

swatah.ai

Empowering the Future with Sensory Intelligence

Predictive Maintenance In IIoT 4.0

Using Acoustic and Vibration Classification

Leveraging AI for Enhanced Operational Efficiency



swatah.ai
INSPIRING INTELLIGENCE

Introduction to IIoT 4.0



Definition

Integration of industrial machinery with smart sensors and software.



Key Features

- Interconnected systems.
- Real-time data analytics.
- Automation and smart manufacturing.



Business Value

- Enhanced efficiency.
- Cost reduction.
- Improved decision-making.



Predictive Maintenance



Definition

Maintenance strategy that predicts failures before they occur.



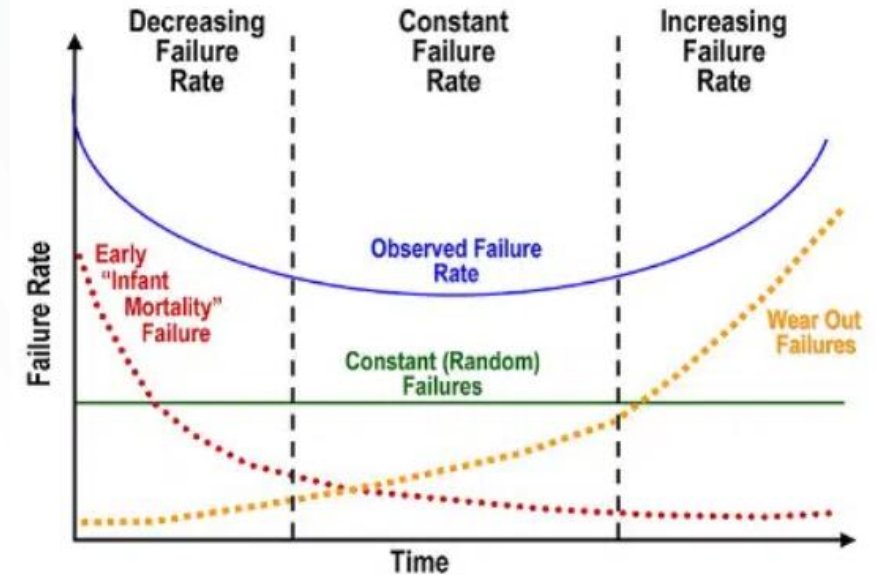
Benefits

- Minimizes downtime.
- Reduces maintenance costs.
- Extends equipment lifespan.



Comparison

- Reactive Maintenance (fix after failure).
- Preventive Maintenance (scheduled fixes).



Reference, Accessed 31/07/2024

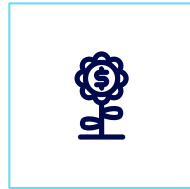


Role of Acoustic and Vibration Analysis



Introduction

Techniques to monitor equipment health.



Types of Data Collected

- Vibration signatures.
- Sound patterns.



Equipment Monitored

- Motors.
- Pumps.
- Bearings.

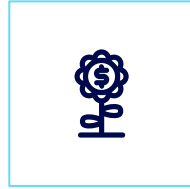


Technology and Tools



Types of Sensors

- Accelerometers
- Microphones
- Ultrasonic sensors



Data Acquisition

- High-fidelity data recording.
- Real-time data transmission.



Data Quality

- Very important aspect.
- Accurate fault detection.
- Reliable Maintenance Predictions.



Integration with IIoT 4.0



Integration Points

- Continuous monitoring.
- Wireless communication.



Use of Cloud and Edge Computing:

- Neural networks.
- Support Vector Machines (SVM).



Benefits

- Imbalance.
- Misalignment.
- Bearing faults.



Data Processing and Classification



Data Collection and Transmission

- Continuous monitoring.
- Wireless communication.



Machine Learning Algorithms

- Neural networks.
- Support Vector Machines (SVM).



Examples of Faults Detected

- Imbalance.
- Misalignment.
- Bearing faults.



Challenges and Considerations



Implementation Challenges

- Data management.
- Cybersecurity risks.
- Privacy concerns.



