Feasibility Study

GestureAI

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1. Introduction

1.1. Project Overview

GestureAI is a mobile application that uses a specially trained Artificial Intelligence (AI) model to translate American Sign Language (ASL) to text and speech. In the current landscape, there have not been many advancements in the way technology helps people with hearing impairment to more easily communicate with the general public. Even in major establishments or government facilities, people with hearing impairments, in some cases, have to schedule appointments weeks in advance in order to be able to be seen properly. GestureAI is a step in that direction. To bridge this gap and make communication more easily accessible.

1.2. Project Objective

The objective of GestureAI is to harness the power of AI to help make understanding ASL and communication with a person who only uses ASL much easier. GestureAI will aim to bring live translation of ASL to the palm of the hand. It will also offer an animated avatar that would translate text into ASL so that users can learn ASL. GestureAI will also be compatible with select visual hardware that would enable for a more seamless conversation.

1.3. Project Scope

1.3.1. High Priority:

1.3.1.1. Live video translation of ASL to text and audio
1.3.1.2. Train AI model to recognize ASL gestures
1.3.1.3. Supporting both mobile (iOS/Android) and desktop latest platforms

1.3.2. Regular Priority:

1.3.2.1. Prototyping AR glasses to show subtitles from ASL translation
1.3.2.2. Animated avatar that performs ASL translations of text or audio

2. Description of Products and Services

2.1. Project Products and Services

GestureAI aims to bridge the gap between the general public and those that rely on sign language to communicate. Until now, there has not been much advancement in the merging of technology to make

communication easier for people who rely on ASL. GestureAI plans to release a phone application on both IOS and Android that would allow for a more seamless interaction. GestureAI will also offer products such as Augmented Reality (AR) glasses to allow a person to read generated subtitles when communicating with a person using ASL.

2.2. Deliverables

The deliverables for this project are:

- The GestureAI application that is designed for iOS, Android and devices running Windows 11 or above.
- Documentation
- Prototyped Augmented Reality glasses

3. Technology Considerations

3.1. Technical Feasibility

GestureAI will be tailored to the newest releases of mobile operating systems to allow for high compatibility with a wide user base. The company will also need to be able to manage user accounts, continuous AI training with new user submitted data, data storage and maintenance. The company must also ensure that the latency of translation services are low enough to allow for real time translation.

3.1.1. Current Hardware and Software

3.1.1.1. Hardware:

The current hardware being used to develop the application are:

- System: Windows 10 or higher and macOS computers
- GPU: NVIDIA RTX 6000 ADA to train the AI model
- DigitalOcean server to host the application
- Hard-Drive: 4TB to hold the training data for the AI

3.1.1.2. Software:

- Frontend: React Native with JavaScript for cross-platform development
- Backend: Python for rapid development and huge swath of helpful libraries

- Database: PostgreSQL to handle complex queries
- TensorFlow for AI training
- UI/UX Design: Figma for it’s dynamic design styles and collaboration that also generate CSS code for the mobile app
- Version Control: Git

3.1.2. Environment Development

In the development of GestureAI, the team is using Visual Studio Code software to code the frontend, backend, and database schemas in conjunction with the Git extension to push all collaboration changes to github for easy to manage version control. We initially planned on using SQLite for database management, but decided to switch to PostgreSQL. We’re using PostgreSQL because it can handle a lot more complex queries and a larger query volume than SQLite. Visual Studio code PostgreSQL extension is used in order to properly model the schemas and manage tables. We are using React Native to code the frontend so that we are able to launch the application on both iOS and Android platforms. We are also using TensorFlow software in order to train the AI model using the 4 TB hard drive containing ASL training data. We plan on using the powerful NVIDIA RTX 6000 to train the AI model in a short amount of time.

4. Product/Service Marketplace

4.1. Project Marketplace

The live translation marketplace for American Sign Language is scarce. Though there are many applications that translate text to ASL for educational purposes, there are not many that translate live video to text. There are three companies that relate to what GestureAI wants to accomplish: SignAll, HandTalk, and SlaitAI. A large majority of GetsureAI’s target customers are going to be regular people who find a need to communicate with people with hearing impairment, referrals from existing customers, and corporate entities. By providing a more convenient means of sign language communication it is expected that we will retain these customers while conducting an online marketing campaign for new customers as well.

GestureAI will distribute its software through the various app stores that will be free to download and use. The app will have tiered memberships and features that allows for the company to bring in revenue to help maintain staffing and pay for operation and maintenance costs.

4.1.1. User Feasibility

The goal of GestureAI is to bring ASL translation to as many people as possible. In an effort to reach as many people as possible, GestureAI will be available to anyone on the latest iOS and Android devices. The team will design the application so that any user will intuitively be able to navigate and use the features as intended. With the lack of live ASL translation mobile apps, many people and organizations will flock to GestureAI for their ASL needs.

4.1.1.1. Who are the users?

The target demographic of GestureAI is the general population. GestureAI is meant to be in as many hands as possible to make communication with hearing impaired people more accessible. This app is for everyone.

4.1.1.2. Why choose GestureAI?

Unlike the competitors, GestureAI will not only be an app where you can learn ASL. We will distinguish ourselves with our live translation feature and our AR spectacles. The competitors offer either text-ASL translation or live desktop translation. They do not offer both at once, nor does any competitor on the market offer live translation on mobile phones.

