(12) PATENT APPLICATION PUBLICATION   (21) Application No.202441077952 A

(19) INDIA

(22) Date of filing of Application :15/10/2024   (43) Publication Date : 25/10/2024

(54) Title of the invention : HYBRID EXPLAINABLE AI FRAMEWORK FOR TRANSPARENT, ADAPTIVE DECISION-MAKING IN MULTI-AGENT AUTONOMOUS SYSTEMS

(71)Name of Applicant :
 1)CMR Institute of Technology
   Address of Applicant :KANDLAKOYA, MEDCHAL ROAD, HYDERABAD, TELANGANA, INDIA, 501401. Hyderabad ----------- -----------
 2)CMR COLLEGE OF ENGINEERING & TECHNOLOGY
 3)CMR TECHNICAL CAMPUS
Name of Applicant : NA
Address of Applicant : NA
(72)Name of Inventor :
 1)Mr M.Satish
Address of Applicant :Assistant Professor, Computer Science and Engineering(AI&ML), CMR Institute of Technology, Kandlakoya, Medchal, Hyderabad, Telangana, India. 501401., Hyderabad ----------- -----------
 2)Mrs P.Sujani
Address of Applicant :Assistant Professor, Computer Science and Engineering(AI&ML), CMR Institute of Technology, Kandlakoya, Medchal, Hyderabad, Telangana, India. 501401., Hyderabad ----------- -----------
 3)Mrs Ch Swapna
Address of Applicant :Assistant Professor, Computer Science and Engineering(AI&ML), CMR Institute of Technology, Kandlakoya, Medchal, Hyderabad, Telangana, India. 501401., Hyderabad ----------- -----------
 4)Mr. Narasimha Dontham
Address of Applicant :Assistant Professor, Computer Science and Engineering , CMR College of Engineering & Technology Hyderabad ----------- -----------
 5)Mr. Chinna Maddileti Berageri Kuruva
Address of Applicant :Assistant Professor, Computer Science and Engineering IT, CMR College of Engineering & Technology Hyderabad ----------- -----------
 6)Mrs. Sangeetha S
Address of Applicant :Assistant Professor, Computer Science and Engineering, CMR College of Engineering & Technology Hyderabad ----------- -----------
 7)Md Shareef
Address of Applicant :Asst. Prof., Computer Science and Engineering (AI & ML), CMR Technical Campus Hyderabad ----------- -----------
 8)Bushra Tarannum
Address of Applicant :Asst. Prof., Computer Science and Engineering (AI & ML), CMR Technical Campus Hyderabad ----------- -----------

(57) Abstract :
HYBRID EXPLAINABLE AI FRAMEWORK FOR TRANSPARENT, ADAPTIVE DECISION-MAKING IN MULTI-AGENT AUTONOMOUS SYSTEMS ABSTRACT A hybrid explainable AI system (100) for transparent and adaptive decision-making in multi-agent autonomous systems is disclosed. The system (100) comprises a multi-agent control module (110) that manages interactions between autonomous agents, an adaptive decision-making engine (112) that adjusts decisions in real-time based on environmental feedback, and an explainable AI module (114) that generates human-understandable explanations. The hybrid model combines rule-based reasoning with deep learning techniques to provide interpretable insights. A transparency interface (116) delivers real-time graphical and textual explanations with confidence scores, enabling operators to understand the rationale behind each decision. The system (100) further includes a communication network (118) that facilitates real-time data exchange between components. The hybrid explainable AI system (100) enhances collaboration between autonomous agents and human users through transparent, interpretable, and adaptive decision-making processes, improving operational efficiency and user trust in complex, dynamic environments. FIG. 1

No. of Pages : 19 No. of Claims : 10