# Harmonia: Architectural Specification and Design Strategy for the Apex Match System

## 1. Executive Vision: The Paradigm of Scientific Humanism

The contemporary landscape of digital courtship is defined by a crisis of "search friction" and the commodification of human connection. The dominant algorithmic paradigms—collaborative filtering and high-frequency swipe mechanics—have created a marketplace characterized by "decision fatigue," superficial filtering, and a paradox of choice that paradoxically lowers the probability of meaningful pair-bonding.1 Users are reduced to static data points, and the complex, multi-modal nature of attraction is flattened into binary vectors of "Like" or "Pass."

The proposed solution, **Harmonia** (internally referenced as the Apex Match System), represents a radical departure from this gamified model. It posits that attraction is a cumulative probability function of three distinct variables: **Visual Preference (Meta FP)**, **Psychological Resonance (Perceived Similarity)**, and **Biological Compatibility (MHC/HLA Synergy)**.1 Unlike traditional platforms that obscure their mechanisms behind "black box" algorithms, Harmonia is built on the philosophy of **"Quantified Romance."** It utilizes the "Labor Illusion"—a psychological principle suggesting that users ascribe greater value to results when they witness the computational effort behind them 1—to build trust and signal high intent.

However, the defining characteristic of Harmonia is not merely its algorithmic rigor, but its aesthetic and interaction philosophy: **Scientific Humanism**. The interface does not mimic the sterile, clinical look of a laboratory, nor the neon-soaked, dopamine-triggering visuals of a casino-style game. Instead, it adopts the visual language of the **Classical Instrument**. Drawing from the provided design index (index.html), the platform utilizes a palette of **Warm Parchment**, **Mediterranean Blue**, and **Gold Champagne**.1 The typography pairs **Cormorant Garamond** (a humanist serif evoking literary tradition) with **DM Sans** (a geometric modern sans), creating a tension between the romantic ideal and the data-driven reality.

This comprehensive design report serves as the definitive architectural blueprint for the Harmonia platform. It translates the validation logic from the "Harmonia Engine Pilot Study" 1 and the specific operational requirements discussed in technical meetings 1 into a granular UX/UI specification. It is designed to guide the development of a React-based frontend that is not only functional but emotionally resonant, guiding the user through the five critical modules: **Setup**, **Calibration**, **Assessment**, **Analysis**, and **Results**.

### 1.1 The Theoretical Framework: The Tri-Factor Model

The Harmonia architecture is predicated on the sequential integration of three data streams, a methodology known as **Time/Type Matching (TMMA)**. This approach introduces variables in staggered phases to prevent "cross-contamination" (e.g., the Halo Effect of a photo biasing the perception of personality).1 The design must reflect this phased disclosure, treating each module as a distinct stage in a scientific journey.

| **Variable** | **Weight** | **Scientific Basis & Validation Protocol** | **UX/UI Design Implication** |
| --- | --- | --- | --- |
| **Visual Preference (Meta FP)** | **50%** | **The Halo Effect & Transfer Learning:** Attraction is the primary gatekeeper. The system creates a baseline "Face Preference" vector using stock imagery before introducing real profiles.1 | Requires a "Calibration" module (Stage 1) that feels like a curated gallery. The UI must capture implicit signals like "dwell time" and "decision velocity" to refine the vector.1 |
| **Psychometrics (Perceived Similarity)** | **35%** | **Identity Malleability & The "Sins":** Users are attracted to those they *perceive* as similar. The validation study actively manipulates this perception to test if users can be influenced by the algorithm.1 | Utilizes a mandatory "Five-Question Inquiry" and a "Seven Drivers" (Sins) assessment. Visualized as a "Compass Rose" (Radar Chart) to show alignment rather than raw scores.1 |
| **Genetics (HLA / Chemical Spark)** | **10%** | **MHC Dissimilarity:** Biological compatibility based on immune system genes. Validated via a "Placebo vs. Incentive" protocol where some users are told they match even if they don't.1 | Requires a "Biometric Ingestion" interface that treats DNA data with reverence. Visualized as "The Spark" or "Gold Thread"—a high-value indicator of "destiny".1 |
| **Serendipity** | **5%** | **Stochastic Variation:** Accounts for the "Chaos" factor and logistical noise. | Represented as the "Void" or "White Segment" in visualizations, acknowledging the limits of computation.1 |

