

पेटेंट कार्यालय
शासकीय जर्नल

**OFFICIAL JOURNAL
OF
THE PATENT OFFICE**

निर्गमन सं. 42/2025
ISSUE NO. 42/2025

शुक्रवार
FRIDAY

दिनांक: 17/10/2025
DATE: 17/10/2025

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(54) Title of the invention : Method and System for Quantum Computing using Superconducting Qubits

(51) International classification	:G06N0010000000, G06N0010400000, G06N0010600000, H10N0060120000, G06N0010200000	(71)Name of Applicant : 1)Dr. V. P. Geetha Vani, Address of Applicant :Dr. V. P. Geetha Vani, Associate Professor in Physics, Dr. K. V. Subba Reddy Institute of Technology, Kurnool Mobile:9676201527, drbalimidi@gmail.com Andhra Pradesh India 2)Mr. Sathish Krishna Anumula, 3)Dr.Y.Saritha Kumari, 4)Dr.C.C.Sangeetha, 5)Dr. R. Nithya, 6)Dr. Samuel Talari,
(31) Priority Document No	:NA	(72)Name of Inventor : 1)Dr. V. P. Geetha Vani, 2)Mr. Sathish Krishna Anumula, 3)Dr.Y.Saritha Kumari, 4)Dr.C.C.Sangeetha, 5)Dr. R. Nithya, 6)Dr. Samuel Talari,
(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:	
Filing Date	:01/01/1900	
(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	

(57) Abstract :

Abstract of the Invention The Method and System for Quantum Computing using Superconducting Qubits (QC- SQ) represents a pioneering advancement in quantum processor technology, meticulously crafted to support Indias National Quantum Mission and its ambition to develop 1,000- qubit processors by 2030. Addressing critical challenges in quantum computingsuch as short coherence times, high gate error rates, and scalability limitationsQC-SQ delivers coherence times exceeding 200 microseconds, gate fidelities above 99.9 percent, and scal- ability to over 100 qubits. This system introduces a paradigm shift in quantum hardware design, supporting Indias goal of becoming a global leader in quantum innovation. The Method and System for Quantum Computing using Superconducting Qubits (QC-SQ) achieves coherence times greater than 200 microseconds, gate fidelities greater than 99.9 percent, and scalability to more than 100 qubits. Key features include: • Transmon qubit arrays with tunable couplers to minimize crosstalk, where the energy model includes a charging component based on the square of the difference between the number operator and gate charge, adjusted by a Josephson energy term varying with the cosine of the phase, and interactions tuned via a coupling strength proportional to the product of Z Pauli operators. • Neural network-based pulse shaping for adaptive gate optimization, enhancing con- trol precision. • Surface code error correction with real-time decoding, reducing logical errors by 50 percent, using stabilizers formed by the product of X operators and Z operators, decoded with minimum-weight perfect matching. • Hybrid quantum-classical interfaces for algorithms like VQE, facilitating integrated computation. • Modular cryogenic platform for scalability, supporting expandable quantum archi- tectures. Its India-centric design and ML-adaptive control distinguish it from prior art, sup- porting local quantum initiatives by fostering indigenous technological development.

No. of Pages : 12 No. of Claims : 6