Functional Requirements

IEEE: 3.2 | ISO: Functionality

- Develop AI-powered solutions for real-time health data analysis and predictive analytics
- Design and deploy machine learning models for defect detection in PCB manufacturing
- Engineer IoT-based automation systems for real-time infrastructure monitoring
- Develop CNN-based AI models for ovarian cancer detection
- Build AI-driven real-time health monitoring systems for predictive analytics
- Integrate TensorFlow Serving and Flask API for scalable real-time deployment
- Implement Explainable AI (SHAP, Grad-CAM) for diagnostic transparency
- Optimize model performance with hyperparameter tuning and data augmentation

Non-Functional Requirements

IEEE: 3.3 | ISO: Usability

- Ensure scalability and efficiency in AI-powered solutions
- Improve accuracy and production efficiency in machine learning models
- Enhance operational efficiency and optimize resource utilization in IoT-based automation systems
- Achieve high accuracy (88%, 89%, 90%) in AI models for ovarian cancer detection, PCB defect detection, and smart health monitoring
- Ensure real-time deployment and scalability in AI-driven health monitoring systems

Business Rules

IEEE: N/A | ISO: N/A

- Use TensorFlow, Keras, and OpenCV for AI model development
- Implement data augmentation and hyperparameter tuning for model optimization
- Use MQTT for real-time infrastructure monitoring
- Integrate Flask API for scalable real-time deployment
- Use AWS and Oracle Cloud for cloud deployment and management

Constraints

IEEE: 3.4 | ISO: Portability

- Limited availability of resources (infrastructure, personnel) for IoT-based automation systems
- Complexity in integrating multiple technologies (TensorFlow, Keras, OpenCV, Flask, MQTT) for AI-driven solutions
- Need for high accuracy (88%, 89%, 90%) for reliable decision-making
- Limited availability of data for model training and testing

Assumptions

IEEE: 3.5 | ISO: Maintainability

- Availability of necessary infrastructure and resources for AI-powered solutions
- Availability of expertise in AI, machine learning, and IoT
- Availability of necessary data for model training and testing
- Compatibility of technologies (TensorFlow, Keras, OpenCV, Flask, MQTT) for integration