.8 Glow-worm Swarm Optimization (GSO) Algorithm

9.9 Mathematical Proof of GSO Algorithm

## WASP Swarm Optimization

9.10 Introduction to WASP Swarm

9.11 Wasp Swarm Algorithm

9.12 Mathematical Proof of WASP Swarm Algorithm

9.13 Hybrid WASPS

9.14 Fish Swarm Optimization

9.15 Fruit Fly Optimization Algorithm

9.16 Termite Hill Algorithm

9.17 Cockroach Swarm Optimization

9.18 Bumblebees Algorithm

9.19 Shuffled Frog Leaping Algorithm

9.20 Dolphin Echolocation

9.21 Biogeography based Optimization

9.22 Paddy Field Algorithm

## **Chapter 10: Applications on Smart Farming, Factory and Marketing automation, Econometrics, Information fusion and medical diagnosis for Fog/Edge/Pervasive computing.**

This chapter will discuss the applications related to Medical Imaging, business sector and agricultural usages in Fog/Edge/Pervasive computing driven applications. The prime objective of this chapter will be to discuss in-depth coverage of Fog, Edge driven applications in Communication Networks, Robotics, Data Mining, Big Data Analytics, Artificial Intelligence and Internet of Things (IoT).

10.1 Smart Farming applications in Fog/Edge/Pervasive Architecture.

10.2 Factory and Marketing Automation.

10.3 Medical Diagnosis and health care automation.

10.4 Econometrics and related Smart IoT applications.

10.5 Information Fusion.

10.6 Fog, Edge and Pervasive computing Applications for any IoT device.

**Authors may choose any of the above chapters or they can also propose related chapter.**

**For any queries regarding submission of FULL chapters, please contact via Email: [aditya.khamparia88@gmail.com](mailto:aditya.khamparia88@gmail.com), [drdeepakgupta.cse@gmail.com](mailto:drdeepakgupta.cse@gmail.com)**

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### **Tentative Timeline:**

Deadline for Chapter Proposal Submission: 15<sup>th</sup> September 2019.

Acceptance/Rejection Notification: 30<sup>th</sup> September 2019.

Deadline for Full Chapter submission: 30<sup>th</sup> November 2019.

Acceptance/Rejection Notification: 30<sup>th</sup> December 2019.

Tentative Publication Due: Feb 2020.