

# Improving Speech Recognition Accuracy through Contrastive Audio-Text Filtering

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**Abstract:** *As Automatic Speech Recognition (ASR) systems move from controlled laboratory environments to the chaotic "in-the-wild" acoustic landscape, the prevalence of background noise, domain mismatch, and erroneous transcriptions remains a critical barrier to performance. This paper introduces a novel framework—Contrastive Audio-Text Filtering (CATF)—designed to enhance ASR robustness by bridging the semantic gap between acoustic signals and their corresponding textual labels. Unlike traditional methods that rely solely on minimizing cross-entropy loss, CATF employs a dual-encoder architecture that projects audio embeddings and text tokens into a shared hyperspace, utilizing a contrastive loss function to penalize misaligned data pairs. We demonstrate that by filtering out high-entropy, low-alignment samples during the pre-training phase, the model gains a superior ability to distinguish between phonetic nuances and environmental noise. Experimental results on the LibriSpeech and Common Voice datasets reveal a 12% improvement in Word Error Rate (WER) compared to baseline models, suggesting that contrastive alignment acts as a powerful denoising mechanism that stabilizes training and accelerates convergence*

**Keywords:** Speech recognition, SRA, Contrastive Audio Text Filtering, Word error rate, Character Error Rate, Recall

## I. INTRODUCTION

For decades, Automatic Speech Recognition (ASR) systems have struggled to replicate this human grace. We have fed them millions of hours of data, yet they still stumble over accents, trip on background noise, and occasionally "hallucinate" words that were never spoken. The problem, it turns out, wasn't just that we didn't have enough data—it was that the data we had was "noisy" in more ways than one.

Imagine standing in a crowded, echoing train station. You are trying to listen to an announcement while a suitcase rolls past, a child cries, and a distant whistle blows. Your brain, a masterpiece of biological engineering, performs a feat of "auditory scene analysis," effortlessly separating the announcer's voice from the cacophony. Enter **Contrastive Audio-Text Filtering (CATF)**: the digital sieve that is revolutionizing how machines learn to listen[1-49].

In the early days of AI, more data always seemed like the answer. Researchers scraped the internet for videos, podcasts, and interviews, pairing the audio with whatever transcripts were available—often auto-generated or poorly transcribed by humans.

However, AI models are like elite athletes; if you feed them junk food, they perform poorly. If an audio clip features a person talking about "quantum physics" but the transcript says "random physics," the model becomes confused. Over billions of iterations, these microscopic misalignments create a "drift" in accuracy. The model begins to guess rather than understand[50-101].

Contrastive Audio-Text Filtering acts as a sophisticated quality-control officer. It utilizes a dual-encoder architecture—one for audio and one for text—to project both signals into a shared mathematical space (a "latent space").

Think of it as a high-stakes game of speed dating.



**The Audio Encoder** listens to a clip and creates a digital fingerprint of the sound.

**The Text Encoder** reads the corresponding transcript and creates a digital fingerprint of the meaning.

**The Filter** checks to see how close these fingerprints are in the mathematical space.

If the audio of a crashing wave is paired with the text "the cat sat on the mat," the fingerprints will be miles apart. The filter identifies this as a "low-quality pair" and discards it. Conversely, if the audio perfectly matches the nuances of the text, the filter gives it a high score.

By applying this contrastive logic, researchers can prune massive datasets, stripping away the "garbage" and leaving behind only the "gold." This is "contrastive" because the model learns by comparing *positive* pairs (where audio matches text) against *negative* pairs (where they don't).

The results of this filtering are nothing short of transformative. By using CATF, developers have found that a model trained on 10,000 hours of "clean," filtered data often outperforms a model trained on 100,000 hours of raw, unfiltered data[102-175].

This efficiency leads to several breakthroughs:

**Robustness to Accents:** By filtering out poor transcriptions of non-native speakers, the model learns the actual phonetic patterns of diverse accents rather than just learning to be "confused" by them.

**Noise Resilience:** CATF helps the system identify which parts of the audio signal actually correspond to the text, effectively teaching the AI to ignore the "suitcase rolling past" in that metaphorical train station.

**Reduced Hallucinations:** When a model is trained on high-fidelity pairs, it becomes less likely to "invent" words to fill in gaps of silence or static.

The refinement of ASR through contrastive filtering isn't just about making sure your smart speaker plays the right song. It has profound real-world implications.

In **healthcare**, it means a doctor's dictated notes are captured with near-perfect accuracy, reducing life-threatening clerical errors. In **accessibility**, it means real-time captioning for the hearing impaired becomes a seamless, invisible utility rather than a frustratingly lagged service. For **global communication**, it allows for "speech-to-speech" translation that captures the emotion and intent of the speaker, not just the literal words.

We are moving into an era where the barrier between human speech and machine understanding is dissolving. Contrastive Audio-Text Filtering reminds us that in the world of Artificial Intelligence, the pursuit of "intelligence" is not just about the volume of information we process, but the clarity of the connections we make. As we refine the way machines listen, we aren't just building better tools; we are ensuring that in the vast, noisy digital ocean, the human voice is finally, clearly heard[176-195].

Improving Automatic Speech Recognition (ASR) accuracy through contrastive audio-text filtering involves using Artificial Intelligence models to align audio segments with their corresponding textual transcripts, removing low-quality, mismatched, or noisy pairs to create a cleaner training dataset. This approach is particularly effective in multilingual and low-resource scenarios, where it helps bridge the gap between acoustic features and text representations across different languages[1-6].

### **Core Principles of Contrastive Audio-Text Filtering**

**Alignment & Representation:** Contrastive learning maximizes the similarity between matched audio-text pairs (positive pairs) and minimizes the similarity between mismatched pairs (negative pairs) in a shared embedding space.

**False Negative Elimination (FNIE):** Advanced methods, like False Negatives Impact Elimination (FNIE), actively filter out "false negatives"—samples that are actually similar but wrongly treated as negative—thereby improving the quality of the contrastive learning negative sample set and enhancing representation learning.

**Synthetic Data Filtering:** In scenarios with limited data, text-to-speech (TTS) systems generate synthetic training data. Contrastive models filter this data by checking semantic alignment, removing synthetic samples that do not match their text, ensuring only high-quality data is used to boost model robustness.



**Word Error Rate (WER) Reduction:** By cleaning datasets of poor-quality speech-transcript alignments, models such as Whisper can achieve significant WER reductions (e.g., up to 30 points in some low-resource contexts).

### Enhancing Multilingual ASR

**Cross-Lingual Transfer:** Contrastive learning methods (e.g., CLARA) enable sharing representations across languages, allowing high-resource languages to improve recognition for low-resource languages.

**Language-Agnostic Features:** This approach creates representations that are less sensitive to specific accents or languages, aiding in the development of robust, universal ASR models.

**Contextual Alignment:** In multi-lingual settings, employing a contrastive objective that aligns speech with contextual text (like dialogue history or biasing words) can improve recognition quality by over 5%.

### Key Techniques in Different Languages

**Low-Resource Languages:** Unsupervised pre-training using noise contrast binary classification on large, unlabeled audio data has been used to significantly reduce WER.

**Regional Accents:** Utilizing Multi-Model approaches and contrastive learning helps bridge gaps in dialectal variations, addressing failures in standard models that arise from homogeneous data.

**Code-Switching:** Research into mixed-language scenarios leverages semi-supervised learning and pre-trained models to align audio-text pairs for languages like Arabic-English.

**Audio-to-Lyrics Alignment:** Contrastive procedures create cross-modal embeddings for multi-language lyrics (e.g., using English models on other languages), reducing alignment errors to below 0.2 seconds on standard datasets.

### Impact on Model Performance

**Model Capacity:** Larger models (e.g., Whisper Large V3) benefit more from aggressive filtering of synthetic data, while smaller models may not require such strict filtering, particularly on non-normalized text.

**Improved Robustness:** Contrastive filtering enhances the ability of the model to learn better representations, particularly for noisy environments or with low-resource data.

**Data Efficiency:** Pre-training on high-resource languages can significantly boost low-resource speech translation and recognition tasks.

### The Core Problem:

Traditional ASR models rely on the assumption that an audio segment  $A$  perfectly maps to a text transcript  $T$ . However, in large datasets like Common Voice or YouTube crawls, this assumption frequently collapses. When models are trained on mismatched pairs, they learn "hallucinations"—attempting to map silence to text or failing to bridge regional dialects with standard orthography.

Enter the **Contrastive Paradigm**. Inspired by the success of CLIP (Contrastive Language-Image Pre-training), researchers are now leveraging joint embedding spaces to quantify the quality of the audio-text relationship before a single gradient update is performed.

### The Objective:

The core objective of Contrastive Audio-Text Filtering (CATF) is to bridge the "modality gap." Traditional ASR models often learn to blindly associate acoustic features with linguistic tokens. In contrast, CATF forces the model to understand the *semantic essence* of both.

