



BUILD SOLUTIONS TO
UNLOCK THE POTENTIAL OF
HETEROGENEOUS COMPUTING

Team Name : Brainwave

Problem Statement : Open innovation in Education

A FRESH APPROACH TO THE CONCEPT

A NEUROLOGICAL CONDITION CALLED DYSLEXIA IMPAIRS A PERSON'S CAPACITY FOR READING, WRITING, AND SPELLING. IT AFFECTS HOW THE BRAIN INTERPRETS LANGUAGE, MAKING IT CHALLENGING FOR THOSE WITH DYSLEXIA TO UNDERSTAND WRITTEN CONTENT. BETWEEN 5% AND 20% OF INDIANS SUFFER WITH DYSLEXIA, WITH URBAN REGIONS HAVING A HIGHER PREVALENCE OF THE CONDITION. THIS INDICATES THAT MILLIONS OF INDIAN SCHOOL CHILDREN EXPERIENCE READING AND COMPREHENSION PROBLEMS AS A RESULT OF THIS DISORDER. THE CREATION OF SOLUTIONS LIKE OUR PRODUCT DYSLEXIFY, A MACHINE LEARNING INITIATIVE INTENDED TO HELP PEOPLE WITH DYSLEXIA IMPROVE THEIR READING AND COMPREHENSION SKILLS, HAS BEEN MADE POSSIBLE BY TECHNOLOGICAL DEVELOPMENTS USING INTEL'S **ONEAPI**.

FEATURES WE OFFER SUCH AS

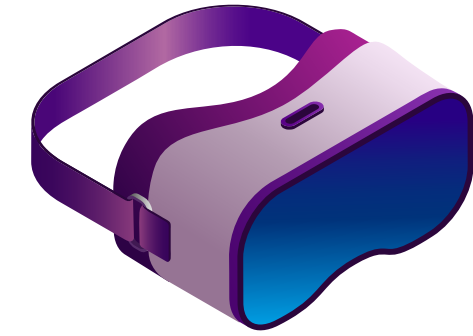
- 3D MODEL WITH AR INTERFACE **USING ONEAPI RENDERING TOOLKIT**
- IMAGE TO SPEECH RECOGNITION, TEXT TO SPEECH RECOGNITION, **USING SYCL**
- ML DRIVEN SUGGESTION OF BOOKS ,**USING DAAL4PY**
- AI POWERED DOCUMENT ASSISTANT,**USING GPU STRENGTH**

THROUGH THE USE OF 3D MODELS ALONG WITH AUGMENTED REALITY, EDUCATIONAL INSTITUTIONS CAN PROVIDE STUDENTS WITH AN INTERACTIVE LEARNING EXPERIENCE.. DYSLEXIFY HAS THE POTENTIAL TO SIGNIFICANTLY IMPROVE THE LIVES OF STUDENTS IN INDIA AND AROUND THE WORLD AND WILL HAVE A MAJOR IMPACT IN EDUCATION SECTOR .

SOME INTERESTING FEATURES

- **Javascript extention:** Which have the features such as dyslexic font, reading ruler, spacing adjust, line height adjust.
- **Reading Tools:** Provides with stories and rhymes, podacst and much more.
- **Lexi Virtual Assistant :** Interactive virtual assistant for our webpage

3D MODEL WITH AR INTERFACE



Bringing 3D models into the learning process and utilizing an augmented reality interface, students can visualize complex concepts, objects, in a more interactive and engaging manner. This technology enables students to manipulate and explore virtual objects, enhancing their understanding and retention of the subject matter.

How we did!

- The **oneAPI Rendering Toolkit** is used to create 3D models, which are then hosted on a WebAR platform for easy accessibility.
- The models are converted into the glTF format and uploaded to the chosen platform.
- Users can view and interact with the models through web browsers on various devices, without the need for specialized applications or high-end hardware.

