

Product Requirements / Features for TrialGPT

1. Patient Data Processing and Management

- **Feature:** Ability to process **longitudinal patient data** including medical notes, lab results, imaging data, and treatment history.
- **Requirement:**
 - Support for both structured (e.g., lab values, medication lists) and unstructured data (e.g., doctor notes, imaging reports).
 - Integration with **Electronic Health Records (EHR)** systems for real-time patient data updates. Here Synthea was a good choice.

2. Clinical Trial Data Integration

- **Feature:** Import and manage clinical trial eligibility criteria from global databases like [ClinicalTrials.gov](https://clinicaltrials.gov).
- **Requirement:**
 - Automated parsing of trial eligibility criteria from multiple sources.
 - Regular synchronization with clinical trial databases to ensure up-to-date information.

3. Criterion-Level Patient Matching

- **Feature:** Fine-grained patient-to-trial matching based on specific inclusion and exclusion criteria.
- **Requirement:**
 - Ability to evaluate each criterion individually, providing a **natural language explanation** for why a patient does or does not meet the criterion.
 - Support for handling ambiguous or incomplete patient data by using inferential logic.

4. Explanation and Transparency

- **Feature:** Generate **explainable AI outputs** for clinicians to understand the rationale behind each match.
- **Requirement:**
 - Provide a human-readable **relevance explanation** for each trial's eligibility decision.
 - Highlight specific **sentences** or data points in the patient notes that correspond to eligibility criteria.

5. Trial Ranking and Exclusion

- **Feature:** Rank clinical trials based on patient eligibility and exclude irrelevant or ineligible trials.
- **Requirement:**
 - Use both **linear aggregation** and **LLM-based aggregation** to calculate trial relevance scores.
 - Provide configurable **exclusion rules** to automatically filter out non-relevant trials.

6. User Interface for Clinicians

- **Feature:** User-friendly interface for clinicians to review matched trials and patient eligibility explanations.
- **Requirement:**
 - Intuitive dashboard with **filters** and sorting options for reviewing patient-trial matches.
 - Real-time collaboration tools, allowing multiple clinicians to review and annotate matches.

7. Feedback Mechanism for Continuous Learning

- **Feature:** Ability to capture feedback from clinicians to improve TrialGPT's future performance.
- **Requirement:**
 - Allow clinicians to provide feedback on trial matches and explanations.
 - Implement a **learning loop** where feedback is used to fine-tune TrialGPT's model over time.

8. Time-Saving Automation

- **Feature:** Reduce manual effort in patient-trial matching.
- **Requirement:**
 - Automatically prioritize the most relevant trials to review, saving time compared to manual processes.
 - Target to **reduce clinician time** spent on trial matching by at least 40%.

9. Predictive Outcomes and Suitability Scores

- **Feature:** Predict patient outcomes based on trial history and patient characteristics.
- **Requirement:**
 - Use historical trial data to develop predictive models for **treatment outcomes**.
 - Generate a **suitability score** for each trial, which not only measures eligibility but also estimates likely patient outcomes.

10. Customizable Filters and Criteria

- **Feature:** Allow trial administrators and clinicians to create custom filters for trials.

- **Requirement:**
 - Provide **custom rule creation** to prioritize trials based on factors such as trial phase, location, or treatment type.
 - Support configurable exclusion/inclusion parameters for fine-tuned trial selection.

11. Reporting and Analytics

- **Feature:** Provide detailed analytics on trial matching performance and patient recruitment efficiency.
- **Requirement:**
 - Generate reports on matching accuracy, time saved, and clinician feedback.
 - Track patient-trial match histories to identify **recruitment trends** and **bottlenecks**.