

Open Innovation In Education

CHALLENGE

The education sector is facing numerous challenges in the wake of the COVID-19 pandemic. One of the major challenges is the need for innovative solutions to address the disparities in student learning outcomes and to ensure equitable access to quality education. To tackle this challenge, we are calling for an open innovation challenge that leverages the [Intel® AI Analytics Toolkits, its libraries and the SYCL/DCP++ Libraries](#) to develop innovative solutions that can improve student learning outcomes and promote equitable access to quality education.

Following are a few examples of potential solutions -

Example 1: Improving student learning outcomes: Develop a solution that utilises the OneAPI AI analytics toolkit to analyse and evaluate student learning outcomes. The solution should be able to identify areas where students are struggling and provide personalised learning interventions that can help improve their performance.

Example 2: Create an interactive educational platform that leverages the power of oneAPI to provide students with a personalised learning experience through interactive simulations and machine learning algorithms.

It is an open-ended challenge, you can either take inspiration from the above examples or base your solutions on other themes.

Participants are encouraged to be **innovative and think outside the box**. Solutions may involve the use of machine learning algorithms, natural language processing, computer vision, or any other relevant technology. The solutions developed should be scalable, sustainable, and have the potential to impact a significant number of students.

END GOAL

The ultimate goal of this open innovation challenge is to create innovative solutions that leverage the [Intel® AI Analytics Toolkits its libraries and the SYCL/DCP++ Libraries](#) to improve student learning outcomes and promote equitable access to quality education.

IMPORTANT NOTE

To achieve optimal performance and better models, it is required to use the [Intel® AI Analytics Toolkits its libraries and the SYCL/DCP++ Libraries](#) in the development of the interactive

educational platform. Therefore, participants are advised to leverage the libraries and optimizations provided by oneAPI to enhance the efficiency of the application.

You can explore the [Intel® AI Analytics Toolkits its libraries and the SYCL/DPC++ Libraries](#) to find the related libraries and optimizations for improving performance which will make your solution stand out. Some of the useful links to explore more about oneAPI are mentioned below:

1. [oneAPI Deep Neural Network Library](#)
2. [Intel® oneAPI Math Kernel Library \(oneMKL\)](#)
3. [Intel® oneAPI Threading Building Blocks](#)
4. [Intel® oneAPI Data Analytics Library](#)
5. [Intel® oneAPI DPC++ Library](#)
6. [Intel® Optimization for TensorFlow*](#)
7. [Intel® Optimization for PyTorch*](#)
8. [Intel® Distribution for Python*](#)
9. [Intel® Extension for Scikit-learn](#)
10. [Intel® Neural Compressor](#)
11. [Intel® oneAPI AI Reference Kit](#)

DELIVERABLES (Idea Submission Phase)

1. Presentation.pdf: Participants will have to submit a PPT presentation of their proposed idea which should clearly explain their idea, emphasising on the usage of [Intel® AI Analytics Toolkits its libraries, and SYCL/DPC++ Libraries](#).
2. The submitted PPT must include a **Process Flow Diagram** and an **Architectural Diagram**
3. Exploring Intel® AI Analytics Toolkits its Libraries, SYCL/DPC++ Libraries and their usage in the product is an essential aspect.
4. Products/Projects without oneAPI as the core component will not qualify for the hackathon

DELIVERABLES (Prototype Development Phase)

1. Participants are required to fork [this](#) repository and update the README file, filling in the required details. Then upload their code in the forked repository and create a pull request to submit the code.