Technology Selection

- Choosing appropriate sensors and software.



Continuous Monitoring

- Need for regular updates and calibrations.



swatah.ai ADVANTAGE



Zero Learning

- Full pipeline development.
- Zero involvement after pilot phase.
- Automatic and on-demand OTA update scheduling.



Continuous Improvement

- Random real life data feedback to augment AI/ML.

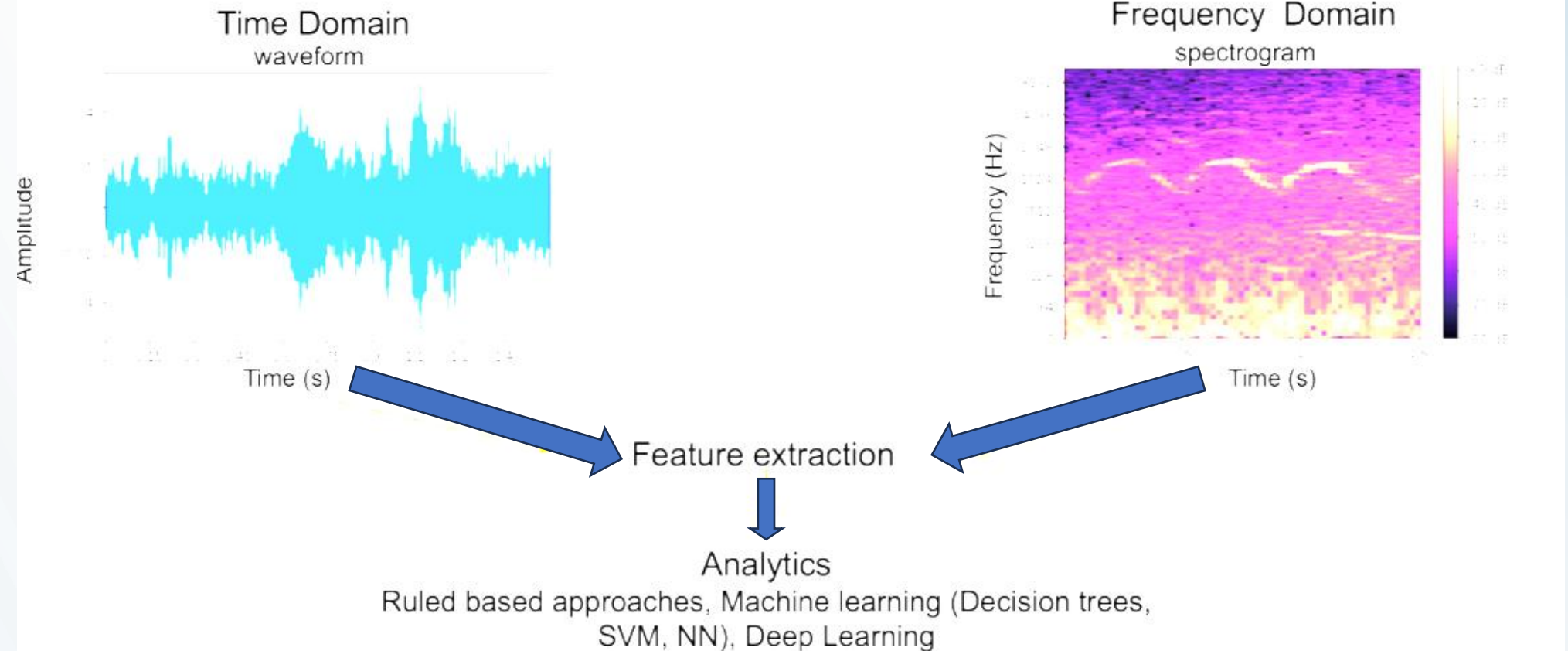


Risk Mitigation

- Edge based deployment.
- Reduced Cloud access.
- Sit inside your IT framework.



Inhouse AI/ML Training



Reference Accessed 31/07/2024



swatah.ai
INSPIRING INTELLIGENCE

Advantages for Factories



Increased Operational Efficiency

- Real-time monitoring of equipment health.
- Reduced downtime through predictive maintenance.