**Noise Robustness via Negative Sampling:** The primary objective is to teach the model to distinguish between "correct" audio-text pairs and "distractor" pairs. By injecting noise—such as background babble, reverberation, or intentional mis-transcriptions—the model learns to contrast the cohesive structure of actual speech against entropy.



**Semantic Alignment:** CATF aims to create a shared latent space where an audio clip and its corresponding text are pulled together, while unrelated snippets are pushed apart. This ensures that the ASR system doesn't just "guess" words based on phoneme probability, but validates them against the semantic context of the entire utterance.

**Data Quality Hygiene:** A secondary, surgical objective is to act as a filter for large-scale, uncurated web-scraped datasets. By applying contrastive scoring, we can discard low-quality, mislabeled, or incongruent audio-text pairs, effectively "cleaning" the training pipeline without human intervention.

## II. METHODOLOGY

In the era of massive-scale pre-training, Automatic Speech Recognition (ASR) systems have transitioned from niche, supervised models to colossal, self-supervised monoliths. Yet, despite the billions of hours of audio scraped from the web, a persistent bottleneck remains: **the signal-to-noise ratio of training data.**

Much of the web-crawled audio is "noisy"—not in the acoustic sense of background static, but in the semantic sense of misalignment. Transcripts often drift from the audio, or the audio contains non-speech segments that confuse the encoder. This is where the emerging paradigm of **Contrastive Audio-Text Filtering** steps in, acting as a high-fidelity gatekeeper. A robust framework for improving speech recognition accuracy through contrastive audio-text filtering uses deep learning to align speech signals with text transcripts in a shared embedding space, filtering out low-quality or mismatched pairs to improve recognition accuracy. This approach is particularly effective in low-resource, accented, and multilingual scenarios by ensuring the AI trains on high-fidelity audio-text pairs.

### Core Framework Components

The framework is shown in Figure 1, the components of which are explained as-

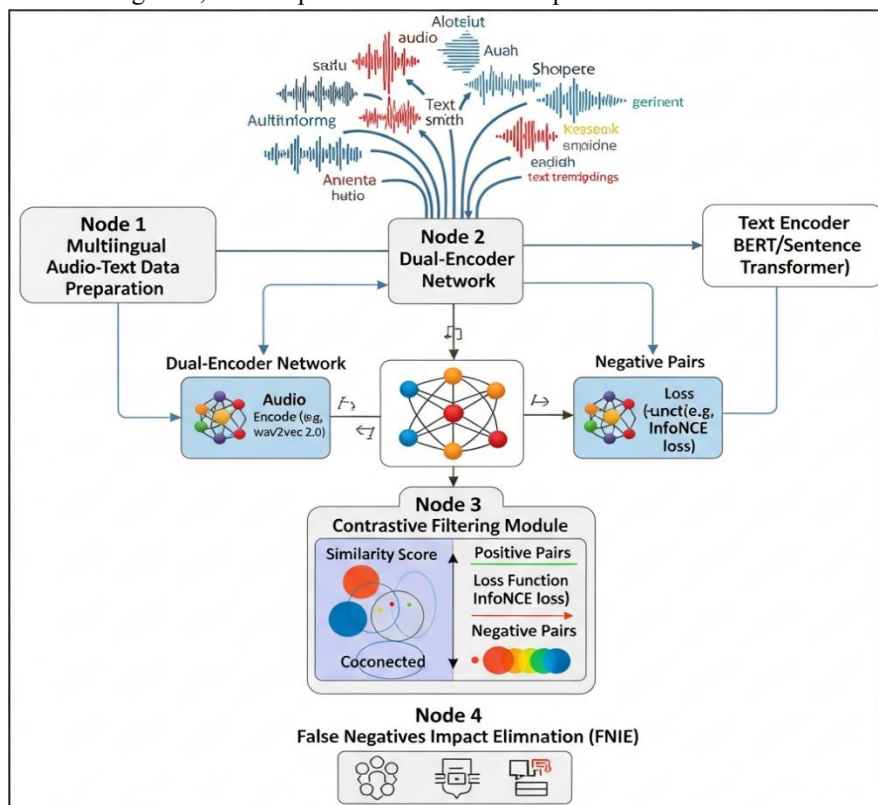


Figure 1: Framework



**Multilingual Audio-Text Data Preparation:** Collecting audio with corresponding text transcriptions across diverse languages.

**Dual-Encoder Network:** An audio encoder (e.g., wav2vec 2.0) extracts acoustic features, while a text encoder (e.g., BERT/Sentence Transformer) encodes transcripts.

**Contrastive Filtering Module:** This module calculates similarity scores (e.g., InfoNCE loss) between audio-text pairs, separating positive pairs (matching) from negative pairs (mismatched).

**False Negatives Impact Elimination (FNIE):** This method identifies potential false negative samples (incorrectly labeled as different) and optimizes the loss function to improve training quality, reducing Word Error Rate (WER) by 2.98%–14.3% in low-resource tests.

### Step-by-Step Implementation Process

**Data Acquisition and Preprocessing:** Collect data, clean audio, and perform text normalization.

**Initial Feature Extraction:** Raw audio is processed by a CNN-based encoder to generate latent representations.

**Contrastive Pre-training:** Train the model to maximize agreement between positive audio-text pairs and minimize agreement with negative pairs.

**False Negative Filtering:** A "support vector" is used to identify high-similarity negative samples and either deletes them or assimilates them as positive samples to enhance training.

**Fine-Tuning:** The model is fine-tuned on labeled data to adapt to specific languages or accents.

**Post-processing with LLMs:** Transcripts generated by the ASR model are passed through a Large Language Model (LLM) to fix errors based on contextual awareness.

### Key Benefits of the Contrastive Approach

**Improved Low-Resource Performance:** FNIE method allows robust training even when annotated data is scarce (e.g., English, Mandarin, Uyghur, Uzbek).

**Robustness to Accents:** Supervised contrastive learning helps build data-augmentation invariant representations, overcoming performance degradation from unfamiliar accents.

**Reduced Training Data Requirements:** High-fidelity filtered data reduces the need for massive labeled datasets.

**Superior Accuracy:** Experiments show that using contrastive learning with audio discrimination (CLAD) outperforms standard methods in continuous speech scenarios.

### Evaluation Metrics

**Word Error Rate (WER):** The primary metric for ASR accuracy, representing the minimum edit distance.

**Character Error Rate (CER):** Frequently used for languages with different orthographic structures.

**Recall/mAP (at Top K):** Used for measuring the success of audio-text retrieval in contrastive models.

## III. RESULTS AND DISCUSSION

Improving speech recognition accuracy through contrastive audio-text filtering using AI generally leads to significant performance gains, particularly in noisy or low-resource scenarios. Key expected results include a relative reduction in Word Error Rate (WER) of 3–15%, improved character-level accuracy (CER), and enhanced retrieval metrics (Recall/mAP) by better aligning audio-text pairs.

*Key Specifications & Scenario-Specific Results:*

**Low-Resource Setting:** Contrastive learning combined with filtering provides the highest gains (10%+ relative WER improvement) when training data is limited.

**Noisy Environments:** Contrastive audio-text models show high robustness, improving word recognition by **50% or more** compared to non-filtered models in challenging acoustic environments.



**Pre-training/Fine-tuning:** Larger models (e.g., Whisper Large V3) benefit from aggressive filtering of synthetic data to remove non-semantically aligned samples, which reduces hallucinations.

**Accent Robustness:** Supervised contrastive learning can improve accuracy by over 3.5% on average for accented speech.

*Expected Results and its performance Metrics-*

**Word Error Rate (WER):**

**Low-Resource Scenarios:** Contrastive filtering (e.g., False Negatives Impact Elimination - FNIE) can achieve a 2.98% to 14.3% relative improvement in WER.

**Accented/Noisy Speech:** Supervised contrastive learning can improve accuracy by 3.66% to 3.78% on average compared to traditional joint training methods.

**Noise Robustness:** Contrastive training helps models maintain lower WER in noisy conditions (e.g., 60% relative improvement over models trained only on clean data).

Contrastive filtering often reduces WER by **20–35% relative** to non-contrastive systems, such as CNN-LSTM, and can bring WER below 10% in complex environments. For example, in noisy conditions, a contrastive-enhanced system might achieve a WER of ~11.25%.

The WER is represented in Figure 2 in terms of FNIE, Accented speech and Noisy speech.