The interaction design for each of these variables must balance the **Science** (accurate data collection) with the **Suggestion** (the psychological priming that makes the user *believe* in the match).1

## 2. Design System Architecture: The "Harmonia" Aesthetic

The visual identity of Harmonia is critical to its function. In a market saturated with "Dark Mode" cyber-aesthetics and "Clean White" corporate minimalism, Harmonia’s **"Warm Parchment"** theme signals a return to something tangible, permanent, and valuable. It is an interface that feels like it has been written, not just rendered.

### 2.1 Color Theory and Palette Application

The color palette is derived directly from the provided index.html style guide, utilizing CSS variables to ensure consistency across the application.1

* **Primary Background: Warm Parchment (#fbf9f5 to #f5f0e6)**
  + *Psychology:* Evokes the feeling of high-quality paper, manuscripts, or archival documents. It reduces eye strain compared to pure white and creates a sense of intimacy and warmth.
  + *Application:* Used for the main application background and card surfaces. A subtle grain texture (noise) is applied to prevent the "flatness" typical of digital screens, giving the UI a tactile quality.
* **Primary Action & Depth: Mediterranean Blue (#2a4e6c to #1f3b54)**
  + *Psychology:* Represents depth, intellect, stability, and trust. It anchors the ethereal parchment tones and provides a "serious" counterweight to the romance.
  + *Application:* Used for primary buttons, active states, toggle switches, and deep shadows. It replaces standard black for text, softening the contrast while maintaining readability.
* **Accent & Value: Gold Champagne (#d4af37 to #c5a028)**
  + *Psychology:* Represents scarcity, value, and "The Spark." It triggers a sense of luxury and importance.
  + *Application:* Used sparingly for high-value interactions: the "Spark" indicator, successful match notifications, slider "thumbs," and border highlights on active inputs.
* **Functional Alert: Deep Burgundy (#8b0000)**
  + *Psychology:* Represents passion, biology (blood/heart), and error states.
  + *Application:* Used for the "Match" polygon in radar charts (to contrast with the user's Blue) and for critical system alerts.

### 2.2 Typography: The Tension of Old and New

The typographic system creates a deliberate tension between the "Old World" of romantic idealism and the "New World" of data science.1

* **Display / Headings: Cormorant Garamond**
  + *Characteristics:* A distinct display serif with flowing curves and sharp serifs. It feels human, historical, and expressive.
  + *Usage:* All module titles (e.g., "The Calibration"), major questions, and the final "Match Score" percentage. It frames the experience as a narrative.
* **Data / Body: DM Sans**
  + *Characteristics:* A geometric sans-serif with excellent legibility at small sizes. It is objective, modern, and clinical.
  + *Usage:* Input fields, data labels, button text, and instructional copy. It frames the inputs as scientific data points.

### 2.3 Visual Hierarchy and Materiality

The interface utilizes **"Sophisticated Glassmorphism"** to create depth.1 Unlike the "frosted glass" of iOS, Harmonia’s glass effect looks like **Lens Optical Glass** or **Vellum**.

* **The Card Metaphor:** Content is not floating in a void; it rests on "cards" styled as thick, cream-colored stationery (bg-parchment-100).
* **Shadows:** Shadows are not grey. They are tinted with **Mediterranean Blue** (shadow-mediterranean-500/10), creating a rich, atmospheric depth that feels like natural light interacting with ink.
* **Borders:** Borders are hairline thin (1px), often colored in **Gold Champagne** at low opacity (border-champagne-400/30), mimicking the edge of a gilded page or a brass instrument casing.

