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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA 1

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EVENTS

- In a major step toward bridging academics and high-tech industry, Jawaharlal Nehru Technological University Kakinada (JNTUK) and Efftronics Systems Private Limited entered into a Memorandum of Understanding (MoU) and formally launched an industry-sponsored M.Tech Programme in the Internet of Things (IoT) on 23rd July 2026 at Hyatt Place, Vijayawada. The ceremony was graced by Chief Guest Prof. CSRK Prasad, Hon'ble Vice Chancellor of JNTUK, alongside Dr. R. Srinivasa Rao, Registrar of JNTUK, Dr. K. Padma Raju, Principal of UCEK, JNTUK, and Sri Rama Krishna Dasari, Managing Director of Efftronics Systems Private Limited, along with university officials and industry representatives. Sponsored by Efftronics Systems Private Limited under the theme “Step towards building future digital workforce”, this collaborative postgraduate programme aims to cultivate specialized engineering talent equipped with cutting-edge industry competencies in IoT architecture, embedded systems, and smart automation.
- Dr. R. Srinivasa Rao, Senior Professor, EEE, UCEK, JNTUK, Dr. Narra Sumathi, Professor, EEE, UCEK, JNTUK and Dr. Venkata Reddy Kota, Professor & Head, EEE, UCEK, JNTUK, has successfully completed consultancy work for M/s. Sriva Live Line Services, Hyderabad, on 17th April 2026 and 18th April 2026. This involved The Testing of Heavy duty 2 rail hook ladder, Light duty 2 rail hook ladder, Cradle poles, Roller link stick, Sectional hot sticks, Strain carrier poles, Telescopic hot sticks.
- The Department of Electrical & Electronics Engineering, JNTUK has introduced the Centre for Excellence for Electric Mobility to promote hands-on learning, innovation, and research in the rapidly growing field of electric mobility. The centre is equipped with advanced facilities including a Li-ion battery pack making setup, battery grading and cell testing machines, battery pack testing equipment, and a semi-automated spot welding machine. The centre offers students practical exposure to battery pack development and testing, strengthening students industry-oriented skills
- The EEE department, UCEK, JNTUK, procured new laboratory equipment for the High Voltage Laboratory in the year 2026 to strengthen experimental facilities for students and faculty. The equipment procured for the laboratory includes a Fluke 15B Digital Multimeter & Fluke 301C Clamp Meter, Goniometer (High Voltage Laboratory) These new additions support UG and PG students in carrying out regular laboratory coursework and project research.

FDPS ORGANIZED

- A One Week Offline Faculty Development Programme (FDP) on “Emerging Trends and Challenges in Electric Vehicle Technologies” was organized from 29th June 2026 to 3rd July 2026. The FDP was coordinated by Dr. K. Ravindra, Professor of EEE, UCEK, JNTUK & Director of IQAC and capacity building, and Dr. G. Syamnaresh, Associate Professor of EEE, Sagi Rama Krishnam Raju Engineering College (A), Bhimavaram. The Faculty development program focused on the merging trends, technological developments, and challenges in Electric Vehicle technologies. This FDP was sponsored by the Directorate of IQAC & Capacity Building, JNTUK.
- A One Week Offline Faculty Development Programme (FDP) on “Sustainable Power Electronics for Next-Generation Integrated Electric Mobility and Smart Grids”. The FDP was organized from 6th July 2026 to 10th July 2026. The one-week FDP was coordinated by Dr. T. Murali Mohan, Professor of EEE, UCEK, JNTUK and Dr. RVD Ramarao, Professor & Head, Department of EEE, Vishnu Institute of Technology, Bhimavaram. The Faculty development Program focused on sustainable power electronics, electric mobility, and smart grid technologies. The programme was sponsored by the Directorate of IQAC & Capacity Building, JNTUK.
- A One Week Offline Faculty Development Programme (FDP) on “Application of Intelligent Controllers to Electrical Systems” was organized from 29th June 2026 to 3rd July 2026. The FDP was coordinated by Dr. R. Srinivasa Rao, Senior Professor of EEE, UCEK, JNTUK & Registrar, JNTUK and Dr. B. Dasu, Professor of EEE, Seshadri Rao Gudlavalleru Engineering College (A), Gudlavalleru. The FDP focused on the application of intelligent controllers in modern electrical systems. The programme was sponsored by the Directorate of IQAC & Capacity Building, JNTUK