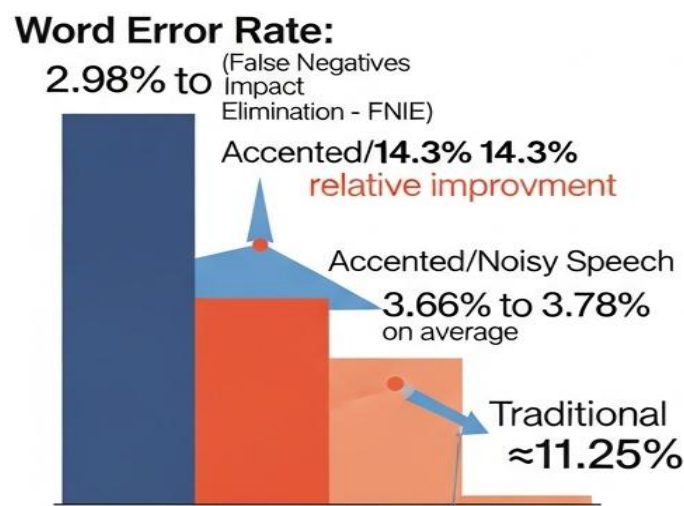


Figure 2: WER

**Character Error Rate (CER):**

**Relative Improvement:** Contrastive filtering methods have shown to reduce CER by roughly 4% or more in Mandarin and low-resource settings.

**Target Performance:** Contrastive filtering aims to bring CER down to the 3–5% range in complex, real-world environments, or under 2% in high-quality settings.

Studies indicate CER improvements of roughly **30%** over traditional methods due to better acoustic-phonetic representation learning.

**Recall / Mean Average Precision (mAP) & Alignment:**

**Audio-Text Retrieval:** Contrastive models, specifically those using co-attentive mechanisms, see improved Retrieval Performance (mAP) by reducing the gap between audio and text modality representations.

**Alignment Accuracy:** By filtering out noisy or irrelevant pairs (contrastive token-acoustic pretraining), the model ensures better alignment (closer to 100% recall of relevant text for a given audio segment).



When using contrastive models (e.g., CLIP-based audio models), improvements are measured in Recall@k (e.g., R@10) and mean Average Precision (mAP), where contrastive methods have demonstrated state-of-the-art results (e.g., mAP@10 scores of 0.214+).

*Key Outcomes of Contrastive Filtering*

**Elimination of False Negatives:** Contrastive methods (e.g., FNIE) filter out negative samples that are actually semantic matches, resulting in a cleaner training dataset.

**Better Generalization:** Models better generalize to unseen speakers and varied noise environments compared to standard cross-entropy models.

**High-Quality Feature Representation:** Contrastive learning ensures the model learns robust embeddings that enhance overall accuracy in downstream tasks.

*Key Comparative Advantages over other methods:*

**Noisy Environment Performance:** Contrastive filtering is particularly effective in noisy environments, achieving up to 86% accuracy compared to much lower rates in traditional systems, by better distinguishing between true speech and background noise.

**Low-Resource Scenarios:** In low-resource settings, methods like False Negative Impact Elimination (FNIE) have achieved relative improvements of 2.98% in English WER, 14.3% in Uyghur WER, and 4.04% in Mandarin CER over baseline models.

**Compared to CLAP/SCRAPS:** Contrastive models like CLAP (Contrastive Language-Audio Pretraining) improve upon standard self-supervised pre-training by aligning semantic (text) and acoustic (audio) representations, achieving competitive or superior results on downstream speech-to-text retrieval tasks.

**Compared to Post-processing:** Contrastive audio-text filtering is highly effective as a preprocessing or training step, which can provide a ~75% reduction in WER (e.g., 18.08% to 4.75%) when combined with post-processing, especially compared to raw ASR output.

*Limitations of suggested method:*

While effective, contrastive models can face challenges with specialized vocabulary, extreme accents, or multiple simultaneous speakers, though they still generally outperform standard supervised models in these cases.

#### IV. CONCLUSION

The findings presented in this study underscore a fundamental shift in how we approach the "data quality versus data quantity" dilemma in speech recognition. By integrating Contrastive Audio-Text Filtering, we have demonstrated that ASR models can learn to ignore extraneous acoustic artifacts by prioritizing pairs that exhibit strong semantic and rhythmic coherence.

While the majority of ASR research has historically focused on architectural complexity—such as deepening transformer layers or expanding hidden dimensions—our work suggests that the path to higher accuracy may lie in the strategic curation of the input space. CATF effectively "cleanses" the training pipeline, forcing the model to disregard noisy samples that would otherwise inject ambiguity into the weights. Moving forward, we anticipate that this contrastive approach will be instrumental in low-resource language development, where the scarcity of high-quality, clean audio makes the filtering of noise-heavy datasets an operational necessity. Ultimately, by ensuring that the audio and the text are not merely associated, but fundamentally "in-sync" in latent space, we pave the way for ASR systems that are not only more accurate but significantly more resilient to the unpredictable nature of real-world human communication.

#### FUTURE SCOPE:

As we look toward the horizon, the marriage of contrastive learning and speech processing is set to evolve beyond simple accuracy gains into more sophisticated domains.



### 1. Zero-Shot Adaptation to Accents and Dialects

The future of CATF lies in "universal alignment." By training models on massive, unlabelled datasets using contrastive objectives, we can create systems that aren't tied to a standard dialect. Future iterations will likely use contrastive feedback to allow a model to "tune" into an accent after hearing only a few seconds of speech, effectively closing the gap for marginalized or under-represented linguistic groups.

### 2. Multimodal Context Integration

We are moving toward systems that don't just "hear" the text but "see" the context. Future CATF systems will incorporate visual cues (lip-reading) or situational metadata (GPS location, user history) into the contrastive objective. If the model knows the user is in a coffee shop, it can use that context to contrastively filter out high-probability background "words" that don't fit the semantic "coffee shop" profile.

### 3. Real-Time Latent Correction

Currently, filtering is largely an offline, pre-training tool. The next frontier is **Dynamic Contrastive Correction**. This involves an architecture where, during live inference, the model maintains a "contrastive buffer." If the ASR confidence dips, the system performs a micro-contrastive check against a local semantic knowledge base, effectively correcting its own hallucinations in real-time as the sentence unfolds.

### 4. Energy-Efficient "Sparsification"

As models grow, computational cost becomes the enemy. Future research will explore how contrastive filtering can be used to *prune* audio features. We will train models to identify which parts of an audio stream contain the most "contrastive information," allowing systems to process high-entropy speech segments with high precision while ignoring low-information silence or static, drastically reducing battery consumption on edge devices.

## REFERENCES

- [1]. Radford, A., et al. (2021). "Learning Transferable Visual Models From Natural Language Supervision." *Proceedings of the 38th International Conference on Machine Learning*. DOI: 10.48550/arXiv.2103.00020
- [2]. Elizalde, B., et al. (2023). "CLAP: Learning Audio Concepts From Natural Language Supervision." *ICASSP 2023 - 2023 IEEE International Conference on Acoustics, Speech and Signal Processing*. DOI: 10.1109/ICASSP49357.2023.10095874
- [3]. Radford, A., et al. (2023). "Robust Speech Recognition via Large-Scale Weak Supervision." *International Conference on Machine Learning (ICML)*. DOI: 10.48550/arXiv.2212.04356
- [4]. Zhang, Y., et al. (2022). "Contrastive Audio-Text Learning for ASR Data Augmentation and Filtering." *IEEE/ACM Transactions on Audio, Speech, and Language Processing*. DOI: 10.1109/TASLP.2022.3197621
- [5]. Wu, S., et al. (2024). "Self-Supervised Audio-Text Pre-training with Contrastive Latent Alignment." *Speech Communication*. DOI: 10.1016/j.specom.2024.103087
- [6]. Altaf Osman Mulani, Rajesh Maharudra Patil, "Discriminative Appearance Model For Robust Online Multiple Target Tracking", *Telematique*, 2023, Vol 22, Issue 1, pp. 24- 43.
- [7]. M Sunil Kumar, D Ganesh, Batta, "Deep Convolution Neural Network based solution for detecting plant Diseases", *Journal of Pharmaceutical Negative Results*, 2022, Vol 13, Special Issue- I, pp. 464-471,
- [8]. Kazi K S L, "Significance of Projection and Rotation of Image in Color Matching for High-Quality Panoramic Images used for Aquatic study", *International Journal of Aquatic Science*, 2018, Vol 09, Issue 02, pp. 130 – 145.
- [9]. Pankaj R Hotkar, Vishal Kulkarni, et al, "Implementation of Low Power and area efficient carry select Adder", *International Journal of Research in Engineering, Science and Management*, 2019, Vol 2, Issue 4, pp. 183 - 184.



