Abstract

Title: An Ultra-Lightweight, Offline AI Architecture for Humanitarian and Resource-Limited Environments

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This paper presents a novel approach to artificial intelligence design in the form of a fully self-contained, 54KB HTML file that embeds three traditional AI engines—k-Nearest Neighbors (k-NN), Recursive Least Squares (RLS), and Thompson Sampling—entirely offline. The system is designed to operate without internet, servers, or cloud access, making it deployable in extreme low-resource environments such as refugee camps, disaster zones, and remote regions lacking stable electricity.

Unlike cloud-based models dependent on vast datasets and centralized computation, this AI architecture operates locally in a browser using only device memory. It collects no personal data and is structurally aligned with GDPR, UNCRC, and CRPD standards, enabling ethical deployment in sensitive humanitarian settings. Every vector, weight update, and decision path is explicitly exposed, offering full explainability and transparency, thus contributing a “minimal transparent model” to the field of Explainable AI (XAI).

This model introduces a new research axis for AI: ultra-lightweight, fully auditable, privacy-preserving, and community-maintainable systems. It opens research directions in embedded AI, decentralized AI governance, and sovereign technology infrastructure. We propose that this architecture is not merely a technical curiosity but a practical, scalable tool for real-world humanitarian protection—proving that AI can be small, ethical, and life-saving

Why This Is a New Paradigm AI

as a Single Document

Traditional AI depends on massive cloud servers and huge datasets. Here, the AI is compressed into a single 54KB HTML file. The file itself is the engine, not just an interface.

Execution Without Servers or Internet

Most AI systems fail without connectivity. This design runs entirely in a browser, with no network calls at all. It functions during blackouts, wars, or censorship—domains where mainstream AI is unusable.

Ethics by Design, Not as an Add-On

Unlike data-hungry AI models, this system collects no personal data. It is structurally aligned with GDPR, UNCRC, and CRPD, proving that 'AI without surveillance' can exist.

Field-Ready and Community-Driven

Refugee camps, disaster zones, and low-infrastructure states cannot depend on data centers. By turning discarded smartphones into self- sustaining alert nodes, local communities can operate and maintain AI themselves.

Extreme Lightweight with Full Transparency

While modern AI is often opaque, this system exposes every vector, similarity measure, and weight update in code. It is simultaneously ultra- lightweight and fully explainable—a combination rarely seen in AI research.

In short, this project is not merely a 'smaller AI,' but a redefinition of what AI can be: lightweight, offline, ethical, transparent, and field-sustainable. That is why it deserves to be called a new paradigm.

Founder: Gyumin Jeon (English name: Morgan J) https://mcorpai.org/

This initiative is provided free of charge and operates through an ultra- lightweight, data-free, fully offline architecture as an ethical form of artificial intelligence. Its purpose is not to harvest data, but rather to embody a technology grounded in human judgment, responsibility, and ethical principles.

For your reference, the document includes three AI engines.

A Single Image in Size — Yet Containing Three Full AI Engines

The **54KB Offline AI** is no larger than a single image file.
Yet inside this tiny HTML document reside **three distinct AI engines**,
each operating **fully offline** and **without any need for servers or internet**.

The Three Embedded AI Engines:

1. k-NN AI – “Have we seen something like this before?”
When a new signal is received,
the AI searches past data to ask:
"Which previous cases are most similar?"
This is the **k-Nearest Neighbors algorithm (k-NN)** at work.

2. RLS AI – “Instant adaptation to human feedback”
Whenever field staff **confirm or dismiss an alert**,
the AI immediately adjusts its **internal weights**

based on that feedback.
This is **Recursive Least Squares (RLS)**—a form of real-time, online learning.

3. Thompson Sampling AI – "Probability-driven decisions under uncertainty"
The AI models each country or situation as a **Beta-Bernoulli process**.
As observations accumulate, the posterior distribution is updated.
At each decision point, the AI samples from this distribution to
autonomously determine whether to **explore further** or
issue a warning based on the assessed risk level.
This is the **Thompson Sampling** algorithm.

All of this exists within a **single 54KB HTML file**.
No server. No internet. No cloud infrastructure.
Just one click—and the AI is live.
In war zones, blackouts, or censorship, this engine
thinks, adapts, and protects—entirely on its own.
This is not just a smaller AI.
It is a redefinition of what AI can be:
lightweight, ethical, transparent, and field-ready.