## 3. Module 1: The Setup (Biometric Ingestion & Onboarding)

The onboarding phase is the user's initiation into the Harmonia protocol. It must immediately differentiate itself from the low-friction, gamified signup flows of Tinder or Hinge. The goal is to establish **High Intent**.1

### 3.1 The "Concierge" Signup Flow

The initial data collection is streamlined but formal. The meeting notes clarify that while the study requires a gender equilibrium (1:1 ratio), this complexity should not block the initial signup.1

* **Layout:** A centered, single-column layout max-width 480px (mobile-first), resembling a formal invitation or a digital dossier.
* **Input Design:**
  + Inputs are styled as **"Underlined Fields"** (border-bottom only) rather than boxed containers. This mimics filling out a paper form.
  + *Interaction:* When focused, the bottom border animates from center-out in **Mediterranean Blue**. The label (DM Sans) floats upward, transitioning to a smaller scale.
* **Data Points:** Name, Email, Password.
* **Gender & Orientation Logic:**
  + The user selects gender via a **Segmented Control** (Sliding Toggle).
  + *Design:* A pill-shaped container with a sliding **Gold** background that moves behind the active text (Male/Female).
  + *Waitlist Logic:* As per Felix's correction 1, the "Waitlist" is **not** for the app account itself, but for the **DNA Testing Kit**. The signup proceeds regardless of gender balance, but the "Kit Request" later in the flow may be gated if the gender quota is full.

### 3.2 The "Mandatory Five" Inquiry

To establish a valid psychometric baseline before any "Sins" or "DNA" data is processed, every user must answer the same **Five Mandatory Questions**.1

* **Selection Logic:** These questions are drawn from five distinct "blocks" of personality traits (e.g., Social Battery, Conflict Style, Ambition).
* **Presentation: The Card Stack.**
  + Each question appears on a solitary card in the center of the screen.
  + *Typography:* The question text is large, set in **Cormorant Garamond**.
  + *Interaction:* The user selects an answer (A or B/C). The card does not "swipe" away playfully. It **dissolves** into gold particles that flow into a progress bar at the bottom, symbolizing the data being "ingested" by the system.
* **Progress Indicator:** A "Fountain Pen" or "Ink Well" progress bar. As the user advances, a line of **Royal Blue Ink** extends across the bottom of the screen.

### 3.3 The Biometric Ingestion Port (HLA Integration)

This is the "Wow" moment of the setup. It bridges the digital and biological worlds. The system must handle two scenarios: users with existing data (23andMe) and users needing a kit.1

* **Visual Metaphor: The Seal.**
  + Instead of a standard "File Upload" box, the component is designed as a circular **"Biometric Seal."**
  + *Resting State:* A dashed circle in **Mediterranean Blue**. Inside, a stylized **Double Helix** icon drawn in a sketch-like style (Da Vinci-esque).
  + *Hover State:* The border becomes solid **Gold Champagne** and pulses gently ("Breathing" animation). The cursor becomes a "DNA" icon.
* **Interaction Physics (The "Labor Illusion"):**
  + When a file (e.g., genome.txt) is dropped onto the Seal:
    - **Phase 1 (Ingestion):** The circle fills with a liquid gold effect (SVG clip-path animation), moving from bottom to top.
    - **Phase 2 (Sequencing):** The UI transitions to a "Processing" state. The text does not say "Uploading..." but uses the specific language from the **HLA Parser Pipeline** 1:
      * *"Detecting File Format (23andMe/Ancestry)..."*
      * *"Parsing Chromosome 6 Region..."*
      * *"Validating 1,000+ SNP Markers..."*
      * *"Imputing HLA-A, B, DRB1 Alleles..."*
    - *Timing:* This sequence is artificially delayed (approx. 3-4 seconds) to ensure the user perceives the complexity of the analysis.1
* **The Waitlist Gate:** If the user selects "Request Kit," the system checks the gender equilibrium backend.
  + *If Quota Full:* A polite, formal modal appears: *"Due to strict scientific equilibrium protocols, the Pilot Pool for male testing kits is currently at capacity. You have been placed on the Priority Access List. Please proceed with Visual and Psychometric calibration."*.1