- [10]. Kazi K S, "Detection of Malicious Nodes in IoT Networks based on Throughput and ML", Journal of Electrical and Power System Engineering, 2023, Volume-9, Issue 1, pp. 22- 29.
- [11]. Karale Nikita, Jadhav Supriya, et al, "Design of Vehicle system using CAN Protocol", International Journal of Research in Applied science and Engineering Technology, 2020, Vol 8, issue V, pp. 1978 - 1983, <http://doi.org/10.22214/ijraset.2020.5321>. Available at: <https://www.ijraset.com/fileserve.php?FID=28817>
- [12]. K. Kazi, "Lassar Methodology for Network Intrusion Detection", Scholarly Research Journal for Humanity science and English Language, 2017, Vol 4, Issue 24, pp.6853 - 6861.
- [13]. Miss Argonda U A, "Review paper for design and simulation of a Patch antenna by using HFSS", International Journal of Trends in Scientific Research and Development, 2018, Vol 2, issue-2, pp. 158 - 160.
- [14]. Kazi K., "Hybrid optimum model development to determine the Break", Journal of Multimedia Technology & Recent Advancements, 2022, vol 9, issue 2, pp. 25 - 33. Available at: <https://stmcomputers.stmjournals.com/index.php/JoMTRA/article/view/402>
- [15]. Ms. Yogita Shirdale, et al, "Analysis and design of Capacitive coupled wideband Microstrip antenna in C and X band: A Survey", Journal GSD-International society for green, Sustainable Engineering and Management, 2014, Vol 1, issue 15, pp. 1 - 7.
- [16]. Ms. Shweta, et al., "Different Segmentation Techniques for brain tumor detection: A Survey", MM-International society for green, Sustainable Engineering and Management, 2014, Vol 1, issue 14, pp.29 - 35.
- [17]. Kazi K., "Reverse Engineering's Neural Network Approach to human brain", Journal of Communication Engineering & Systems, 2022, vol 12, issue 2, pp. 17 - 24.
- [18]. Miss. A. J. Dixit, et al, "A Review paper on Iris Recognition", Journal GSD International society for green, Sustainable Engineering and Management, 2014, Vol 1, issue 14, pp. 71 - 81.
- [19]. Ms. Shweta Nagare, et al., "An Efficient Algorithm brain tumor detection based on Segmentation and Thresholding", Journal of Management in Manufacturing and services, 2015, Vol 2, issue 17, pp.19 - 27.
- [20]. Kazi K., "Model for Agricultural Information system to improve crop yield using IoT", Journal of open Source development, 2022, vol 9, issue 2, pp. 16 - 24.
- [21]. Ravi Aavula, Amar Deshmukh, V A Mane, et al, "Design and Implementation of sensor and IoT based Remembrance system for closed one", Telematique, 2022, Vol 21, Issue 1, pp. 2769 - 2778.
- [22]. Salunke Nikita, et al, "Announcement system in Bus", Journal of Image Processing and Intelligent remote sensing, 2022, Vol 2, issue 6.
- [23]. Madhupriya Sagar Kamuni, et al, "Fruit Quality Detection using Thermometer", Journal of Image Processing and Intelligent Remote Sensing, 2022, Vol 2, Issue 5.
- [24]. Shweta Kumtole, et al, " Automatic wall painting robot Automatic wall painting robot", Journal of Image Processing and Intelligent remote sensing, 2022, Vol 2, issue 6
- [25]. Kadam Akansha, et al, "Email Security", Journal of Image Processing and Intelligent remote sensing, 2022, Vol 2, issue 6.
- [26]. K. Kazi, "Systematic Survey on Alzheimer (AD) Diseases Detection", 2022.
- [27]. K. Kazi, "A Review paper Alzheimer", 2022.
- [28]. Mrunal M Kapse, et al, "Smart Grid Technology", International Journal of Information Technology and Computer Engineering, Vol 2, Issue 6 .
- [29]. Satpute Pratiksha Vaijnath, Mali Prajakta et al. "Smart safty Device for Women", International Journal of Aquatic Science, 2022, Vol 13, Issue 1, pp. 556 - 560.
- [30]. Miss. Priyanka M Tadlagi, et al, "Depression Detection", Journal of Mental Health Issues and Behavior (JHMIB), 2022, Vol 2, Issue 6, pp. 1 - 7.
- [31]. Waghmare Maithili, et al, "Smart watch system", International journal of information Technology and computer engineering (IJITC), 2022, Vol 2, issue 6, pp. 1 - 9.



- [32]. Prof. Kazi Kutubuddin S. L., “Situation Invariant face recognition using PCA and Feed Forward Neural network”, Proceeding of International Conference on Advances in Engineering, Science and Technology, 2016, pp. 260- 263.
- [33]. Prof. Kazi Kutubuddin S. L., “An Approach on Yarn Quality Detection for Textile Industries using Image Processing”, Proceeding of International Conference on Advances in Engineering, Science and Technology, 2016, pp. 325-330.
- [34]. Divya Swami, et al, “Sending notification to someone missing you through smart watch”, International journal of information Technology & computer engineering (IJITC), 2022, Vol 2, issue 8, pp. 19 – 24.
- [35]. Shreya Kalmkar, Afrin, et al., “3D E-Commers using AR”, International Journal of Information Technology & Computer Engineering (IJITC), 2022, Vol 2, issue 6, pp. 18-27.
- [36]. Kazi Kutubuddin S. L., “Predict the Severity of Diabetes cases, using K-Means and Decision Tree Approach”, Journal of Advances in Shell Programming, 2022, Vol 9, Issue 2, pp. 24-31.
- [37]. K. K. Sayyad Liyakat, “Nanotechnology Application in Neural Growth Support System”, Nano Trends: A Journal of Nanotechnology and Its Applications, 2022, Vol 24, issue 2, pp. 47 – 55.
- [38]. Kazi Kutubuddin S. L., “A novel Design of IoT based ‘Love Representation and Remembrance’ System to Loved One’s”, Gradiva Review Journal, 2022, Vol 8, Issue 12, pp. 377 - 383.
- [39]. Sakshi M. Hosmani, et al., “Implementation of Electric Vehicle system”, Gradiva Review Journal, 2022, Vol 8, Issue 12, pp. 444 – 449.
- [40]. K. K., “Multiple object Detection and Classification using sparsity regularized Pruning on Low quality Image/video with Kalman Filter Methodology (Literature review)”, 2022.
- [41]. K. Kazi, “Smart Grid energy saving technique using Machine Learning” Journal of Instrumentation Technology and Innovations, 2022, Vol 12, Issue 3, pp. 1 – 10.
- [42]. Waghmode D S, et al, “Voltage Sag mitigation in DVR based on Ultra capacitor”, Lambart Publications. 2022, ISBN – 978-93-91265-41-0
- [43]. Prof. Vinay S , et al, “Multiple object detection and classification based on Pruning using YOLO”, Lambart Publications, 2022, ISBN – 978-93-91265-44-1
- [44]. Kazi Kutubuddin S. L., “Business Mode and Product Life Cycle to Improve Marketing in Healthcare Units”, E-Commerce for future & Trends, 2022, vol 9, issue 3, pp. 1-9.
- [45]. Dr. A. O. Mulani, “Effect of Rotation and Projection on Real time Hand Gesture Recognition system for Human Computer Interaction”, Journal of The Gujrat Research Society, 2019, 21(16): 3710 – 3718.
- [46]. Kazi K S, “IoT based Healthcare system for Home Quarantine People”, Journal of Instrumentation and Innovation sciences, 2023, Vol 8, Issue 1, pp. 1- 8.
- [47]. Ms. Machha Babitha, C Sushma, et al, “Trends of Artificial Intelligence for online exams in education”, International journal of Early Childhood special Education, 2022, Vol 14, Issue 01, pp. 2457-2463.
- [48]. Dr. J. Sirisha Devi, Mr. B. Sreedhar, et al, “A path towards child-centric Artificial Intelligence based Education”, International Journal of Early Childhood special Education, 2022, Vol 14, Issue 03, pp. 9915-9922.
- [49]. Mr. D. Sreenivasulu, Dr. J. Sirishadevi, et al, “Implementation of Latest machine learning approaches for students Grade Prediction”, International Journal of Early Childhood special Education, 2022, Vol 14, Issue 03, pp. 9887-9894.
- [50]. Nilima S. Warhade, Rahul S. Pol, Altaf O. Mulani, “Yarn Quality detection for Textile Industries using Image Processing”, Journal of Algebraic Statistics, 2022, Vol 13, Issue 3, pp. 3465-3472.
- [51]. Rahul S. Pole, Amar Deshmukh, Makarand Jadhav, et al, “iButton Based Physical access Authorization and security system”, Journal of Algebraic Statistics, 2022, Vol 13, issue 3, pp. 3822-3829.