FDPS ATTENDED

- Dr. Shanmukha Nagaraju Vontedu, Assistant Professors(C), Smt. J.Jyothsna, Assistant Professors(C), Ms K.Joshi Rani, Assistant Professor(c), of the Department of EEE, UCEK, has participated in One Week Short Term Course (STC) on "Recent Trends in Power and Energy Systems (RTPES-2026)" held from 13th July 2026 to 17th July 2026 in hybrid mode. The programme was organized by the Department of Electrical Engineering, National Institute of Technology Delhi, An autonomous Institute under the aegis of the Ministry of Education, Government of India.
- Dr. B. Ajay Babu, Assistant Professors(C), Smt. J.Jyothsna, Assistant Professors(C), Ms K.Joshi Rani, Assistant Professor(c), of the Department of EEE, UCEK, had participated in the one week Faculty Development Program (FDP) on "Digital Engineering Of Electrical Machines And Electromagnetic Devices Using ANSYS" held from 6th July 2026 to 10th July 2026. The program was organized by Department of Electrical and Computer Engineering, Bharati Vidyapeeth (Deemed to be University), College of Engineering in Association with ARK Infousolutions Pvt. Ltd. and ANSYS(Part of Synopsys).
- Faculty members of EEE department, UCEK, have successfully completed an 18hour Online Faculty Development program. The FDP "Autodesk fusion electronic " was Organized by Autodesk authorized training centre. The FDP was conducted from 1st July 2026.
- Faculty members of EEE department, UCEK, has participated in International Symposium on Recent Trends in Technical Education During Oak Jubilee Celebrations. As part of its milestone Oak Jubilee Year (2025–26) commemorating 80 years of excellence in education, the University College of Engineering Kakinada (UCEK), Jawaharlal Nehru Technological University Kakinada (JNTUK), Andhra Pradesh, organized a two-day International Symposium on "Recent Trends in Technical Education" from 14th July 2026 to 15th July 2026.

ACHIVEMENTS

- Mr. Raj Gopal Sai Duriseti, a final-year B.Tech student of the Department of Electrical and Electronics Engineering (EEE), UCEK, JNTUK, has been provisionally selected for the Industry-Ready Professional Training (IRPT 2026) in VLSI Custom Layout Design conducted by VEDA IIT. The selection was finalized based on his performance in the written test and technical interview conducted by VEDA IIT, a unit of the VEDA Educational Society, under the framework of the VEDA IIT – JNTUK Memorandum of Understanding (MoU). The specialized training program encompasses critical semiconductor domain - Memory Layout. As part of this program, the student undergoes full-time industry training during IV Year Semester-I (with training costs sponsored by the VEDA Educational Society), followed by an industry internship during IV Year Semester-II at VEDA IIT or a consortium company, paving the way for direct core employment upon graduation.

PATENT

- Dr. Venkata Reddy Kota, Professor & Head, EEE, UCEK, Kasa Chaithra Lahari, Upadrasta V S Satya Sai Srivatsa and Padala Mohan Vamsi secured a design patent on "A Regenerative Rowing Machine". Patent Application No. 478498-001, The patent was filed on 30th October 2025 and was granted on 31st July 2026.
- Ms. K. Joshi Rani, Assistant Professor (C), EEE, UCEK, secured a design patent on "Microcontroller-Based Control Unit". Patent Application No. 499610-001, The patent was filed on 26th April 2026 and was granted on 02th July 2026.

QUANTUM COMPUTING

“What if a computer could explore millions of possibilities in ways that today's machines cannot? This is the promise of quantum computing—a new form of computation based on the fascinating laws of quantum mechanics.”

INTRODUCTION

Quantum computing is a rapidly evolving field of computer science that uses the principles of quantum mechanics to solve complex problems exponentially faster than traditional supercomputers.

. While a classical computer processes information using bits (which can only be a 0 or a 1), a quantum computer uses qubits (quantum bits) to process massive amounts of data in ways previously thought impossible.