This combination of powerful rendering tools powered by intel oneAPI and WebAR technology provides a seamless experience for individuals to explore and engage with captivating in augmented reality.

3D MODEL WITH AR INTERFACE

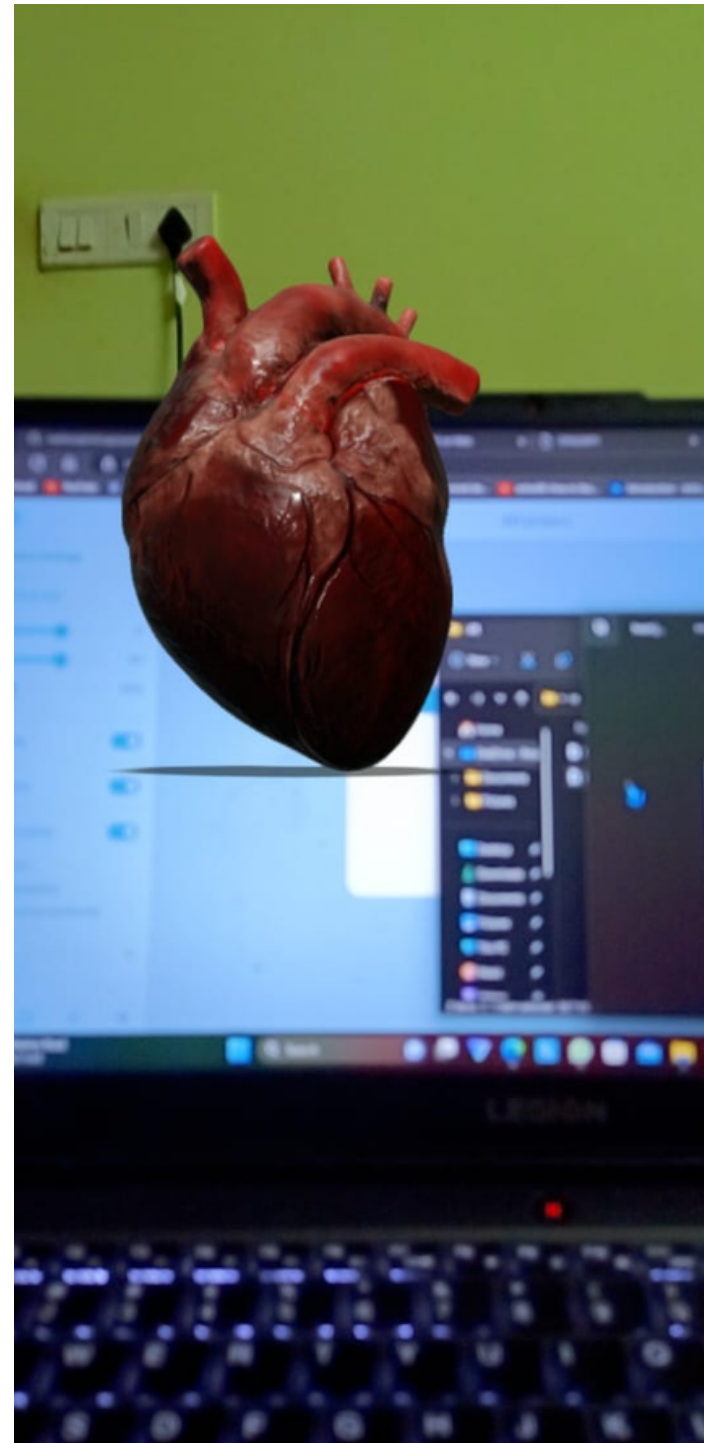
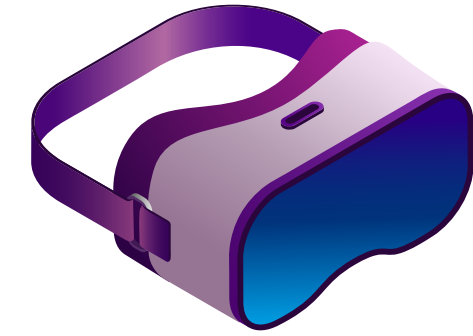
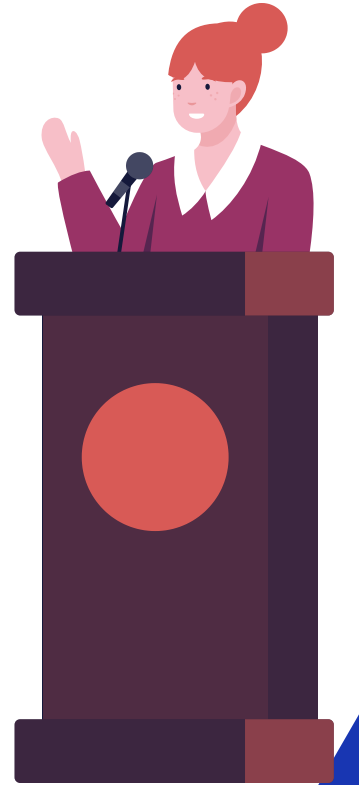