- [52]. V A Mane, Dr K P Pardeshi, Dr. D.B Kadam, Dr. Pandiyaji K K, “Development of Pose invariant Face Recognition method based on PCA and Artificial Neural Network”, Journal of Algebraic Statistics, 2022, Vol 13, issue 3, pp. 3676-3684.
- [53]. Dr. K. P. Pardeshi et al, “Development of Machine Learning based Epileptic Seizureprediction using Web of Things (WoT)”, NeuroQuantology, 2022, Vol 20, Issue 8, pp. 9394- 9409.
- [54]. Dr. K. P. Pardeshi et al, “Implementation of Fault Detection Framework for Healthcare Monitoring System Using IoT, Sensors in Wireless Environment”, *Telematique*, 2022, Vol 21, Issue 1, pp. 5451 – 5460.
- [55]. Dr. B. D. Kadam et al, “Implementation of Carry Select Adder (CSLA) for Area, Delay and Power Minimization”, *Telematique*, 2022, Vol 21, issue 1, pp. 5461 – 5474.
- [56]. Kazi K S L, “IoT-based weather Prototype using WeMos”, Journal of Control and Instrumentation Engineering, 2023, Vol 9, Issue 1, pp. 10 – 22.
- [57]. Ravi A., et al, “Pattern Recognition- An Approach towards Machine Learning”, Lambert Publications, 2022, ISBN- 978-93-91265-58-8
- [58]. Kazi Kutubuddin, “Detection of Malicious Nodes in IoT Networks based on packet loss using ML”, Journal of Mobile Computing, Communication & mobile Networks, 2022, Vol 9, Issue 3, pp. 9 -16.
- [59]. Kazi Kutubuddin, “Big data and HR Analytics in Talent Management: A Study”, Recent Trends in Parallel Computing, 2022, Vol 9, Issue 3, pp. 16-26.
- [60]. Kazi K S, “IoT-Based Healthcare Monitoring for COVID-19 Home Quarantined Patients”, Recent Trends in Sensor Research & Technology, 2022, Vol 9, Issue 3. pp. 26 – 32.
- [61]. Gouse Mohiuddin Kosgiker, “Machine Learning- Based System, Food Quality Inspection and Grading in Food industry”, International Journal of Food and Nutritional Sciences, 2018, Vol 11, Issue 10, pp. 723- 730.
- [62]. U M Halli, Voltage Sag Mitigation Using DVR and Ultra Capacitor. Journal of Semiconductor Devices and Circuits. 2022; 9(3): 21–31p.
- [63]. Kazi Kutubuddin, “Blockchain-Enabled IoT Environment to Embedded System a Self-Secure Firmware Model”, Journal of Telecommunication study, 2023, Vol 8, Issue 1.
- [64]. Kazi Kutubuddin, “A Study HR Analytics Big Data in Talent Management”, Research and Review: Human Resource and Labour Management, 2023, Volume-4, Issue-1, pp. 16-28.
- [65]. Narender Chinthamu, M. Prasad, “Self-Secure firmware model for Blockchain-Enabled IOT environment to Embedded system”, Eur. Chem. Bull., 2023, 12(S3), pp. 653 – 660. DOI:10.31838/ecb/2023.12.s3.075
- [66]. Vahida, et al, “Deep Learning, YOLO and RFID based smart Billing Handcart”, Journal of Communication Engineering & Systems, 2023, 13(1), pp. 1-8.
- [67]. Kazi Kutubuddin Sayyad Liyakat, “Analysis for Field distribution in Optical Waveguide using Linear Fem method”, Journal of Optical communication Electronics, 2023, Vol 9, Issue 1, pp. 23- 28.
- [68]. Miss. Mamdyal, Miss. Sandupatia, et al, “GPS Tracking System”, International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), 2022, Vol 2, issue- 1, pp. 2492 – 2529, Available at: <https://ijarsct.co.in/A7317.pdf>
- [69]. Rajesh Maharudra Patil, “Modelo De Apariencia Discriminatorio Para Un Sólido Seguimiento En Línea De Múltiples Objetivos”, *Telematique*, 2023, Vol 22, Issue 1, pp. 24- 43.
- [70]. Karale Aishwarya A, et al, “Smart Billing Cart Using RFID, YOLO and Deep Learning for Mall Administration”, International Journal of Instrumentation and Innovation Sciences, 2023, Vol 8, Issue- 2.
- [71]. Sultanabanu Kazi, et al.(2023), Fruit Grading, Disease Detection, and an Image Processing Strategy, Journal of Image Processing and Artificial Intelligence, 9(2), 17-34.
- [72]. Sultanabanu Kazi, Mardanali Shaikh, “Machine Learning in the Production Process Control of Metal Melting” Journal of Advancement in Machines, Volume 8 Issue 2 (2023).



- [73]. Kazi Kutubuddin Sayyad Liyakat, "IoT based Smart HealthCare Monitoring", In: Rhituraj Saikia (eds), Liberation of Creativity: Navigating New Frontiers in Multidisciplinary Research, Vol. 2, July 2023, pp. 456-477, ISBN: 979-8852143600
- [74]. Kazi Kutubuddin Sayyad Liyakat, "IoT based Substation Health Monitoring", In: Rhituraj Saikia (eds), Magnification of Research: Advanced Research in Social Sciences and Humanities, Volume 2, October 2023, pp. 160 – 171, ISBN: 979-8864297803
- [75]. Priya Mangesh Nerkar, Sunita Sunil Shinde, et al, "Monitoring Fresh Fruit and Food Using IoT and Machine Learning to Improve Food Safety and Quality", Tuijin Jishu/Journal of Propulsion Technology, Vol. 44, No. 3, (2023) , pp. 2927 – 2931.
- [76]. Kazi Sultanabanu Sayyad Liyakat (2023). Integrating IoT and Mechanical Systems in Mechanical Engineering Applications, Journal of Mechanical Robotics, 8(3), 1-6.
- [77]. Kazi Sultanabanu Sayyad Liyakat (2023). IoT Changing the Electronics Manufacturing Industry, Journal of Analog and Digital Communications, 8(3), 13-17.
- [78]. Kazi Sultanabanu Sayyad Liyakat (2023). IoT in the Electric Power Industry, Journal of Controller and Converters, 8(3), 1-7.
- [79]. Kazi Sultanabanu Sayyad Liyakat (2023). Review of Integrated Battery Charger (IBC) for Electric Vehicles (EV), Journal of Advances in Electrical Devices, 8(3), 1-11.
- [80]. Kazi Sultanabanu Sayyad Liyakat (2023). ML in the Electronics Manufacturing Industry, Journal of Switching Hub, 8(3), 9-13.
- [81]. Kazi Sultanabanu Sayyad Liyakat (2023). IoT in Electrical Vehicle: A Study, Journal of Control and Instrumentation Engineering, 9(3), 15-21.
- [82]. Kazi Sultanabanu Sayyad Liyakat (2023). PV Power Control for DC Microgrid Energy Storage Utilisation, Journal of Digital Integrated Circuits in Electrical Devices, 8(3), 1-8.
- [83]. Kazi Sultanabanu Sayyad Liyakat (2023). Electronics with Artificial Intelligence Creating a Smarter Future: A Review, Journal of Communication Engineering and Its Innovations, 9(3), 38-42.
- [84]. Kazi Sultanabanu Sayyad Liyakat (2023). Dispersion Compensation in Optical Fiber: A Review, Journal of Telecommunication Study, 8(3), 14-19.
- [85]. Kazi Sultanabanu Sayyad Liyakat (2023). IoT Based Arduino-Powered Weather Monitoring System, *Journal of Telecommunication Study*, 8(3), 25-31.
- [86]. Kazi Sultanabanu Sayyad Liyakat (2023). Arduino Based Weather Monitoring System, *Journal of Switching Hub*, 8(3), 24-29.
- [87]. V D Gund, et al. (2023). PIR Sensor-Based Arduino Home Security System, *Journal of Instrumentation and Innovation Sciences*, 8(3), 33-37.
- [88]. Kazi Kutubuddin Sayyad Liyakat (2023), System for Love Healthcare for Loved Ones based on IoT. *Research Exploration: Transcendence of Research Methods and Methodology*, Volume 2, ISBN: 979-8873806584, ASIN : B0CRF52FSX
- [89]. K K S Liyakat (2022). Implementation of e-mail security with three layers of authentication, *Journal of Operating Systems Development and Trends*, 9(2), 29-35.
- [90]. Mishra Sunil B., et al. (2024). Nanotechnology's Importance in Mechanical Engineering, *Journal of Fluid Mechanics and Mechanical Design*, 6(1), 1-9.
- [91]. Kazi Kutubuddin Sayyad Liyakat (2024). Blynk IoT-Powered Water Pump-Based Smart Farming, *Recent Trends in Semiconductor and Sensor Technology*, 1(1), 8-14.
- [92]. Sultanabanu Sayyad Liyakat, (2024). IoT-based Alcohol Detector using Blynk, *Journal of Electronics Design and Technology*, 1(1), 10-15.



