STATATHON 2025

AI-Powered Secure Edge Server for Survey Data

- **Problem Statement ID:** 1
- **Problem Statement Title:** AI-Powered Secure Edge Server for Survey Data
- **PS Category :** Software + hardware
- **Team ID:** 3827
- **Team Name :** Echoes of Arthur

Echoes of Arthur

AI-Powered Secure Edge Server for Survey Data

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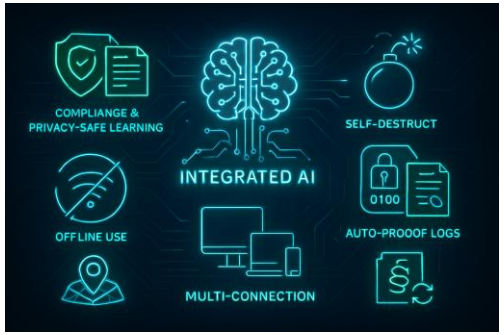
Solution Overview 🔍

- **Security:** Rugged, biometric, AI threat detection, instant wipe, encrypted, offline.
- **Privacy:** Anonymization, secure logs, location tagging.
- **Access Control:** Location-based use, encrypted backups.



Innovation and Differentiators 🚀

- **AI & Security:** Integrated AI, compliance, privacy-safe learning.
- **Protection:** Self-destruct, tamper-proof logs, location-based access.
- **Connectivity & Updates:** Offline use, multi-connection, auto law updates.

Problem Mitigation 🛡️

- **Data Safety:** On-site protection, offline use, theft resistance.
- **Access Control:** Blocks unauthorized use, quick threat detection.
- **Reliability:** Law compliance, backups, reduced false alarms.