Cost Savings

- Lower maintenance costs by preventing unexpected failures.
- Optimized use of resources and energy.



Improved Decision-Making

- Data-driven insights for better planning and operations.
- Enhanced ability to schedule maintenance without disrupting production.



Enhanced Safety

- Early detection of potential hazards.
- Enhanced reliability and performance of motors.



Advantages for Manufacturers



Product Improvement

- Feedback from real-world usage to refine product designs.
- Enhanced reliability and performance of motors.



Competitive Advantage

- Standing out in the market with advanced, smart products.
- Ability to offer comprehensive solutions that integrate with IIoT systems.



Customer Satisfaction

- Providing customers with robust, dependable products.
- Offering value-added services such as condition monitoring.



New Revenue Streams

- Selling predictive maintenance as a service.
- Providing long-term maintenance contracts.



Future Trends



Emerging Technologies

- AI advancements in predictive maintenance
- Improved sensor capabilities



Trends

- Deeper integration with IIoT.
- More automation in maintenance processes.



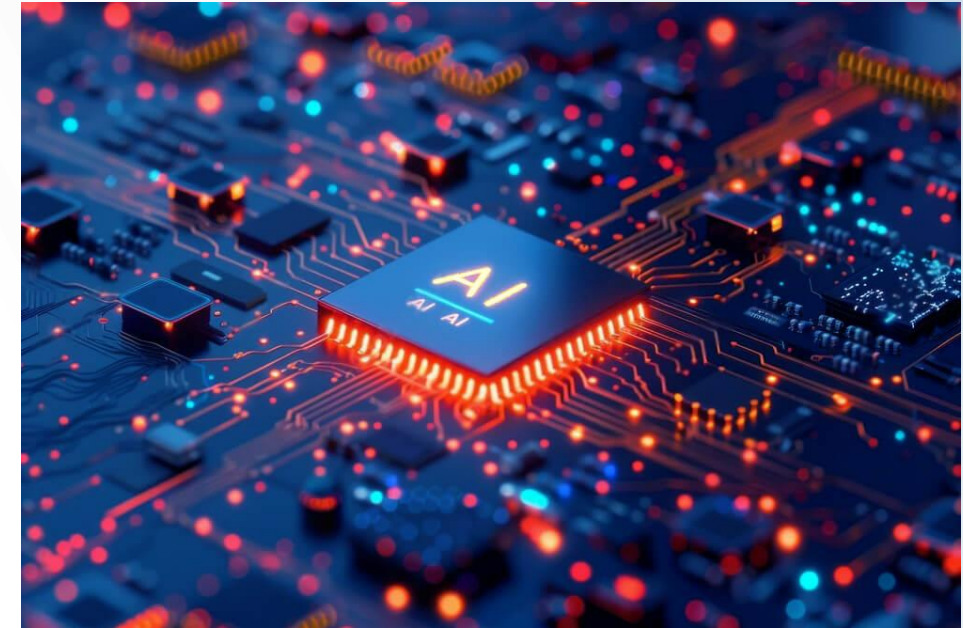
Future Impact

- Transforming industries.
- Greater operational efficiencies.



Why Choose swatah.ai?

- Cutting-edge AI-powered hardware and solutions.
- Specialization in computer vision and acoustics.
- Custom, scalable solutions for industry needs.
- Seamless integration and expert team support.
- Community initiatives to promote AI access.
- In-House Hardware Production: Ability to customize hardware for specific AI applications ensures better integration and optimization.
- Cost Efficient with improved reliability and performance .
- Innovative Solutions - Potential for unique, proprietary technology.



Or Locations



UK

Europe Business Development



Pune, India

Head Office



Indore, India

Business Development



swatah.ai
INSPIRING INTELLIGENCE

Thanks

Do you have any questions?

info@swatah.ai

+44 73113 88917 / +91 77710 77733

+44 78591 37272 / +91 63544 05154

swatah.ai



swatah.ai
INSPIRING INTELLIGENCE