4.1.1.3. Projected Downloads?

The goal of GestureAI is to have at least 2000 - 5000 downloads in the app store within the first week of launch with the goal being 10,000 downloads within the first month. As the app grows in popularity, we expect to reach within the top 100 apps within the first 6 months.

4.2. Financial Feasibility

The development of GestureAI is financially feasible. All software that is used has free licenses for personal and commercial use. All training data are licensed to be freely used.

4.3. Operational Feasibility

4.3.1. Resources Feasibility

To host our server, for optimal performance, is only a small fee of around $30/month. When divided among three of us, comes out to around $10/person. When prototyping, we don’t plan on spending more than

$50 to get the prototype up and running. For this project, we do not need to launch the app in the app store, so collectively $80 is the total budget for launching GestureAI.

4.3.2. Time Feasibility

Time is a very valuable resource that we at 7Petabytes are managing very tightly. With three software engineers in our group, we are sure there are enough people to manage successfully delivering this application within the allotted time. To help with time, we are using Python programming language that enables us to quickly write programs without having to worry about memory management since Python has a garbage collection feature. We are also using a few Python libraries, so that the team does not have to code from the ground up.

5. Marketing Strategy

In order to be successful, GestureAI must differentiate itself from competitors in order to appeal to customers in the online marketplace. To do this, GestureAI will utilize its real time translations on mobile devices and AR glasses as the differentiator. Current competitors do not currently provide mobile real time translations. Customers will have the ability to easily communicate with persons with hearing impairment and with style.

GestureAI will implement a customer mailing list in order to send product promotions, sales advertisements, and other special offerings to customers who register. Additionally, GestureAI will offer referral incentives to customers who refer our products to friends and family in order to provide additional incentives. GestureAI will also maintain a customer database in order to determine its target customer groups and geographical regions. Another important consideration of GestureAI's online marketing strategy is cost. Electronic marketing communication costs are very small in comparison to direct mail marketing. However, we expect the additional revenue from online sales to greatly outweigh these additional electronic marketing costs.

6. Organization and Staffing

The GestureAI company will consist mainly of software engineers responsible for maintaining the application with bug fixes and updating features, validation and testing, AI training and more. The company will also onboard experts in the field of ASL to ensure the AI model is properly translating ASL correctly.

7. Ethical/Legal

This product will not violate any ethics because this app will not collect user data not explicitly agreed to or distribute any data. Legally, all software and development tools are free to use for both personal and commercial use. This app will follow all state, local and federal laws.

8. Schedule

The GestureAI application is expected to take one month from project approval to launch. Many of the foundations for this platform, such as high- speed internet and web server capability, are already available. The following is a high level schedule of some significant milestones for this initiative:

February 18, 2025: Initiate Project
March 7, 2025: Initiate AI training
March 20, 2025: Present working documentation and demo
March 27, 2025: Complete back-end and front-end integration
April 2, 2025: Initiate prototyping of the glasses
April 18, 2025: Have Project mostly completed,
with only fine tuning left
April 26, 2025: Present working application at
conference

9. Financial Projections

The financial projections for the launch of GestureAI are highlighted in the table below. These figures account for projected corporate sales, staffing requirements, and web server and hosting costs.

The assumptions for these projections are as follows:

- Basic Tier (for small teams or departments):
    - Price: $30–$50 per user per month
    - Features: Standard ASL-to-speech translation, real-time transcription, basic support.
- Professional Tier (for larger teams or organizations with specific needs):
    - Price: $75–$150 per user per month
    - Features: Advanced features like multi-language support (for other sign languages), integration with other business tools, priority customer

support, analytics, etc.

- Enterprise Tier (for large corporations or organizations with customized needs):
  - Price: $200–$500+ per user per month
  - Features: Full customization (e.g., integration with internal platforms), dedicated account management, on-premise deployment options, extensive reporting, and analytics.

Measure	Year 1	Year 2	Year 3	Year 4	Year 5	5 year total
Corporate Sales	$150,000	$200,000	$280,000	$345,000	$600,000	$725,000
Staffing Costs	$90,000	$110,000	$150,000	$185,000	$200,000	$280,000
Additional Web Server and IT Hosting/Maintenance	$2,000	$2,000	$2,500	$3,000	$4,000	$4,500
Training for Sales and Marketing Staff	$5,000	$0	$0	$0	$0	$9,000
Total Additional Costs for Application	$97,000	$112,000	$157,500	$188,000	$204,000	$293,500
Cash Inflow	$53,000.00	$88,000.00	$122,500.00	$157,000.00	$396,000.00	$431,500.00

10. Findings and Recommendations

Based on the information presented in this feasibility study, it is recommended that GestureAI is a viable product that can be profitable. The findings of this feasibility study show that this initiative has a high probability of success. Key findings are as follows:

Technology:

- Will utilize existing technology which lowers project risk
- App Stores as vendors ensures constant reach and visibility to the user base
- Once in place this technology is simple to operate and maintain for a relatively low cost

Marketing:

- This initiative will allow GestureAI to reach large number of target groups electronically at a low cost
- GestureAI can expand customer base beyond initial American

Sign Language when campaigning overseas
- The need for easier communication with people who use sign language is still untapped
- GestureAI is able to differentiate itself from its competitors and will utilize incentive programs to target new consumers

Organizational:
- Minimal increases to staffing are required with no changes to organizational structure

Financial:
- Profit occurs early in the very first year of operation
- Five year projections show That as GestureAI is utilized more, the business grows exponentially
- GestureAI will be in position to capture greater market share by maintaining both a mobile application and AR glasses