## 4. Module 2: Calibration (The Meta FP Engine)

Once onboarding is complete, the user enters the **Calibration Phase**. This module is designed to train the **Visual Preference (Meta FP)** algorithm, which accounts for 50% of the match score.1

### 4.1 The Theory: Transfer Learning & Dwell Time

The system uses "Transfer Learning".1 By analyzing the user's reaction to a standardized set of **Stock Images** (The Meta FP Dataset), it builds a preference vector that can be applied to the real testing pool.

* **Implicit Signals:** The system must track not just the explicit rating, but the **Dwell Time** (milliseconds spent looking) and **Decision Velocity** (speed of the swipe/click). Fast, high-rating decisions indicate "Visceral/Instinctive" attraction; slow, high-rating decisions indicate "Cognitive/Deliberative" attraction.1

### 4.2 UI Pattern: The "Portrait Gallery"

We reject the "Stack of Cards" (Tinder) model, which encourages disposability. Harmonia uses a **"Portrait Gallery"** or **"Easel"** metaphor.

* **The Frame:** The user is presented with a single portrait, framed by a subtle **Gold Leaf** border (border-champagne-400).
* **The Stimuli:** The first 14-50 images are from the **Meta FP Dataset** (StockX/Chicago Face Database).1 The user is unaware these are stock; they are presented as "Calibration Profiles."
  + *Context:* No names, no bios. Pure visual phenotype. This isolates the "Halo Effect" variable.1
* **The Rating Mechanism: The 1-5 Likert Scale.**
  + Binary "Like/Pass" is insufficient for granular data. We use a **5-point Gradient Slider**.
  + *Visual:* A horizontal track beneath the portrait.
    - **Track:** A thin line of **Mediterranean Blue**.
    - **Thumb:** A Brass/Gold knob with a subtle shadow.
  + *Feedback (Color Theory):*
    - **1-2 (Left):** The background behind the portrait cools (Desaturated Blue/Grey). The feedback text reads *"Indifferent."*
    - **3 (Center):** The background is neutral Parchment. Feedback: *"Potential."*
    - **4-5 (Right):** The background glows with a **"Golden Hour"** light (Warm Amber). Feedback: *"Magnetic."*
* **Interaction Physics:**
  + The slider uses **Spring Physics** (via Framer Motion). It has "weight." It doesn't snap instantly; it drags slightly, forcing the user to "feel" the rating.
  + *Dwell Capture:* The timer starts the moment the image renders. The vector of slider movement is recorded.

### 4.3 The "Trickle" Strategy

As per Felix's notes, the profiles are "trickled" out.1

* **Mix of Fake & Real:** The stream seamlessly mixes the Stock Images (Meta FP) with Real Profiles (Testing Pool).
* **The "Real" Flag:** For the backend/admin view (and potentially for the "Perceived Similarity" stage), there is a mechanism to signal if a profile is "Real" or "Fake" 1, but this is hidden from the user during Calibration to maintain the immersion.

## 5. Module 3: Assessment (The Sins & Perceived Similarity)

With the visual baseline established, the user moves to the **Psychometric Profiling** phase. This module measures the 35% "Personality" variable.1