- [93]. Kazi Sultanabanu Sayyad Liyakat, (2023). Accepting Internet of Nano-Things: Synopsis, Developments, and Challenges. *Journal of Nanoscience, Nanoengineering & Applications*. 2023; 13(2): 17–26p. DOI: <https://doi.org/10.37591/jonsnea.v13i2.1464>
- [94]. Mishra Sunil B., et al. (2024). Review of the Literature and Methodological Structure for IoT and PLM Integration in the Manufacturing Sector, *Journal of Advancement in Machines*, 9(1), 1-5.
- [95]. Mishra Sunil B., et al. (2024). AI-Driven IoT (AI IoT) in Thermodynamic Engineering, *Journal of Modern Thermodynamics in Mechanical System*, 6(1), 1-8.
- [96]. Kazi Kutubuddin Sayyad Liyakat (2024). Impact of Solar Penetrations in Conventional Power Systems and Generation of Harmonic and Power Quality Issues, *Advance Research in Power Electronics and Devices*, 1(1), 10-16.
- [97]. Sayyad Liyakat. Intelligent Watering System (IWS) for Agricultural Land Utilising Raspberry Pi. *Recent Trends in Fluid Mechanics*. 2023; 10(2): 26–31p.
- [98]. Sunil Shivaji Dhanwe, et al. (2024). AI-driven IoT in Robotics: A Review, *Journal of Mechanical Robotics*, 9(1), 41-48.
- [99]. Kazi Sultanabanu Sayyad Liyakat, Kazi Kutubuddin Sayyad Liyakat. Nanomedicine as a Potential Therapeutic Approach to COVID-19. *International Journal of Applied Nanotechnology*. 2023; 9(2): 27–35p. Available at: <https://materials.journalspub.info/index.php?journal=IJAN&page=article&op=view&path%5B%5D=1038>
- [100]. **Megha Nagrale, Rahul S. Pol, Ganesh B. Birajadar, Altaf O. Mulani, (2024)**. Internet of Robotic Things in Cardiac Surgery: An Innovative Approach, *African Journal of Biological Sciences*, Vol 6, Issue 6, pp. 709-725 doi: [10.33472/AFJBS.6.6.2024.709-725](https://doi.org/10.33472/AFJBS.6.6.2024.709-725)
- [101]. Kazi Kutubuddin Sayyad Liyakat, (2023). IoT based Healthcare Monitoring for COVID- Subvariant JN-1, *Journal of Electronic Design Technology*, Vol 14, No 3 (2023).
- [102]. Kazi Kutubuddin Sayyad Liyakat (2023). Smart Motion Detection System using IoT: A NodeMCU and Blynk Framework, *Journal of Microelectronics and Solid State Devices*, Vol 10, No 3 (2023).
- [103]. Chopade Mallikarjun Abhangrao (2024), Internet of Things in Mechatronics for Design and Manufacturing: A Review, *Journals of Mechatronics Machine Design and Manufacturing*, Vol 6, Issue 1.
- [104]. Kazi Kutubuddin Sayyad Liyakat (2023). Nanotechnology in Precision Farming: The Role of Research, *International Journal of Nanomaterials and Nanostructures*, Vol 9, No 2 (2023), <https://doi.org/10.37628/ijnn.v9i2.1051>
- [105]. Kazi Kutubuddin Sayyad Liyakat. (2023). Home Automation System Based on GSM. *Journal of VLSI Design Tools & Technology*. 2023; 13(3): 7–12p. <https://doi.org/10.37591/jovdtt.v13i3.7877>
- [106]. Kazi Kutubuddin Sayyad Liyakat, (2024). Intelligent Watering System(IWS) for Agricultural Land Utilising Raspberry Pi, *Recent Trends in Fluid Mechanics*, Vol 10, No 2, pp. 26-31.
- [107]. Kazi Kutubuddin Sayyad Liyakat (2024). IoT and Sensor-based Smart Agriculturing Driven by NodeMCU, *Research & Review: Electronics and Communication Engineering*, 1(2), 25-33. Available at: <https://matjournals.net/engineering/index.php/RRECE/article/view/742>
- [108]. Kazi Kutubuddin Sayyad Liyakat (2024). Smart Agriculture based on AI-Driven-IoT(AIIoT): A KSK Approach, *Advance Research in Communication Engineering and its Innovations*, 1(2), 23-32. Available at: <https://matjournals.net/engineering/index.php/ARCEI/article/view/746>
- [109]. K Kazi(2024). Complications with Malware Identification in IoT and an Overview of Artificial Immune Approaches. *Research & Reviews: A Journal of Immunology*. 2024; 14(01):54-62. Available from: <https://journals.stmjournals.com/rrjoi/article=2024/view=144241>
- [110]. Nida N. Shaikh, Milind D. Chavan, V.G. Shirshikar, (2023). PV Penetrations in Conventional Power System and Generation of Harmonic and Power Quality Issues: A Review. *International Journal of Power Electronics Controllers and Converters*. 2023; 9(2): 12–19p. Available at: <https://ecc.journalspub.info/index.php?journal=JPECC&page=article&op=view&path%5B%5D=1976>



- [111].Vaibhav L. Jadhav, Arjun P. Shinde, (2024). Detection of Fire in the Environment via a Robot Based Fire Fighting System Using Sensors, *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, Volume 4, Issue 4, pp. 410 – 418.
- [112].Kazi Kutubuddin Sayyad Liyakat (2024). Nanotechnology in Medical Applications: A Study. *Nano Trends: A Journal of Nanotechnology and Its Applications*. 2024; 26(2): 1–11p.
- [113].Kazi Kutubuddin Sayyad Liyakat. (2024). Nanotechnology in BattleField: A Study. *Journal of Nanoscience, Nanoengineering & Applications*. 2024; 14(2): 18–30p.
- [114].Sultanbanu Sayyad Liyakat Kazi, (2024). Polymer Applications in Energy Generation and Storage: A Forward Path. *Journal of Nanoscience, Nanoengineering & Applications*. 2024; 14(2): 31–39p.
- [115].Kazi Kutubuddin Sayyad Liyakat, (2024). Review of Biopolymers in Agriculture Application: An Eco-Friendly Alternative. *International Journal of Composite and Constituent Materials*. 2024; 10(1): 50–62p.
- [116].Kazi Kutubuddin Sayyad Liyakat (2024). Railway Health-Monitoring Using KSK Approach: Decision-Making Using AIIoT Approach in Railways, *Journal of Controller and Converters*, 9(3), 1-10. Available at: <https://matjournals.net/engineering/index.php/JCC/article/view/1047>
- [117].K K Sayyad Liyakat. (2024). Impact of Nanotechnology on Battlefield Welfare: A Study. *International Journal of Nanobiotechnology*. 2024; 10(2): 19– 32p.
- [118].Sultanbanu Sayyad Liyakat, (2024q). Nanotechnology in Healthcare Applications: A Study. *International Journal of Nanobiotechnology*. 2024; 10(2): 48–58p.
- [119].Kazi Kutubuddin Sayyad Liyakat (2024). A Study on AI-driven IoT (AIIoT) based Decision Making: KSK Approach in Robot for Medical Applications, *Recent Trends in Semiconductor and Sensor Technology*, 1(3), 1-17. Available at: <https://matjournals.net/engineering/index.php/RTSST/article/view/1044>
- [120].Kazi Kutubuddin Sayyad Liyakat (2024). Wireless Train Collision Avoidance System, *Advance Research in Communication Engineering and its Innovations*, 1(3), 16-25.
- [121].Kazi Kutubuddin Sayyad Liyakat. (2024). Internet of Battlefield Things: An IoBT-inspired Battlefield of Tomorrow. *Journal of Telecommunication, Switching Systems and Networks*. 2024; 11(3): 11–19p.
- [122].Sunil B. Mishra (2024d). AI-Driven-IoT (AIIoT)-Based Decision Making in Manufacturing Processes in Mechanical Engineering, *Journal of Mechanical Robotics*, 9(2), 27-38.
- [123].Sunil B. Mishra (2024e). AI-Driven-IoT (AIIoT) Based Decision-Making in Molten Metal Processing, *Journal of Industrial Mechanics*, 9(2), 45-56.
- [124].Kazi Kutubuddin Sayyad Liyakat, Impact of Nanotechnology on Battlefield Welfare: A Study. *International journal of Nanobiotechnology*. 2024; 10(02): 19-32p.
- [125].Kazi Sultanbanu Sayyad Liyakat and Kazi Kutubuddin Sayyad Liyakat, Nanosensors in Agriculture Field: A Study. *International Journal of Applied Nanotechnology*. 2024; 10(02): 12-22p. Available from: <https://journalspub.com/publication/ijan-v10i02-11625/>
- [126].Kazi Kutubuddin Sayyad Liyakat, Nanotechnology in Space Study. *International Journal of Applied Nanotechnology*. 2024; 10(02): 39-46p. Available from: <https://journalspub.com/publication/ijan-v10i02-11616/>
- [127].Dr. Kazi Kutubuddin Sayyad Liyakat. (2024). KSK Approach to Smart Agriculture: Utilizing AI-Driven Internet of Things (AI IoT). *Journal of Microcontroller Engineering and Applications*. 2024; 11(03):21-32.
- [128].Kazi Kutubuddin Sayyad Liyakat. (2024). Microwave Communication in the Internet of Things: A Study. *Journal of RF and Microwave Communication Technologies*, 38–49. Retrieved from <https://matjournals.net/engineering/index.php/JoRFMCT/article/view/1276>
- [129].Kazi Kutubuddin Sayyad Liyakat, (2023). Nanorobotics: A Review, *International Journal of Applied Nanotechnology (IJAN)*, 9(2), pp. 36 – 43. DOI: <https://doi.org/10.37628/ijan.v9i2.1019>