IMAGE TO TEXT TO SPEECH RECOGNITION

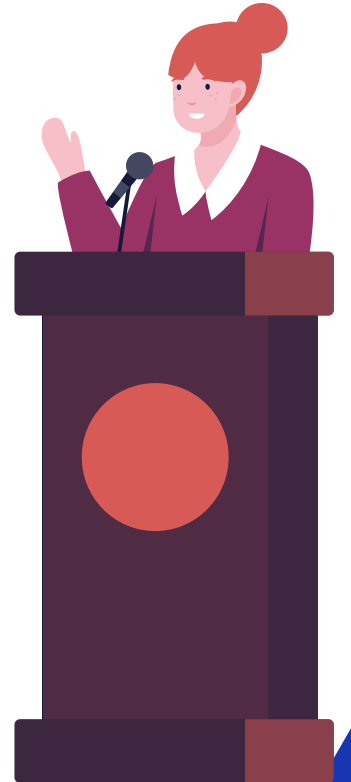
This feature enables students to capture images of text, such as medical prescription or text on whiteboards, and convert them into speech. It can assist students with visual impairments or those who prefer auditory learning, making educational content more accessible.



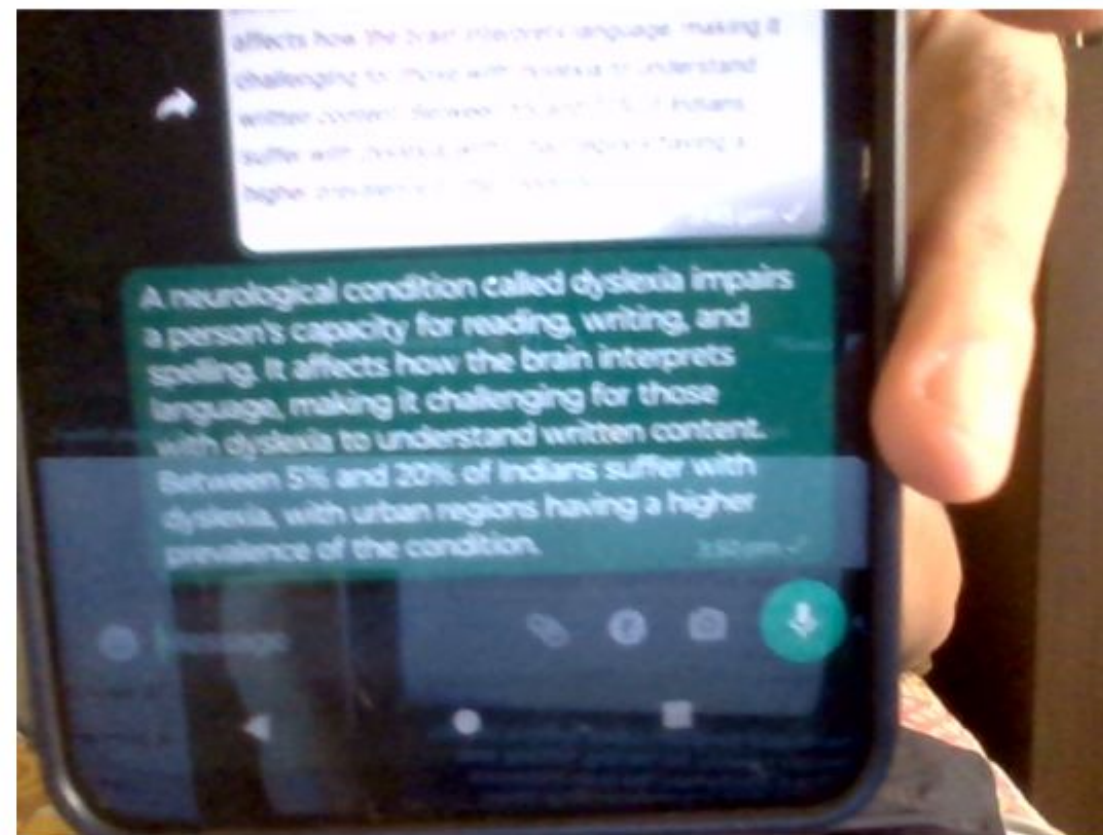
How we did!

