

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.202441064530 A

(19) INDIA

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

(43) Publication Date : 06/09/2024

(54) Title of the invention : SYSTEM AND METHOD FOR REAL-TIME QUANTUM ERROR CORRECTION WITH ADAPTIVE SYNDROME EXTRACTION

| | |
|---|------------|
| (51) International classification | :G06N10/70 |
| (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. Kamala Mekala

Name of Applicant : NA

Address of Applicant : NA

(72)Name of Inventor :

1)Dr. Siva Skandha Sanagala

Address of Applicant :Associate Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya , Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----

2)Mr. Raja Kishore Babu Chikkala

Address of Applicant :Associate Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya , Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----

3)Dr. Kirubakaran Sakthivel

Address of Applicant :Professor, Computer Science and Engineering CMR College of Engineering & Technology, Kandlakoya , Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----

4)Dr. Upender Talluri

Address of Applicant :Assistant Professor, Computer Science and Engineering, CMR College of Engineering & Technology, Kandlakoya, Medchal, Hyderabad, Telangana, India. 501401 Hyderabad -----

(57) Abstract :

SYSTEM AND METHOD FOR REAL-TIME QUANTUM ERROR CORRECTION WITH ADAPTIVE SYNDROME EXTRACTION ABSTRACT This invention provides a system (100) for real-time quantum error correction with adaptive syndrome extraction. The system includes a Quantum Processing Unit (QPU) (102) configured for quantum computations with multiple qubits, and a Classical Control Unit (CCU) (104) that manages and monitors quantum operations, implementing error correction protocols. An Adaptive Syndrome Extraction Module (106) comprises a Syndrome Measurement Circuit (106a) for non-destructive syndrome measurement and Adaptive Control Logic (106b) to dynamically adjust measurement frequency and methods based on error rates. The Error Correction Module (108) includes a Decoding Algorithm (108a) for interpreting syndromes and a Feedback Loop (108b) to apply corrections in real-time. Additionally, a Noise Mitigation Interface (110) dynamically applies noise reduction techniques, enhancing robustness, and a Data Logging Unit (112) records relevant data for post-processing and optimization of error correction protocols. FIG. 1

No. of Pages : 26 No. of Claims : 10