### 5.1 Rebranding the "Seven Deadly Sins"

To fit the "Sophisticated Humanism" of Harmonia, the raw theological terms (Lust, Gluttony, etc.) are rebranded as **"Cardinal Drivers."** This reduces defensiveness while maintaining the archetypal power of the model.1

| **Theological Sin** | **Harmonia Driver** | **Visual Iconography (Sketch Style)** |
| --- | --- | --- |
| **Lust** | **Passion** | A Burning Heart or Flame |
| **Gluttony** | **Indulgence** | A Wine Chalice or Cornucopia |
| **Greed** | **Ambition** | A Crown or Mountain Peak |
| **Sloth** | **Serenity** | A Sleeping Lion or Still Water |
| **Wrath** | **Conviction** | A Sword or Lightning Bolt |
| **Envy** | **Yearning** | An Eye or Mirror |
| **Pride** | **Dignity** | A Peacock Feather or Pillar |

### 5.2 The "Inquiry Deck" Interface

This module uses a **Single-Card Stack** layout, distinct from the Portrait Gallery.

* **The Card:** A large, vertical card centered on the screen.
  + *Background:* A slightly lighter cream (bg-parchment-50) to pop against the darker background.
  + *Watermark:* A faint, sketch-style watermark of the Driver's icon (e.g., a Crown for Ambition) sits behind the text.
* **The Question Logic (Forced Choice):**
  + Questions are binary (A vs. B) to force a decision and prevent "neutral" hedging.1
  + *Example:* "For **Serenity** (Sloth): Do you find regeneration in **(A) Motion and Activity** or **(B) Stillness and Silence**?"
* **Liquid Progress Indicator:**
  + Instead of a digital bar, the right edge of the screen features a thin, vertical glass tube.
  + As the user answers, the tube fills with **Royal Blue Fluid** (Ink). This reinforces the metaphor of "writing one's profile."
* **Transition Animation:**
  + When an option is selected, the text doesn't just fade. It transforms into **Gold Dust** particles that flow upward into a "Profile Icon" in the header.
  + This animation visually confirms data capture, satisfying the "Labor Illusion."

### 5.3 The "Perceived Similarity" Experiment

In the backend, this module captures the user's "Actual Personality." However, during the matching phase (Module 5), this data will be manipulated to test **"Identity Malleability"**.1 The UI must be capable of displaying "highlighted traits" that may or may not be statistically significant, effectively "telling" the user they are similar to a match to see if they believe it.

## 6. Module 4: The Analysis Engine (The "Labor Illusion" Loading Screen)

This module is the psychological pivot point of the application. The user has invested effort (Setup, Calibration, Assessment). Now, the system must demonstrate the "Labor" of finding a match.1 A simple spinner is insufficient; the user must *see* the synthesis of the three data streams.

### 6.1 The "Theater of Computation"

The screen dims, creating a spotlight effect. The animation sequence lasts exactly **5 seconds** 1, choreographed to frame the "Scientific Humanism" narrative.

* **Stage 1: Genomic Sequencing (0s - 1.5s)**
  + *Visual:* A **Vitruvian Man** or anatomical sketch appears in the center. Overlaid is a **Double Helix** drawn in Gold Ink.
  + *Animation:* The helix rotates. Specific "bands" (HLA markers) light up in **Mediterranean Blue**.
  + *Text:* Vertical streams of "Matrix-style" text, but utilizing the specific HLA nomenclature 1: *"HLA-A*02:01... MATCH"\*, *"Parsing Chromosome 6..."*, *"MHC Synergy Detected."*
* **Stage 2: Visual Calibration (1.5s - 3s)**
  + *Visual:* The helix fades. A **Wireframe Face Mesh** appears. It morphs rapidly, cycling through the specific phenotypes the user rated highly in the Calibration phase (e.g., specific eye shapes, jawlines).1
  + *Text:* *"Triangulating Meta FP Vector..."*, *"Calibrating Symmetry Preference..."*.
* **Stage 3: Psychometric Triangulation (3s - 4.5s)**
  + *Visual:* A **Compass Rose** (Radar Chart) appears. It spins and shifts shape, expanding and contracting as if "seeking" a lock.
  + *Text:* *"Cross-referencing Driver Matrix..."*, *"Seeking Complementary Serenity/Ambition Dynamics..."*.
* **Stage 4: Synthesis (4.5s - 5s)**
  + *Visual:* All three layers—The Helix, The Face, The Compass—collapse into a single **Golden Point** of light in the center.
  + *Climax:* The point explodes outward in a shockwave of gold dust and light, revealing the **Results Page**.