1. Create SYCL kernels using the DPC++ programming model provided by the Intel oneAPI Toolkit.
2. Compile the SYCL DPC++ code using the DPC++ compiler provided by the Intel oneAPI Toolkit.
3. Use ctypes to create a Python wrapper for the compiled C++ code.
4. Import the Python wrapper into your Flask application.
5. Use the wrapper to call the SYCL DPC++ functions for image processing and speech conversion.

IMAGE TO TEXT TO SPEECH RECOGNITION



Dyslexify Image to Speech Converter



Capture Image

Recognized Text

A neurological condition called dyslexia impairs a person's capacity for reading, writing, and spelling. tt affects how the brain interprets language, making it challenging for those with dyslexia to understand written content. Between 5% and 20% of Indians suffer with dyslexia, with urban regions having a higher prevalence of the condition.

sage ® eo og

Speak

ML DRIVEN SUGGESTION OF BOOKS



With This feature , you can bid farewell to the overwhelming task of choosing your next read.

- The system analyzes your reading history, genre preferences, favorite authors, you will be able to choose what to read next by selecting the book which you already selected. It shows similar kind of suggestions.

How we did!

- The [daal4py](#) is used here. The main purpose of using daal4py in the project is to leverage the optimized implementations of algorithms provided by oneDAL.
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- The oneAPI Data Analytics Library (oneDAL) and its Python wrapper, daal4py, are used for computing cosine similarity between vectors.

ML DRIVEN SUGGESTION OF BOOKS



DYSLEXIFY

HomeMapLibrary

LIBRARY

Discover Top Books

Hover For Ratings, Click For Custom Reccomendations

DYSLEXIFY

HomeMapLibrary

Average Rating:
4.06

Plan B

Authors: Anne Lamott

Genre: Biography & Autobiography

A spiritual guide by the author of the best-selling Traveling Mercies shares humorous and inspirational advice on how to manage with grace in today's world of terrorism, while caring for aging parents and children simultaneously, and in the face of environmental threats. Reprint.

