

पेटेंट कार्यालय  
शासकीय जर्नल

**OFFICIAL JOURNAL  
OF  
THE PATENT OFFICE**

---

---

निर्गमन सं. 36/2024  
ISSUE NO. 36/2024

शुक्रवार  
FRIDAY

दिनांक: 06/09/2024  
DATE: 06/09/2024

---

---

पेटेंट कार्यालय का एक प्रकाशन  
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202441064533 A

(19) INDIA

(22) Date of filing of Application :27/08/2024

(43) Publication Date : 06/09/2024

(54) Title of the invention : METHOD AND SYSTEM FOR PRIVACY-PRESERVING FEDERATED LEARNING IN DECENTRALIZED NETWORKS USING BLOCKCHAIN AND EDGE COMPUTING

(51) International classification :G06N3/08, H04L67/12, H04L9/12, H04L9/32, G16Y30/00, G06F8/65, G06F21/57, G06F21/62

(86) International Application No :NA  
 Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA  
 Filing Date :NA

(62) Divisional to Application Number :NA  
 Filing Date :NA

(71)Name of Applicant :  
**1)Major Dr. V. A. Narayana**  
 Address of Applicant :Professor, Computer Science Engineering, CMR College of Engineering & Technology, Kandlakoya, Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----  
**2)Mrs. Naga Sailaja Manyala**  
**Name of Applicant : NA**  
**Address of Applicant : NA**

(72)Name of Inventor :  
**1)Dr. Venkataiah Vadala**  
 Address of Applicant :Associate Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya , Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----  
**2)Dr.G. Ravi Kumar**  
 Address of Applicant :Associate Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya, Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----  
**3)Mr. J. Ranjith**  
 Address of Applicant :Assistant Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya , Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----  
**4)Mrs. Krishnaveni Erukonda**  
 Address of Applicant :Assistant Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya , Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----  
**5)Mr. Chinna Maddileti Berageri Kuruva**  
 Address of Applicant :Assistant Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya, Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----

(57) Abstract :  
 METHOD AND SYSTEM FOR PRIVACY-PRESERVING FEDERATED LEARNING IN DECENTRALIZED NETWORKS USING BLOCKCHAIN AND EDGE COMPUTING ABSTRACT The invention relates to a system 100 for privacy-preserving federated learning in decentralized networks. The system comprises a plurality of edge devices 110, each capable of locally storing and processing data, training a machine learning model on this data, and sharing model updates with other edge devices without disclosing raw data. These edge devices are integrated with a blockchain network 112 that ensures secure, immutable recording of model updates and facilitates consensus for model aggregation. Each edge device includes an adaptive learning algorithm module 114 to dynamically adjust learning rates and parameters, ensuring model robustness despite non-iid data. Additionally, a privacy-preserving protocol 116 within each device applies differential privacy and homomorphic encryption to safeguard individual data points and secure model updates. A communication module 118 enables low-latency, peer-to-peer connections and optimizes communication efficiency through model compression. This system enhances privacy and collaboration in decentralized federated learning environments.

No. of Pages : 20 No. of Claims : 10