## 7. Module 5: The Results (Synthesis & Profile)

The Results Page is the dossier. It must present the match not as a "Profile" but as a **"Compatibility Report."**

### 7.1 The Match Score Breakdown (The Donut)

* **Central Metric:** A large, elegant number (e.g., **"94%"**) set in **Cormorant Garamond**. It sits in the center of a concentric **Donut Chart**.
* **The Rings (Data Visualization):**
  + **Visual (50%):** A thick ring of **Mediterranean Blue**.
  + **Psychometric (35%):** A ring of **Deep Burgundy**.
  + **Genetic (10%):** A ring of **Gold Champagne** (representing the "Spark").
  + **Serendipity (5%):** A segment of **White/Void** (representing the unknown).
* **Interaction:** Tapping a segment isolates that score and displays a detailed breakdown below.

### 7.2 The Psychometric Compass (Radar Chart)

* **Visual:** A **Heptagonal Radar Chart** (7 Axes for the 7 Drivers).1
* **Styling:**
  + *Grid:* Faint gold lines (stroke-champagne-400), resembling a map grid.
  + *User Shape:* Filled with **Blue Ink** (Multiply blending mode).
  + *Match Shape:* Filled with **Red/Burgundy Ink** (Multiply blending mode).
  + *Overlap:* The intersection creates a deep **Purple/Indigo**. Large overlap visually signifies high compatibility.
* **Insight Tooltip:** Hovering over an axis (e.g., "Ambition") expands a text box: *"Your high Ambition complements their moderate Serenity, creating a dynamic of 'Drive and Support'."*

### 7.3 The "Chemical Spark" Indicator (The Placebo)

This section handles the 10% Biological variable.

* **Visual:** A horizontal **"Chromosome Map"** styled like a ruler or scale below the charts.
* **Logic:**
  + *True Positive / Placebo Groups:* If the user is in Group A (True Match) or Group B (Placebo) 1, specific bands on the ruler glow **Gold**. A badge appears: **"Chemical Spark Detected."**
  + *Copy:* *"MHC Dissimilarity indicates robust biological chemistry."*.1
  + *Negative Control:* The ruler remains dim. No badge.
* **Strategic Note:** The UI effectively "blinds" the user to the reality of the DNA match, serving the validation protocol by delivering the *suggestion* of compatibility perfectly.

### 7.4 The "Perceived Similarity" Narrative

Below the data, an AI-generated text summary appears.

* **Content:** This text is dynamically generated to emphasize shared traits (High Similarity Condition) or complementary differences (Low Similarity Condition).1
* **Tone:** The copy must be authoritative and insightful, reinforcing the "Scientific" validity of the match.

### 7.5 The Connection Protocol (Meeting)

* **The Call to Action:** Instead of "Message," the button reads **"Initiate Protocol"** or **"Open Channel."**
* **Chat Logic:** As per the meeting notes 1, the system may gate the full reveal or meeting capability until a certain threshold of interaction (messages exchanged) is met, ensuring data is collected on the *process* of connection.

## 8. Technical Architecture & Implementation Strategy

To execute this "Best Ever" design within the constraints of an AI coding agent, the technology stack is selected for performance, animation fidelity, and aesthetic control.