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TECHNICAL APPROACH

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Technologies Utilized

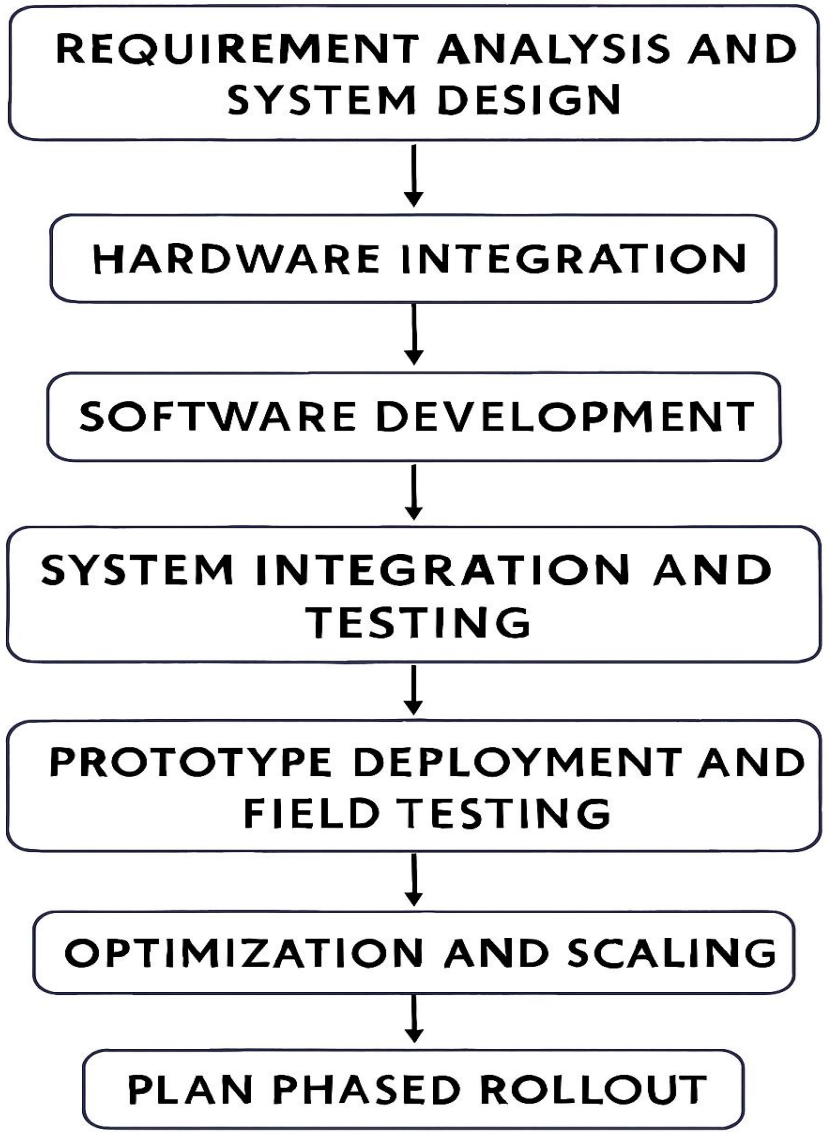
Hardware

- Strong micro-server
- Tamper-detection sensors
- Fingerprint/face scanners
- GPS tracking
- Backup battery
- 4G/5G & satellite communication

Software

- C/C++ for programming devices
- Python for AI features
- Solidity for blockchain contracts
- TensorFlow Lite for AI on small devices
- OpenSSL for secure data
- Hyperledger Fabric for blockchain management
- Linux/RTOS for device operation

Methodology->



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FEASIBILITY AND VIABILITY

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1.Feasibility Analysis 📈

- **Integration:** Smooth hardware connectivity.
- **Efficiency:** Long battery life, stable internet.
- **Security & Scalability:** Data protection, easy blockchain setup.

2. Potential Challenges & Risks 🚧

- **Compatibility:** Hardware integration issues.
- **Efficiency:** Battery limits, network stability.
- **Security & Complexity:** Data protection, blockchain setup.

3.Strategies to Overcome Challenges 🧠

- **Optimization:** Early hardware testing, power-efficient software
- **Connectivity:** Multi-network options (4G, satellite).
- **Security & Scaling:** Strong protection, phased blockchain rollout

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🌍 IMPACT AND BENEFITS

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1.Potential Impact 💥

- **Security:** On-site protection, law compliance.
- **Efficiency:** Time-saving, quick issue detection.
- **Reliability:** Builds trust, works in all locations.

2. Benefits of the Solution 📈

- **Security:** Local protection, AI threat detection, secure logs
- **Usability:** Biometric access, offline operation.
- **Cost-Efficiency:** Affordable parts, simple design.

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RESEARCH AND REFERENCES

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1.Menon, U. Vivek, Vinoth Babu Kumaravelu, C. Vinoth Kumar, A. Rammohan, Sunil Chinnadurai, Rajeshkumar Venkatesan, Han Hai, and Poongundran Selvaprabhu. "AI-powered IoT: A survey on integrating artificial intelligence with IoT for enhanced security, efficiency, and smart applications." *IEEE Access* (2025).

2.Pham-Quoc, Cuong. "FPGA/AI-powered data security for IoT edge computing platforms: a survey and open issues." In *International Conference on Intelligence of Things*, pp. 3-14. Cham: Springer Nature Switzerland, 2023.

3.Banerjee, Aurgho. "Securing the Future: AI-Driven Data Transmission in IoT-Powered Smart Cities." *Soft Computing Fusion with Applications* 2, no. 1 (2025): 33-53

4.Gaddam, Narayana. "AI-Powered Data Masking for Privacy-Preserving Cloud Data Sharing." *International Journal of Advanced Research in Cloud Computing* 5, no. 2 (2024): 12-22.

5.Pham-Quoc, Cuong. "FPGA/AI-Powered Data Security for IoT." In *Intelligence of Things: Technologies and Applications: The Second International Conference on Intelligence of Things (ICIT 2023), Ho Chi Minh City, Vietnam, October 25-27, 2023, Proceedings, Volume 1*, vol. 187, p. 3. Springer Nature, 2023.