Back To Library

AI POWERED DOCUMENT ASSISTANT



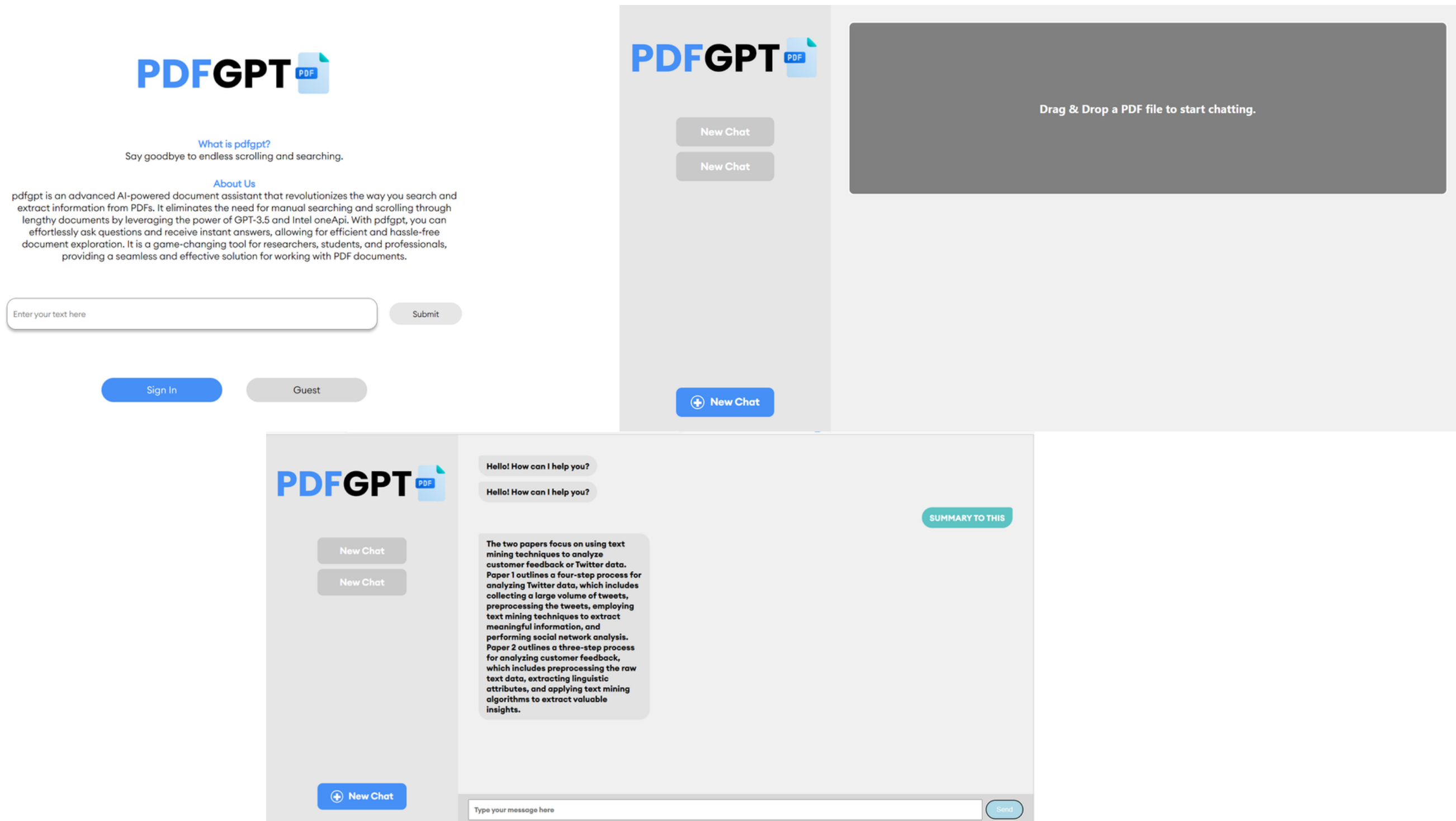
This is feature advanced AI-powered document assistant that revolutionizes the way you search and extract information from PDFs. It eliminates the need for manual searching and scrolling through lengthy documents by leveraging the power of **GPT-3.5** and **Intel oneApi**. With PDFGPT, you can effortlessly ask questions and receive instant answers, allowing for efficient and hassle-free document exploration.