### 8.1 Core Stack

* **Framework:** **React (Next.js App Router)**. Ensures fast initial load and SEO (for the web version).
* **Styling:** **Tailwind CSS**. Configured with the specific parchment, mediterranean, and champagne color tokens.
* **State Management:** **Zustand**. A lightweight store to manage the complex, multi-stage state (Setup -> Calibration -> Quiz -> Results) without the boilerplate of Redux.
* **Animation:** **Framer Motion**. Essential for the "Labor Illusion" sequences (sequencing, morphing, layout transitions) and the spring-physics of the rating slider.1
* **Data Visualization:** **Recharts**. Chosen for its composability and ability to render SVG-based Radar/Donut charts that can be styled with custom distinct colors and strokes (e.g., the "Gold Grid").1
* **Icons:** **Lucide-React**. Styled with thin stroke widths to match the elegant typography.

### 8.2 The HLA Processing Pipeline (Backend Logic)

While the frontend handles the "Theater," the backend (mocked or real) follows a strict pipeline 1:

1. **Parser:** Detects format (23andMe/Ancestry), extracts Chromosome 6 data (Positions 29M-34M).
2. **Imputation (HIBAG):** Uses R-based HIBAG to infer HLA alleles.
3. **Standardization:** Converts to 2-field format (e.g., A\*02:01).
4. **Compatibility:** Calculates the **Allele Sharing Score** (0-6). 0 Shared = High Compatibility (The Spark).

## 9. Master Prompts for Code Generation

The following section aggregates the architectural, visual, and logical requirements into a set of "Master Prompts" designed to be fed directly into an AI coding agent (e.g., Claude 3.5 Sonnet or GPT-4o). These prompts enforce the "Harmonia" style and the specific logic of the validation study.

### 9.1 Prompt 1: Design System & Foundation

# Role: Lead Frontend Architect & Design Systems Lead

# Objective: Initialize the "Harmonia" Design System in Tailwind CSS and React.

Context:

We are building "Harmonia," a high-end algorithmic dating platform. The aesthetic is "Scientific Humanism"—a fusion of classical instruments (astrolabes, manuscripts) and modern data science. It must feel like a "destiny engine," not a game.

1. Color Palette (Tailwind Configuration):

Extend tailwind.config.js with these specific tokens:

* parchment:
  + 50: '#fbf9f5' (Base Background - Warm Paper)
  + 100: '#f5f0e6' (Card Surface - Cream)
  + 200: '#e6ddd0' (Borders/Dividers)
  + 900: '#2c241b' (Primary Text - Dark Ink)
* mediterranean:
  + 500: '#2a4e6c' (Primary Brand - Deep Blue)
  + 600: '#1f3b54' (Active States/Shadows)
* champagne:
  + 400: '#d4af37' (Accents/Gold - The Spark)
  + 500: '#c5a028' (Hover States)
* danger:
  + 500: '#8b0000' (Deep Burgundy - For "Sins" Match Data)

**2. Typography:**

* **Headers:** "Cormorant Garamond" (Google Font). Use for H1-H6, "Spark" badges, and major metrics.
* **Body:** "DM Sans" (Google Font). Use for inputs, data labels, and button text.

**3. Visual Effects (Glassmorphism & Texture):**

* Create a custom utility .bg-parchment-texture that applies a subtle SVG noise overlay to the parchment-50 background to simulate paper grain.
* Create .glass-panel: bg-parchment-100/90 backdrop-blur-md border border-champagne-400/30 shadow-lg shadow-mediterranean-500/10.
* Shadows must be colored (Blue-tinted), not grey.

**4. Component Primitives:**

* **Buttons:** Not rounded pills. Slight border-radius (rounded-md). Primary buttons use bg-mediterranean-500 with font-dm-sans.
* **Inputs:** "Underlined" style. No background. Border-bottom border-parchment-200. On focus, animate border to mediterranean-500.

Output:

Generate the tailwind.config.js and a layout.tsx wrapper that applies the font and texture globally.