Now let us try to understand “qubits”



WHAT IS A QUBIT

Unlike classical computers, which use bits that can represent either 0 or 1, quantum computers use quantum bits, or qubits. A qubit is the fundamental unit of quantum information and can exist in a combination of the states 0 and 1, a property known as superposition.

When a qubit is measured, it produces either 0 or 1. The probability of obtaining each result depends on the quantum state of the qubit. This unique behavior allows quantum computers to process information in fundamentally different ways from classical computers.

Simple representation

where α and β describe the probability amplitudes of obtaining 0 or 1 when the qubit is measured. Feels difficult right.

Let us try to understand it in a easy way.

Imagine a coin.

A normal bit is like a coin lying on a table

Heads $\rightarrow$ 0

or

Tails $\rightarrow$ 1

A qubit is often compared to a spinning coin.

While spinning, you can't simply say it is heads or tails. It is described by a quantum state containing both possibilities.

When you measure it, however, you get one definite result: either “0 or 1”

Before measurement:

After measurement:

(0) Or (1)

I hope now you get some idea about the “Qubits”. Now let us try to understand the basic principles of the Quantum computing.

PRINCIPLES BEHIND QUANTUM COMPUTING

Quantum computing is mainly based on three important principles of quantum mechanics:

(0) Superposition

(1) Entanglement

(2) Quantum interference

Superposition: Superposition allows a quantum system to represent multiple possible states at the same time, giving quantum computers a fundamentally different way of processing information.

Entanglement: It is a special connection that can exist between two or more qubits. When qubits become entangled, their quantum states become correlated, so measuring one qubit is related to the possible measurement of the other, even when they are separated.

For example, imagine two entangled qubits. If one is measured and found to be 0, the result of measuring the other is strongly correlated with the first according to the state they share.

Entanglement is important because it allows quantum computers to create and manipulate relationships between qubits that have no direct equivalent in ordinary classical bits.

Quantum interference is the process by which quantum probability amplitudes can reinforce or cancel one another.

QUANTUM COMPUTING

Quantum algorithms are designed to use interference strategically:

- Constructive interference → increases the probability of desired results.
- Destructive interference → decreases the probability of unwanted results.

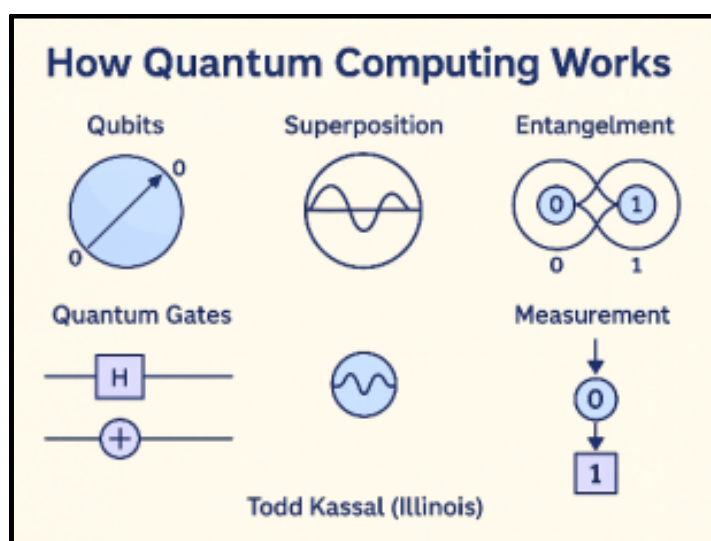
This is one of the key reasons quantum algorithms can obtain useful results from a large space of possibilities.

From this we can understand

Superposition → creates possibilities

Entanglement → connects possibilities

Interference → selects useful possibilities



WORKING OF QUANTAM COMPUTER .

These are the following steps in working:

Qubits → Quantum Gates → Quantum Circuit
→ Quantum Processing → Measurement →
Classical Result

ADVANTAGES:

- Drug Discovery – Simulating molecules and helping develop new medicines.
- Cryptography – Improving cybersecurity and developing quantum-resistant encryption.
- Artificial Intelligence – Potentially improving certain machine-learning and optimization tasks.
- Optimization – Solving complex problems such as route planning, scheduling, and supply chains.
- Materials Science – Simulating atoms and molecules to discover new materials.