How we did!

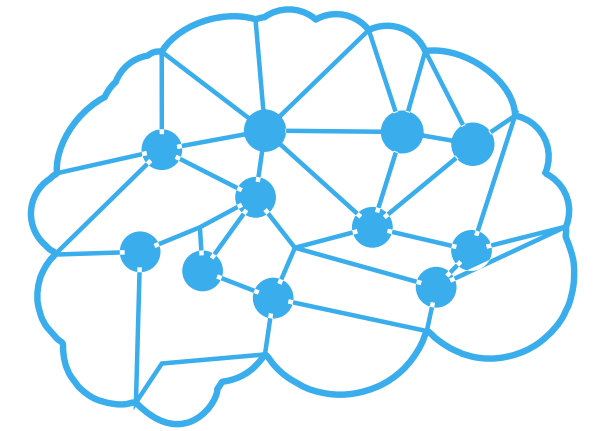
- Imports the SYCL context from the daal4py.oneapi module
- .This module provides SYCL functionality for GPU acceleration.
- This flexibility allows you to take advantage of the specific strengths of GPUs while maintaining portability across different hardware architectures.

It is a game-changing tool for researchers, students, and professionals, providing a seamless and effective solution for working with PDF documents.

AI POWERED DOCUMENT ASSISTANT



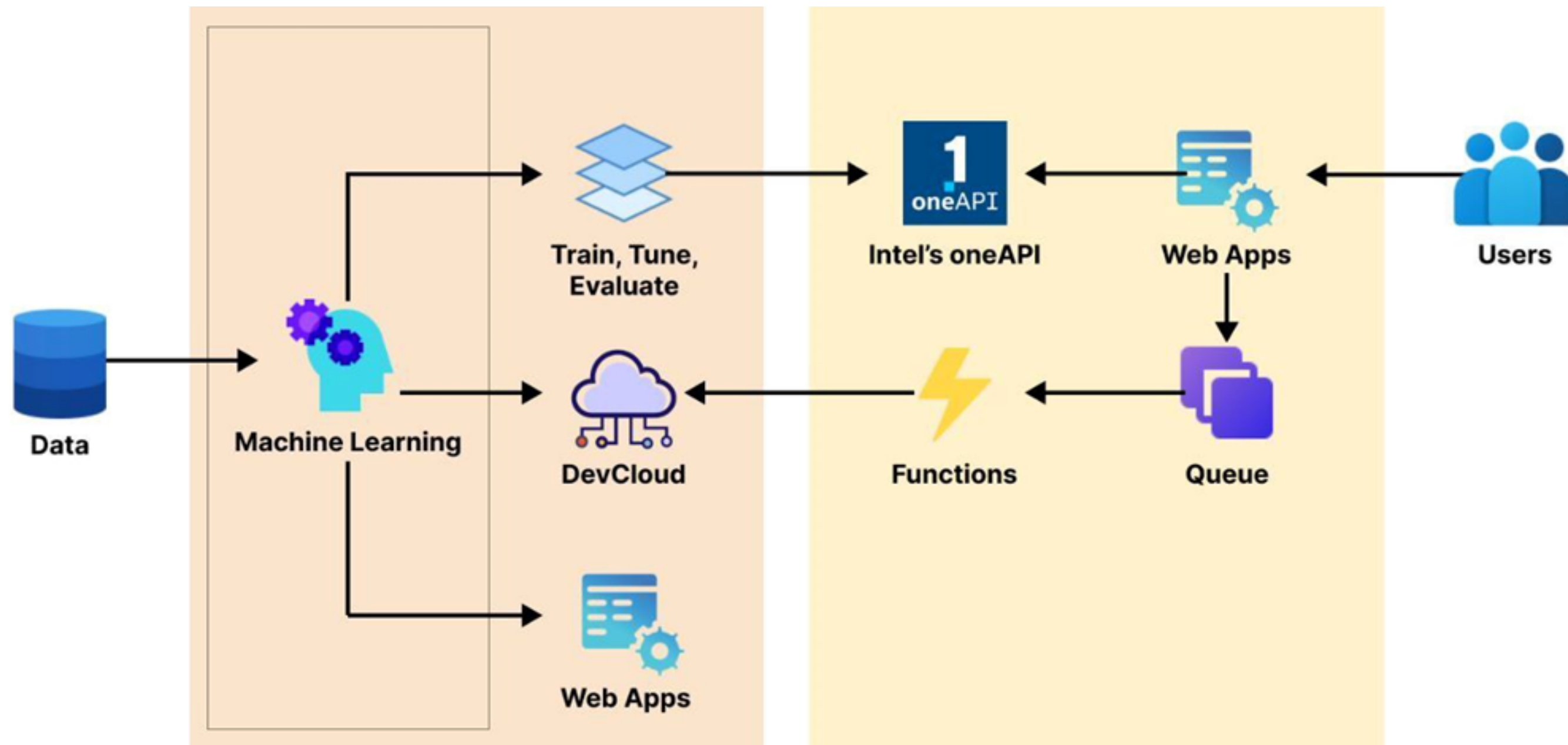
LIST OF ONEAPI TOOLS/LIBRARIES USED



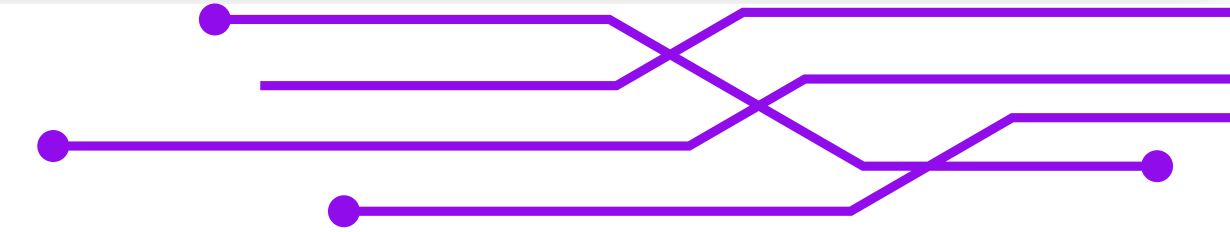
- **INTEL DATA ANALYTICS ACCELERATION LIBRARY (DAAL)**
- **INTEL 3D RENDERING TOOLKIT**
 - Intel OSPray
 - Intel OSPray studio
- **ONEAPI DPC++/SYCL**