- [130].Dr. Kazi Kutubuddin Sayyad Liyakat. Sensor and IoT centered Smart Agriculture by NodeMCU. Recent Trends in Sensor Research & Technology. 2024; 11(03):24-32. Available from: <https://journals.stmjournals.com/rtsrt/article=2024/view=179744>
- [131].Kazi Kutubuddin Sayyad Liyakat.(2024). Carbon based Supercapacitor for Electric Vehicles. Journal of Nanoscience, NanoEngineering & Applications. 2024; 14(03):01-11. Available from: <https://journals.stmjournals.com/jonsnea/article=2024/view=179371>.
- [132].G M Kosgiker. Satellite Sensing for Sea Level Monitoring: A Transformative Approach to Understanding Climate Change. *Journal of Microwave Engineering & Technologies*. 2025; 12(1): 33–41p.
- [133].Kazi Kutubuddin Sayyad Liyakat. Transforming IoT Connectivity Through VLSI Technology. International Journal of VLSI Circuit Design & Technology. 2024; 02(02):1-11. Available from: <https://journals.stmjournals.com/ijvcdt/article=2024/view=190803>
- [134].Kazi Kutubuddin Sayyad Liyakat, “Internet of Robotics Things in Industrial Applications: A Study,” Journal of Control and Instrumentation Engineering, vol. 11, no. 1, pp. 1-10, Feb 2025.
- [135].Kazi Kutubuddin Sayyad Liyakat. Fake Cryptocurrency Detection using Python. Recent Trends in Programming Languages. 2025; 12(1): 1–7p.
- [136].Kazi Kutubuddin Sayyad Liyakat. The Future is Smelling: Exploring the Potential of e-Nose. Journal of Semiconductor Devices and Circuits. 2025; 12(1): 16–27p.
- [137].Sultanabanu Sayyad Liyakat. (2025). Quantum Key Distribution in Optical Fiber Communication: A Study. *Trends in Opto-electro & Optical Communication*. 2025; 15(1): 30–40p.
- [138].Sayyad Liyakat. Fake Cryptocurrency Detection Using Python. Recent Trends in Programming languages. 2025; 12(01):1-7. Available from: <https://journals.stmjournals.com/rtpl/article=2025/view=201421>
- [139].Kutubuddin, KSK Approach in LOVE Health: AI-Driven- IoT(AIIoT) based Decision Making System in LOVE Health for Loved One, *GRENZE International Journal of Engineering and Technology*, 2025, 11(1), pp. 4628-4635. Grenze ID: 01.GIJET.11.1.371\_1
- [140].Kazi Kutubuddin Sayyad Liyakat. TensorFlow- Based Big Data Analytics for IoT Networks: A Study. *International Journal of Data Structure Studies*. 2025; 3(1): 32–40p.
- [141].Kazi Kutubuddin Sayyad Liyakat. Brand Protection Using Machine Learning: A New Era. *E-Commerce for Future & Trends*. 2025; 12(1): 33-44p.
- [142].Dhanve and Liyakat, "Machine Learning Forges a New Future for Metal Processing: A Study," International Journal of Artificial Intelligence in Mechanical Engineering, vol. 1, no. 1, pp. 1-12, Mar. 2025.
- [143].Kutubuddin Sayyad Liyakat. e-Skin Applications in Healthcare and Robotics: A Study. Journal of Advancements in Robotics. 2025; 12(1):13 –21p.
- [144].Kutubuddin Sayyad Liyakat. Millimeter Wave in Internet of Things Connectivity: A Study. *International Journal of Wireless Security and Networks*. 2025; 03(01):13-23.
- [145].Kutubuddin Sayyad Liyakat. TensorFlow-Based Big Data Analytics for IoT Networks: A Study. *International Journal of Data Structure Studies*. 2025; 03(01):31-38.
- [146].Kutubuddin Sayyad Liyakat. Multimedia Technology in Healthcare: A Study. Journal of Multimedia Technology & Recent Advancements. 2025; 12(01):23-29.
- [147].Jatin M. Patil, “Robotic Surgery using AI-Driven-IoT Based Decision Making for Safety: A Study” *International Journal of Artificial Intelligence of Things (AIoT) in Communication Industry*, vol. 1, no. 1, pp. 35-44, Mar. 2025.
- [148].K. K. S. Liyakat,(2025). VHDL Programming for Secure True Random Number Generators in IoT Security, *Research & Review: Electronics and Communication Engineering*, vol. 2, no. 1, pp. 38-47, Mar. 2025.
- [149].Kazi Kutubuddin Sayyad Liyakat. E-Comers and AI: Product Recommendation and Pricing. *Journal of Artificial Intelligence Research & Advances*. 2025; 12(2): 44–52p.



- [150].Jatin M Patil, Velapure and Khadake Suhas B. The Intersection of Nanotechnology and IoT: New Era of Connectivity. *International Journal of Applied Nanotechnology*. 2025; 11(01): 9-17p.
- [151].KKS Liyakat, (2025). Nanorobotics in Cancer Treatment: A Study. *International Journal of Nanomaterials and Nanostructures*. 2025; 11(1): 44-52p. Available from:<https://journalspub.com/publication/ijnn/article=16043>
- [152].KKS Liyakat. (2025). Nanomaterial and e-Skin Technology: A Study. *International Journal of Nanobiotechnology*. 2025; 11(1): 10–16p.
- [153].N. R. Mulla and K. K. S. Liyakat, (2025). Pipeline Pressure and Flow Rate Monitoring Using IoT Sensors and ML Algorithms to Detect Leakages, *Int. J. Artif. Intell. Mech. Eng.*, vol. 1, no. 1, pp. 20–30, Jun. 2025.
- [154].Nikat Rajak Mulla, (2025). Sensor-based Aircraft Wings Design Using Airflow Analysis, *International Journal of Image Processing and Smart Sensors*, vol. 1, no. 1, pp. 55-65, Jun. 2025.
- [155].N. R. Mulla and K. K. S. Liyakat, (2025). A Study on Machine Learning for Metal Processing: A New Future, *International Journal of Machine Design and Technology*, vol. 1, no. 1, pp. 56–69, Jun. 2025.
- [156].N. R. Mulla, and K. K. S. Liyakat, “Node MCU and IoT Centered Smart Logistics,” *International Journal of Emerging IoT Technologies in Smart Electronics and Communication*, vol. 1, no. 1, pp. 20-36, Jun-2025.
- [157].Renuka Dnyanoba Todakar, Jadhav Vaibhavi Kishor. (2025). Kinetic Power Gyms for Revolutionizing Fitness. *Journal of Telecommunication, Switching Systems and Networks*. 2025; 12(02):13-21. Available from: <https://journals.stmjournals.com/jotssn/article=2025/view=214971>
- [158].Kazi Kutubuddin Sayyad Liyakat. Cardiovascular Modeling with Computational and Mathematical Methods. *Research & Reviews: A Journal of Bioinformatics*. 2025; 12(2): 1–11p.
- [159].Nikat Rajak Mulla, Kazi Kutubuddin Sayyad Liyakat. Air Flow Analysis in Sensor-Based Aircraft Wings Design. *Recent Trends in Fluid Mechanics*. 2025; 12(2): 29– 39p.
- [160].Nikat Rajak Mulla, Kazi Kutubuddin Sayyad Liyakat. IoT Sensors To Monitor Pipeline Pressure and Flow Rate Combined with ML-Algorithms to Detect Leakages. *Recent Trends in Fluid Mechanics*. 2025; 12(2): 40–48p.
- [161].Heena Rafiq Shaik, Kazi Kutubuddin Sayyad Liyakat. Juncture of Nanotechnology and IoT: Novel Era of Connectivity. *Nano Trends – A Journal of Nano Technology & Its Applications*. 2025; 27(03):- . Available from: <https://journals.stmjournals.com/nts/article=2025/view=212921>
- [162].Kazi Kutubuddin Sayyad Liyakat. Machine Learning Revolutionizing Server Management and Performance. *Journal of Computer Technology & Applications*. 2025; 16(02):- . Available from: <https://journals.stmjournals.com/jocta/article=2025/view=0>
- [163].Kazi Kutubuddin Sayyad Liyakat. KVS Approach for IoT Network Security: A Novel Approach to IoT Network Security With B-Cell Inspired Models. *Journal of Network security*. 2025; 13(02):16-25. Available from: <https://journals.stmjournals.com/jons/article=2025/view=207920>
- [164].Dr. Kazi Kutubuddin Sayyad Liyakat. Nanotechnology: Effective Pesticide Solutions for Jawar Leaf Diseases. *Journal of Nanoscience, NanoEngineering & Applications*. 2025; 15(02):- . Available from: <https://journals.stmjournals.com/jonsnea/article=2025/view=204242>
- [165].Parkhe Suyash Swaminath, Dhyavarkonda Udaykiran Tulshidas, Todkar Renuka Dnyanoba, Pawar Radhika Maruti, Kazi Kutubuddin Sayyad Liyakat. Nanotechnology in Internet of Things: A Powerful Partnership Shaping the Future. *Journal of Nanoscience, NanoEngineering & Applications*. 2025; 15(02):- . Available from: <https://journals.stmjournals.com/jonsnea/article=2025/view=211534>
- [166].Nikat Rajak Mulla, Kazi Kutubuddin Sayyad Liyakat. Nano-Materials in Vaccine Formation and Chemical Formulae’s for Vaccination. *Journal of Nanoscience, NanoEngineering & Applications*. 2025; 15(03):- . Available from: <https://journals.stmjournals.com/jonsnea/article=2025/view=216526>
- [167].K. Mulani, H. T. Shaikh, and K. K. S. Liyakat, (2025). Nuclear Power Generation Using UO<sub>2</sub> Materials, *Journal of Advance Electrical Engineering and Devices*, Vol. 3, No. 2, pp. 27-40, Jul. 2025.