- Finance – Helping with risk analysis, portfolio optimization, and financial modelling.
- Climate & Weather Research – Potentially improving simulations of complex environmental systems.
- Energy – Studying materials and chemical processes for better batteries and energy technologies.

Limitations:

- Highly sensitive to noise – Qubits can easily lose their quantum state.
- Decoherence – Interaction with the environment can destroy quantum information.
- Error correction is difficult – Reliable quantum computation requires sophisticated error-correction techniques.
- Expensive hardware – Building and maintaining quantum computers is technically challenging and costly.
- Limited practical applications today – Large-scale, fault-tolerant quantum computers are still under development.

Conclusion:

- Quantum computing represents a new approach to information processing based on quantum mechanics.
- Qubits, superposition, entanglement, and interference are the foundations of quantum computing.
- It has potential applications in medicine, cybersecurity, AI, finance, optimization, and materials science.
- However, challenges such as noise, errors, decoherence, and hardware complexity still need to be overcome.

As the technology develops, quantum computers could become powerful tools that work alongside classical computers to solve problems that are difficult for today's machines

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IOT-BASED DISTRIBUTION TRANSFORMER OVERLOAD AND FAILURE PREDICTION:

INTRODUCTION

Distribution transformers connect medium-voltage distribution feeders to low-voltage consumers and are essential to reliable electricity supply. Increasing demand, electric-vehicle charging, distributed generation and uneven phase loading can produce changing transformer loading profiles. If loading and ambient conditions lead to excessive temperatures, insulation ageing may accelerate. A transformer may also fail because of causes that cannot be inferred from load alone, including insulation defects, moisture, bushing problems, short circuits and poor connections. Conventional protection such as fuses, relays and circuit breakers remains necessary to clear electrical faults. Monitoring and prediction have a different role: they provide visibility into operating trends and can warn staff before an overload or thermal limit is reached. IoT sensors, communication networks and data analytics can support this condition-based maintenance approach. The aim of this review is to summarise a practical, simulation-first architecture and a defensible machine-learning evaluation plan.

LITERATURE REVIEW

Msane, Thango and Ogudo reviewed IoT-based transformer condition monitoring and analysed 120 selected publications from a wider search covering 2014–2024. Their review describes the use of microcontrollers, remote measurements and connected monitoring systems, and identifies fault diagnosis and asset condition assessment as important application areas [1].

Ramesh et al. investigated machine-learning methods for smart distribution-transformer load monitoring and management, demonstrating the relevance of data analytics to changing distribution loads [2]. Rafati, Mirshekali and Shaker proposed overload-alarm prediction using real smart-meter data. Their framework predicts overload alarms at multiple future horizons and considers the limited-data problem for newly installed or reconfigured transformers.

Recent reviews also group overload-platform

methods into traditional machine learning (e.g., Random Forest and support-vector machines), deep learning (e.g., LSTM and GRU) and physics-informed or hybrid approaches [4]. The IEC loading guide for mineral-oil-immersed transformers explains why load and ambient temperature must be considered together when assessing operating temperature and thermal ageing [5]. These sources indicate that IoT monitoring is useful, but model performance depends on data quality, event labels, forecast horizon and deployment context.

RESEARCH GAP

Many proof-of-concept monitoring systems focus on threshold alarms and live dashboards. Prediction is more demanding: an alert must be generated early enough to act, and false alarms must remain manageable. Literature also highlights practical challenges including sparse failure labels, differences between transformers, data imbalance, missing sensor values and the gap between offline model scores and real-world deployment [1, 3, 4].

A useful simulation-based study should compare simple rule-based baselines with machine-learning models under the same time-ordered test conditions. It should distinguish overload forecasting from general failure prediction: load and temperature may support overload-risk estimates, but they cannot reliably identify every internal fault without additional diagnostic evidence such as dissolved-gas analysis or other condition measurements.