ARCHITECTURAL DIAGRAM



TECHNOLOGIES USED



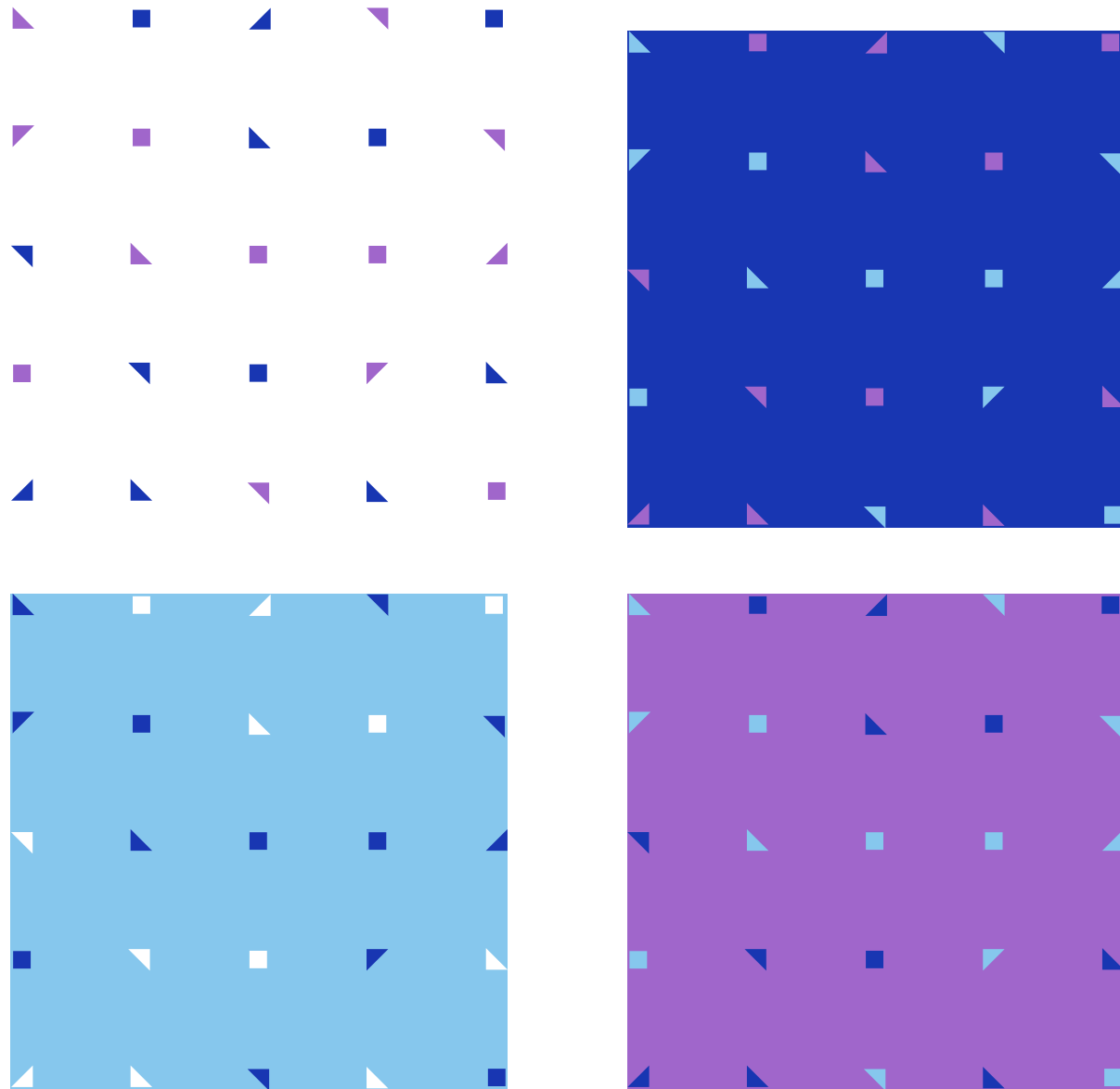
- **Machine Learning and AI:** Dyslexify uses machine learning and AI technologies such as to develop its features, such as image to speech recognition, text to speech recognition, personalized reading experience.
- **Intel oneApi Libraries:** Intel Data Analytics Acceleration Library (DAAL), oneAPI DPC++/SYCL
- **Cloud Service :** Intel devcloud, Render, WebAR, Pythonanywhere.
- **Framework:** Flask, React
- **Programming Languages:** Python, Javascript
- **APIs and Integrations:** OpenAI, GPT 3.5
- **3D Modeling :** Unity ,Blender, Intel OSPray/OSPray Studio



ESTIMATED COST OF/AFTER IMPLEMENTING THE SOLUTION

Dyslexify's low-scale implementation may cost between 20,000 to 1 lakh INR for development and a few thousand to a few tens of thousands of Indian Rupees per month for operation. For a large-scale implementation, the development cost can range from Rs. 3 lakhs to 10 lakhs, and the operating cost can be several lakhs of Indian Rupees per month, depending on various factors.





THANK YOU