LEVL - Longevity Protocols App - Decentralized Clinical Trials

Company Description:
LEVL is an AI longevity startup targeting the biology of aging to create novel nutraceutical formulations and personalized protocols to help people live longer, healthier lives.

By leveraging the tools of AI drug discovery to identify synergistic combinations of naturally derived ingredients, certain formulations are emerging that rival the potency of comparable pharmaceuticals without the side effects and regulatory timelines of traditional drug development. Our first Patented formulation using this process mimics fasting-induced cellular rejuvenation without the need for caloric restriction, and in our testing is comparable to the leading anti-aging pharmaceutical, Rapamycin.
We are commercializing these breakthroughs under the LIFESPAN+ brand to deliver foundational cellular support, tackling the root causes of age-related decline while providing immediate functional benefits of Energy, Sleep, Focus, Calm, etc.
Our companion app dynamically optimizes personalized longevity protocols based on users' biomarkers and qualitative feedback, effectively slowing their pace of aging.

Students will directly contribute to developing our open-source longevity knowledge graph, powered by the frontier of aging research and anonymized user data, to democratize anti-aging research in pursuit of LEVL's ultimate mission: Achieve Longevity Escape Velocity, and eliminate age-related disease.

Preferred Team Size: 3-5

Location: Remote - With virtual access to the team throughout the entire program

Project Summary:

Objective:

Create a turnkey engine that lets LEVL (and, later, outside researchers) spin-up supplement or behavioral-modality trials inside the everyday LEVL app workflow. The platform must capture IRB-grade data—from baseline through statistical readout—while imposing minimal friction on participants and ensuring strict privacy compliance. Evidence generated here will feed the Synergy Discovery Engine, the Pace-of-Aging Knowledge Graph, and marketing-claim dossiers. At a global scale, this lowers the barrier for proving what truly works in longevity science—accelerating the delivery of safe, evidence-based health innovations to everyone, not just those with access to large clinical centers.

Core Deliverable MVP Enabling Validation of Efficacy for Formulations and Longevity Modalities

- Endpoint Libraries: machine-readable JSON schemas for hallmarks-of-aging assays, cognitive tests, microbiome diversity, and core vitals—each mapped to FTC-compliant structure/function wording

- Trial Management Service: create/read/update/delete APIs for study setup, digital consent, inclusion/exclusion logic, arm randomization, and visit timeline scheduling
- Modality Efficacy Collector: Accept quantitative outcomes (biomarkers, wearable deltas) and qualitative ratings pushed automatically by plugins or entered by users, storing them against trial arms and timepoints
- Qualitative Metric Ingest: accept and store the pre/post 1-to-10 ratings pushed by the Core Platform, linking them to the correct modality, arm, and timepoint in the Modality Efficacy Collector schema.
- Data Validation Pipeline: enforce schema conformity, timestamp integrity, and plausibility ranges; attach SHA-256 lineage hash per record for auditability
- Participant Dashboard: web UI for investigators that shows enrollment flow, adherence curves, adverse-event flags, and dropout attribution in near-real time
- Webhook Integrations: push recruitment nudges to the Core Platform; pull outcome bundles into the Synergy Engine and Longevity Knowledge Graph
- Automated Statistical Report Generator: one-click Jupyter-powered PDF that includes baseline comparability tables, effect sizes, confidence intervals, and p-values
- Audit Log & RBAC: immutable event log plus role tiers (admin, principal investigator, data-scientist, observer) to satisfy GxP traceability requirements
- Blinded Data Export: generate de-identified CSV/JSON snapshots for external statisticians or regulators on demand
- Placebo-Control Capability: randomize participants to active vs. identical-looking placebo arms; support blinding flags and separate data pipelines so analysts remain masked until final unblinding.

The students will be involved in every phase of the project from design through implementation. During the design phase, the students will interact with LEVL researchers to collect requirements and scope the development effort into manageable tasks. They will also gain experience with agile product development in a fast-paced startup environment, using the RICE prioritization framework and collaborating closely with business stakeholders to guide decisions and maximize impact.

Scientific Relevance:

The Digital / Decentralized Clinical Trials Platform converts real-world engagement into robust, publishable evidence. By embedding validated endpoints in normal app use, LEVL can iterate on formulations and behavioral modalities far faster—and at a fraction of the cost—than traditional site-based studies, while still generating data strong enough for regulatory submissions or peer-review.

Stretch Goals:

- Adherence-Based Eligibility Filter: expose a filter that screens candidate participants by the Matching-engine adherence reputation score threshold before randomization.
- Survival analysis visualizations (Kaplan–Meier plots, Cox proportional-hazards models)

- CDISC ODM or HL7 FHIR export for formal regulatory submissions
  Cross-trial meta-analysis module that flags reinforcing or contradictory results across cohorts
- Participant incentive engine (non-cash rewards, badges) tied to adherence milestones
- Long-Term Data Archiving: policy-driven cold-storage that meets GxP and future HIPAA retention guidelines

Desired Skill Set:
Best suited to students who enjoy back-end architecture, data integrity, and light biostatistics. Experience designing REST or GraphQL APIs in a typed language (Python with FastAPI, TypeScript with NestJS, or similar), working with schema-validation libraries, and automating statistical analyses with Pandas/Polars and Jupyter will accelerate progress. Familiarity with role-based-access middleware, cryptographic hashing for audit trails, and PDF or HTML report generation is helpful. Curiosity for clinical-trial methodology and a disciplined approach to logging and testing are essential; specific technologies are flexible as long as the codebase remains clean, typed, and well-documented.

Student Benefits:

1. Hands-on privacy & compliance engineering. Few student projects touch GxP-style audit logs, lineage hashes, or de-identification pipelines. You'll learn the real-world safeguards behind health-tech products and be able to discuss them credibly in interviews.
2. End-to-end product ownership. You'll design APIs, data-pipelines, a web dashboard, and automated stats—all in one coherent system, mirroring the responsibilities of a full-time software engineer rather than a narrow internship task.
3. Enjoy creative freedom to design and solve open-ended, high-impact problems that push the frontiers of human life extension.
4. Each team will ship an independent, modular contribution with clear ownership and a path to public demo or open-source release.
5. Top-performing students may be invited to continue working with LEVL or be referred to partner startups in the healthtech and AI space.
6. Complimentary LIFESPAN+ products to improve sleep, boost energy & focus, and mitigate the effects of stress.

IP Rights:
Students will be asked to sign a proprietary information and intellectual property assignment agreement. Intellectual property rights to all code, data, and documentation will be retained by LEVL, Inc.

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