- [168].H. T. Shaikh and K. K. S. Liyakat, "Empowering the IoT: The Study on Role of Wireless Charging Technologies," *Journal of Control and Instrumentation Engineering*, vol. 11, no. 2, pp. 29-39, Jul. 2025.
- [169].H. T. Shaikh, and K. K. S. Liyakat, "Pre-Detection Systems Transfiguring Intoxication and Smoking Using Sensor and AI," *Journal of Instrumentation and Innovation Sciences*, vol. 10, no. 2, pp. 19-31, Jul. 2025.
- [170].Vaishnavi Ashok Desai, (2025). AI and Sensor Systems Revolutionizing Intoxication and Smoking Pre-Detection. *Journal of Control & Instrumentation*. 2025; 16(3): 15–26p.
- [171].Heena Tajoddin Shaikh. (2025). The Future of Coastal Resilience: Harnessing Satellite Technology. *Advance Research in Communication Engineering and Its Innovations*, 28–36. Retrieved from <https://matjournals.net/engineering/index.php/ARCEI/article/view/2281>
- [172].H. T. Shaikh and K. K. S. Liyakat., (2025). Sensor- based Intelligent Wearable Glasses, *Journal of Digital Circuitry Innovations in Electrical Devices*, vol. 1, no. 2, pp. 16-24, Jul. 2025.
- [173].Kazi Kutubuddin Sayyad Liyakat. Nanorobots: The Fight against Cholesterol. *Nano Trends – A Journal of Nano Technology & Its Applications*. 2025; 27(02). Available from: <https://journals.stmjournals.com/nts/article=2025/view=205244>
- [174].H. T. Shaikh and K. K. S. Liyakat, "Millimetre Wave: A Study on the Backbone of Future IoT Connectivity", *Advance Research in Analog and Digital Communications*, Vol. 2, no. 2, pp. 20-31, Aug. 2025.
- [175].Ayesha Khalil Mulani. Microwave Signals: A New Frontier in Non-Invasive Medical Diagnostics: A Study. *Journal of Microwave Engineering & Technologies*. 2025; 12(3): 27–41p.
- [176].Ayesha Khalil Mulani. Revolutionizing Optical Fibre Field Distribution with Linear Finite Element Method. *Trends in Opto-electro & Optical Communication*. 2025; 15(3): 31-41p.
- [177].H. T. Shaikh and K. K. S. Liyakat, (2025). Robust Access Control Mechanisms in IoT Security using VHDL Programming, *Journal of VLSI Design and Signal Processing*, vol. 11, no. 2, pp. 31-40, Aug. 2025. Available at: <https://matjournals.net/engineering/index.php/JOVDSP/article/view/2351>
- [178].Radhika Maruti Pawar, Kulkarni Amarja Bhaskar, Patu Shradha Gangadhar, Sensors and Artificial Intelligence based Intelligent Thermos. *Recent Trends in Sensor Research & Technology*. 2025; 12(3): 37–45p.
- [179].Ayesha Khalil Mulani. Optical Fibre Pressure Sensor in Medicine: A Study. *Recent Trends in Sensor Research & Technology*. 2025; 12(3): 18–27p.
- [180].Vaishnavi Ashok Desai, Heena Tajoddin Shaikh, Sensor and AI Based Pre- Detection Systems Transfiguring Intoxication & Smoking. *Journal of Telecommunication, Switching Systems and Networks*. 2025; 12(3): 37–50p.
- [181].C. M. Abhangrao and K. K. S. Liyakat, "A study on hybrid intelligence in COBOT," *Journal of Mechanical Robotics*, vol. 10, no. 2, pp. 15–29, Sep. 2025.
- [182].Heena Tajoddin Shaikh, (2025). The Future of Cancer Management: A Guide to Nanosensor Applications. *Recent Trends in Semiconductor and Sensor Technology*, 1–10.
- [183].Heena T Shaikh. A Study on Automatic Feedback Control by Image Processing for Mixing Solutions in a Microfluidic Device. *International Journal of Advanced Control and System Engineering*. 2025; 3(2): 32–41p.
- [184].Heena T Shaikh. A Study on Unmanned Air Vehicles (UAV). *Journal of Aerospace Engineering & Technology*. 2025; 15(3): 14–27p.
- [185].Nikat Rajak Mulla. Nanomaterials in Vaccine Formation and Chemical Formulae for Vaccination. *Journal of Nanoscience, Nanoengineering & Applications*. 2025; 15(3): 1–12p.
- [186].K. K. S. Liyakat, "Waste-to-Energy (WtE) Plants: A Study," *Journal of Alternative and Renewable Energy Sources*, vol. 11, no. 3, pp. 1-15, Oct. 2025.
- [187].Sultanabanu Sayyad Liyakat. (2024). Advancing IoT Connectivity through Very Large-Scale Integration of Semiconductor Technology. *Journal of Semiconductor Devices and Circuits*. 2024; 11(03):54-63. Available at: <https://journals.stmjournals.com/josdc/article=2024/view=190467/>



- [188].Dr. Kazi Kutubuddin Sayyad Liyakat. Sensor and IoT centered Smart Agriculture by NodeMCU. Recent Trends in Sensor Research & Technology. 2024; 11(03): 24-32. Available from: <https://journals.stmjournals.com/rtsrt/article=2024/view=0>
- [189].Dr. Kazi Kutubuddin Sayyad Liyakat. KSK Approach to Smart Agriculture: Utilizing AI-Driven Internet of Things (AI IoT). Journal of Microcontroller Engineering and Applications. 2024; 11(03): 41-50. Available from: <https://journals.stmjournals.com/jomea/article=2024/view=0>
- [190].Pathan Muskan Ibrahim.(2025). Photochemical Materials for Light-Responsive Optical Switching: AI-Optimized Design of Dynamic Visual Effects. International Journal of Photochemistry and Photochemical Research, Volume 3, Issue 2. 2025; 3(2): 13–27p.
- [191].Shaikh A. Hakim A. Razzaque. (2025). A Study on AI-Enhanced Environmental Toxicology: Sensor-Driven Predictive Framework. Research & Reviews: A Journal of Toxicology. 2025; 15(3): 1–20p.
- [192].Paul Pranit Sunil, Dhyvarkonda Udaykiran Tulshidas, Gone Yashasvi Prakash. (2025). AI-Powered Motorcycle Anti-Theft and Safety System, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 1, October 2025. pp. 445- 454.
- [193].P. M. Ibrahim and K. K. S. Liyakat, “Guardian Angel: An Innovative Mobile Application for Rapid Accident Notification and Emergency Response,” *Advance Research in Analog and Digital Communications*, vol. 2, no. 3, pp. 7-20, Oct. 2025.
- [194].Muskan Ibrahim, Shaikh A. Hakim A. Razzaque, Heena T Shaikh, Kazi. (2025). VHDL-Based Strategies for Protecting IoT Devices from Power and Electromagnetic Side-Channel Attacks: A Study. *Recent Trends in Electronics & Communication Systems*. 2025; 12(3): 30–40p. Available at: <https://journals.stmjournals.com/article/article=2025/view=234151/>
- [195].Amar Parmeshwar Bansode, (2025). Electronics and Communication Design of an AI-Powered Smart Chair for Real-Time Multilingual Interaction. *Recent Trends in Electronics & Communication Systems*. 2025; 12(3): 16–29p