OBJECTIVES

Describe an IoT architecture for monitoring distribution-transformer loading and temperature. Define a simulation and Python workflow for data preparation, feature engineering and prediction. Compare candidate algorithms using time-aware validation and rare-event metrics. Identify deployment, cybersecurity and data-quality constraints. Provide a reproducible evaluation plan without claiming unmeasured results.

PROPOSED METHODOLOGY

Data inputs. Use timestamped load current,

IOT-BASED DISTRIBUTION TRANSFORMER OVERLOAD AND FAILURE PREDICTION:

voltage, transformer rated capacity, ambient temperature and measured top-oil or tank-surface temperature where available. Optional variables include phase imbalance, oil level, humidity, tap position, alarm history and maintenance records. The sensor and measurement method must be suitable for the voltage level and installation environment.

Data source and simulation. Prefer real smart-meter or utility data with documented sampling interval, transformer rating and event labels. If public data are unavailable, generate synthetic load profiles for software debugging only. Synthetic labels and scores must be clearly marked as simulated and must not be interpreted as evidence of field accuracy. Split data chronologically into training, validation and test periods; avoid randomly mixing adjacent time samples across splits.

Feature engineering. Candidate features include loading ratio, recent lagged load values, rolling mean and maximum load, temperature trend, ambient temperature, hour of day, weekday/weekend and recent overload duration. All features must be available at the prediction time. Fit scalers and imputation methods on training data only.

Models. Start with a threshold-based baseline and a persistence or logistic-regression baseline. Compare Random Forest and XGBoost for tabular features. Consider LSTM only when sufficient sequential data are available. Define the prediction target explicitly, for example: whether loading will exceed the utility-defined threshold within the next 1–3 hours. A separate failure-risk target requires reliable, time-stamped failure or maintenance labels.

Deployment concept. Sensors connect to an isolated edge gateway, which timestamps and validates readings. A secure protocol such as MQTT over TLS can transmit data to storage and inference services. The dashboard displays trends and risk categories. Local protection remains independent; an IoT prediction must not be used as the sole protective mechanism.

SYSTEM ARCHITECTURE

The proposed system comprises: (i) transformer and measurement sensors; (ii) edge controller for sampling, validation and temporary buffering; (iii) communication link and IoT platform;(iv)

time-series database; (v) Python inference service; and (vi) dashboard and notification module. Access control, device authentication, encryption, software updates and data-quality checks should be designed into the system.

EVALUATION PLAN

Use a chronological test set that represents later operating periods and, where possible, a separate transformer or feeder. Report precision, recall, F1-score, PR-AUC, confusion matrix, false alarms per transformer-day and warning lead time. ROC-AUC may be included but should not be the only metric when overload/failure events are rare. Compare models with the same input variables and prediction horizon, and report confidence intervals or repeated time-based evaluation where data permit.

Conduct ablation checks to assess the value of temperature, calendar features and load history. Examine missing data, sensor noise, seasonal changes and transfer to transformers with limited historical data. The review does not report numerical performance because no dataset was supplied or evaluated for this article.

CONCLUSION

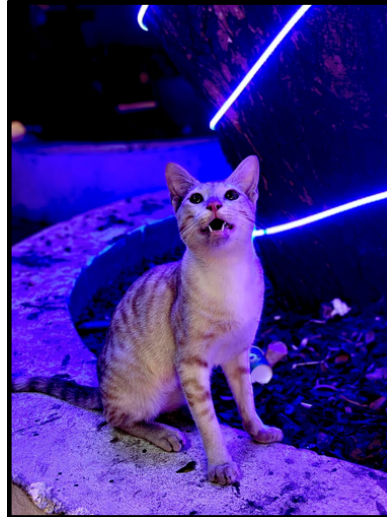
IoT combined with machine learning offers a practical pathway from basic transformer monitoring toward earlier overload warnings and condition-based maintenance. A reliable design needs suitable sensors, secure communications, clear event definitions, realistic time-based validation and metrics that reflect rare but important events. Random Forest and gradient-boosted trees are reasonable first models for tabular measurements, while sequence models may be explored when adequate time-series data exist. Future work should validate the proposed workflow using utility data, document uncertainty and test generalisation across transformers. Conventional protection and engineering assessment remain essential.

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