# **Prior Art Search Documentation**

**BME 417 - Biomedical Engineering Capstone Design**

## **Project Information**

**Project Title:** AI Empathy Teaching Tool

**Team Number:** 19

**Team Members:** Elijah Don, Tanner Hochberg, Ian Marcon, Alexander Roussas, Ethan Vanderpool

**Date:** 10/26/2025

## **Search Strategy Documentation**

### **Search Methodology**

Document the approaches you used to identify relevant patents:

* [ ] Solution concept/function-based search
* [ ] Mechanism/implementation approach search
* [ ] Company/assignee-based search
* [ ] Citation following from relevant patents
* [ ] Patent number search (from literature references)
* [ ] Inventor name search
* [ ] Other: [Specify]

### **Search Databases Used**

We applied our search methodology primarily on Google Patents and the USPTO patent search

### **Key Search Terms**

List the primary keywords, phrases, and patent classifications used:

* **Primary Keywords:**
* **Secondary Keywords:**
* **Patent Classifications (if used):**
* **Boolean Search Combinations:**

## **Patent Analysis**

### **Patent 1**

**Patent Name:** [Full official patent title]

**Patent Number:** [Include full patent number with country code if applicable]

**Patent Holder/Assignee:** [Company or individual who owns the patent]

**Issue Year:** [Year patent was granted]

**Issue Country:** [Country of patent grant]

**Status:** [Active/Expired - include expiration date if known]

**Patent Image:** [Insert image of the invention from patent document - this could be the main figure or most relevant diagram]

**Relevance Description:** [Minimum 3 sentences or bullet points explaining how this patent relates to your project. Address technical similarities, potential design constraints, or insights gained.]

**Key Claims Relevant to Project:** [List 2-3 most relevant patent claims that could impact your design]

**Design Implications:** [How does this patent influence your design decisions? What does it tell you about existing solutions?]

### **Patent 2**

**Patent Name:**

**Patent Number:**

**Patent Holder/Assignee:**

**Issue Year:**

**Issue Country:**

**Status:**

**Patent Image:** [Insert image]

**Relevance Description:**

**Key Claims Relevant to Project:**

**Design Implications:**

### **Patent 3**

**Patent Name:**

**Patent Number:**

**Patent Holder/Assignee:**

**Issue Year:**

**Issue Country:**

**Status:**

**Patent Image:** [Insert image]

**Relevance Description:**

**Key Claims Relevant to Project:**

**Design Implications:**

### **Patent 4**

**Patent Name:**

**Patent Number:**

**Patent Holder/Assignee:**

**Issue Year:**

**Issue Country:**

**Status:**

**Patent Image:** [Insert image]

**Relevance Description:**

**Key Claims Relevant to Project:**

**Design Implications:**

### **Patent 5**

**Patent Name:**

**Patent Number:**

**Patent Holder/Assignee:**

**Issue Year:**

**Issue Country:**

**Status:**

**Patent Image:** [Insert image]

**Relevance Description:**

**Key Claims Relevant to Project:**

**Design Implications:**

## **Patent Landscape Analysis**

### **Technology Categories**

Organize the patents you found into relevant technology categories:

**Category 1:** [e.g., Sensing Technology]

* Patents: [List patent numbers]
* Key insights:

**Category 2:** [e.g., Signal Processing]

* Patents: [List patent numbers]
* Key insights:

**Category 3:** [e.g., User Interface]

* Patents: [List patent numbers]
* Key insights:

### **Competitive Landscape**

**Major Patent Holders in This Space:**

* Company/Organization 1: [Number of relevant patents, key focus areas]
* Company/Organization 2: [Number of relevant patents, key focus areas]
* Company/Organization 3: [Number of relevant patents, key focus areas]

### **Patent Timeline Analysis**

Create a brief timeline showing when key patents in your area were filed:

* **[Year]:** [Brief description of patent developments]
* **[Year]:** [Brief description of patent developments]
* **[Year]:** [Brief description of patent developments]

## **Design Freedom Analysis**

### **Potential Patent Constraints**

List patents that might limit your design freedom:

1. **Patent:** [Number and brief title] **Constraint:** [How this might limit your design choices] **Workaround Strategy:** [How you might design around this patent]
2. **Patent:** [Number and brief title] **Constraint:** [How this might limit your design choices] **Workaround Strategy:** [How you might design around this patent]

### **Design Opportunities**

Identify gaps in the patent landscape that represent opportunities:

1. **Opportunity:** [Description of unpatented approach or improvement] **Supporting Evidence:** [Why you believe this is unpatented]
2. **Opportunity:** [Description of unpatented approach or improvement] **Supporting Evidence:** [Why you believe this is unpatented]

## **Summary and Conclusions**

### **Key Findings**

## **Summarize the most important insights from your patent search:**

### **Impact on Project Direction**

## **How will these findings influence your design approach?**

### **Recommendations for Team**

## **Based on your patent analysis, what recommendations do you have for the team moving forward?**

## **Search Documentation**

### **Search Log**

Document your search process for reproducibility:

| **Date** | **Database** | **Search Terms Used** | **Results Found** | **Notes** |
| --- | --- | --- | --- | --- |
| [Date] | [Database] | [Terms] | [Number] | [Key observations] |
| [Date] | [Database] | [Terms] | [Number] | [Key observations] |
| [Date] | [Database] | [Terms] | [Number] | [Key observations] |

### **References and Citations**

## **List any additional sources that helped inform your patent search:**

**Prepared by:** [Name] **Reviewed by:** [Team member names] **Date Completed:** [Date]