2. Presentation.pdf: Participants will have to submit a PPT presentation of their prototype, showcasing their prototype workings along with a **Process Flow Diagram** and an **Architectural Diagram**. It should clearly mention the usage of [Intel® AI Analytics Toolkits its libraries, SYCL/DPC++ Libraries](#)
3. Participants are required to submit a comprehensive write-up that details their chosen problem statement, approach to the problem, and the code used to build their solution. This write-up should be in the form of a technical article posted on [medium.com](#). It will be evaluated by the judges for the functionality and creativity of the submitted solution. Therefore, it is crucial to submit a complete and clear write-up to increase your chances of winning the competition.
4. Participants are also required to submit a prototype demo video.
5. Implementation of Intel® AI Analytics Toolkits and its libraries, SYCL/DPC++ Libraries is a must for the POC completion.
6. Exploring the Intel® AI Analytics Toolkits and its libraries, SYCL/DPC++ Libraries and their usage in the product is an essential aspect.
7. Products/Projects without oneAPI as the core component will not qualify for the hackathon.
8. The prototype submission must lay down equal emphasis on the deployment/inference benchmarking for both, with and without Intel® oneAPI.

CODE SUBMISSION GUIDELINES

1. The **prototype submission** will be made by creating a pull request on [this](#) repository.
2. Participants are required to fork [this](#) repository, Push their prototype code and update its README file with all the required information to count as a valid submission. **The required information is mentioned below.**
 - a. Team Name,
 - b. Problem Statement,
 - c. Team Leader Email,
 - d. A Brief of the Prototype,
 - e. Tech Stack the prototype is Built Upon (Clearly mentioning [Intel® AI Analytics Toolkits its libraries and the SYCL/DPC++ Libraries](#) used.)
 - f. Step-by-Step Code Execution Instructions
 - g. What I Learned

*Here is a link to a [Sample Submission](#)

CRITERIA FOR SUCCESS

1. Innovative Solution: The solution developed should demonstrate innovation and creativity in leveraging the [Intel® AI Analytics Toolkits its libraries and the SYCL/DCP++ Libraries](#) to address the problem statement.
2. Impact: The solution should have a significant impact on student learning outcomes and access to quality education. The solution should be scalable, sustainable, and have the potential to benefit a large number of students.
3. Feasibility: The solution should be technically feasible, and the proposed solution should be realistic in terms of implementation.
4. User-Friendly: The solution should be user-friendly, easy to use, and understandable for both educators and students.

JUDGING CRITERIA

1. Code quality (9 points)
2. Technical implementation (9 points)
3. Creativity & originality (9 points)

RESOURCES

VIDEOS
What is oneAPI
What is the Intel AI Analytics Toolkits
Introduction to oneDnn
oneAPI Deep Neural Networks Library Programming Model and Samples
oneAPI Video Processing Library Programming Model and Code Samples

[oneAPI Collective Communications Library](#)

[oneAPI Video Processing Library Programming Model and Code Samples](#)

[oneAPI Threading Building Blocks \(oneTBB\)](#)

[The oneAPI Math Kernel Library \(oneMKL\)](#)

[oneAPI Collective Communications Library | oneCCL](#)

[oneDPL | oneAPI DPC++ Library](#)

[Direct Programming with SYCL](#)

[\(SETUP\) The Easiest, The Simplest C++ Parallel Library, oneTBB - SpinScoped MutexLock](#)

[Making banking secure via bio metrics application built using oneAPI and DPC++ based on](#)

[SYCL/C++](#)

[Parallel C++: Concurrent Containers](#)

[CUDA to SYCL Migration Tool and Method](#)

[Data Parallel C++ \(DPC++\) Programming Model](#)

[YouTube channel from an Intel innovator follow to know more](#)

TOOLKITS & LIBRARY

[AI Reference Kit](#)

[oneAPI Deep Neural Network Library](#)

[Intel® oneAPI Threading Building Blocks](#)

[Intel® oneAPI Data Analytics Library](#)

[Intel® oneAPI Video Processing Library](#)

[Intel® oneAPI Collective Communications Library](#)

[Intel® oneAPI DPC++ Library](#)

[Intel® Optimization for TensorFlow*](#)

[Intel® Optimization for PyTorch*](#)

[Intel® Distribution for Python*](#)

[Intel® Extension for Scikit-learn](#)[Intel® Neural Compressor](#)

HANDS-ON WORKSHOPS

Live Hands-on Workshops	Date
Accelerate AI workloads with Intel® oneDNN & oneDAL	19th April (5-7 PM)
Solving Operating System Concepts with SYCL	26th April (5-7 PM)