### 9.2 Prompt 2: Core Logic & Modules (State Machine)

# Role: Senior React Developer

# Objective: Build the Core Logic and Modules for Harmonia.

**Stack:** React, Framer Motion, Zustand.

1. State Management (Zustand Store):

Create useHarmoniaStore with:

* currentPhase: Enum
* gender: 'MALE' | 'FEMALE'
* dnaKitStatus: 'NONE' | 'REQUESTED' | 'WAITLISTED'
* metaFPScores: Array of objects { imageId, score (1-5), dwellTimeMs }
* quizAnswers: Object { openness: 'A', ambition: 'B',... }
* hlaMatch: Boolean (True/False - The "Spark")

**2. Module 1: Setup (Onboarding):**

* **Inputs:** Name, Email.
* **Gender Toggle:** Segmented Control (Sliding Gold Background).
* **DNA Logic:**
  + Create a "Biometric Seal" component. Circular, Double Border (Blue/Gold).
  + Inside: Stylized DNA Icon.
  + On Drag/Drop: Animate circle filling with "Gold Ink" (SVG clip-path).
  + Text Feedback: Cycle through "Parsing Chromosome 6...", "Imputing HLA Alleles..." (3s delay).
  + **Waitlist Logic:** If user selects "Request Kit" and gender === 'MALE', show Modal: "Pilot Pool at Capacity. Added to Priority List."

**3. Module 2: Calibration (Meta FP):**

* **Layout:** "Portrait Gallery" (Single Card, Gold Frame).
* **Stimuli:** Iterate through 5 stock images (placeholders).
* **Input:** 5-Point Slider.
  + Track: Blue Line.
  + Thumb: Gold Knob.
  + Feedback: Left = "Indifferent" (Cool BG), Right = "Magnetic" (Warm Amber BG).
  + **Metric:** Capture time from render to rating.

**4. Module 3: Assessment (The Drivers):**

* **Content:** 7 Questions mapping to "Sins" (Passion, Ambition, Serenity, etc.).
* **UI:** Single Card Stack.
* **Progress:** Vertical "Glass Tube" on the right filling with Blue Ink.
* **Animation:** On answer, text dissolves into Gold Particles and flies to header.

**5. Module 4: Analysis (The Labor Illusion):**

* **Duration:** 5 Seconds.
* **Sequence:**
  1. **Genomic:** Rotating DNA Helix (Gold). Text: "Sequencing HLA..."
  2. **Visual:** Morphing Face Mesh. Text: "Triangulating Meta FP..."
  3. **Psychometric:** Radar Chart scanning. Text: "Cross-referencing Drivers..."
  4. **Synthesis:** Collapse to center point -> Explosion -> Results.

**6. Module 5: Results:**

* **Charts:**
  + Donut Chart (Recharts): 50% Visual (Blue), 35% Psych (Burgundy), 10% Genetic (Gold). Center: "94%".
  + Radar Chart (Recharts): 7 Axes. User (Blue), Match (Burgundy). Overlap = Purple.
* **Spark Indicator:**
  + If hlaMatch === true, show "Chromosome Map" (Ruler) with Gold Bands glowing. Badge: "Chemical Spark Detected."

Output:

Generate the React components for these modules, ensuring Framer Motion handles the page transitions (Fade/Slide).

## 10. Conclusion and Strategic Implication

The Harmonia architecture represents a comprehensive synthesis of **Scientific Rigor** and **Humanist Design**. By creating an interface that respects the user's desire for depth and narrative—leveraging the "Labor Illusion" of the Analysis Engine and the "Classical" aesthetic of the Design System—Harmonia addresses the core market failure of dating app fatigue.

The specific integration of the **Tri-Factor Model** (Visual, Psychometric, Genetic) within a rigorous **Time/Type Matching** framework ensures that the platform is not just a matchmaking tool, but a validatable scientific instrument. The **Warm Parchment** and **Gold Champagne** aesthetic serves a functional purpose: it slows the user down, encouraging the "deliberative" cognition required for meaningful choice, rather than the "instinctive" speed of the swipe economy. This is the future of Quantified Romance: precise, beautiful, and deeply human.

#### Works cited

1. Dating Algorithm Validation Methodology Design.pdf