

## **Stable-ML-Education-Grant-Proposal**

### **Introduction:**

Machine Learning (ML) education is currently facing a major challenge where the course planning and adoption rates are much slower than the changes that occur yearly with cloud ML platforms and new microcontrollers. This rapid change puts ML educators in an arduous situation where their code is constantly being deprecated, or a new board can be purchased that is much better, faster, lower energy, and cheaper but needs completely different lesson plans. To address this challenge, we propose to design an open-source, course based on TensorflowJS web-based JavaScript ML with Web Serial to connect any microcontroller to a desktop computer over the easy to program serial interface that all microcontrollers provide.

### **Problem:**

The changes in microcontrollers and cloud ML platforms occur at a faster pace than the course planning and adoption rates in ML education. This creates considerable educator stress when their hard to design course content is outdated and may not align with the current state of the art. Additionally, students may find it difficult to work with outdated technologies or platforms that are no longer supported. This affects the overall quality of education in ML and causes student frustration or students being forced to learn old or unsupported technologies.

### **Objective:**

The main objective of this grant application is to provide support for General University and High School ML education to design and implement an open-source course based on TensorflowJS web-based JavaScript with Web Serial connectivity. The proposed open-source course will provide a stable foundation for educators to teach machine learning concepts about future tinyML, while also allowing students to work with the latest technologies and tools in cloud platforms and new microcontrollers. With a focus on methodology and concepts, the course will equip students with the skills and knowledge needed to adapt to changing technologies and stay ahead of the curve in this rapidly evolving field. Additionally, the course will provide a solid foundation that does not rely solely on the latest technologies, ensuring that educators can still effectively teach machine learning concepts even if they don't have access to the most cutting-edge tools.

**Funding: Requesting >= \$20,000.00 USD per year**

The grant funding will be used for 4 main activities that will be determined each year by the General University and High School ML education committee. The first year's funding will mainly be for the first two steps, while later years will provide support for the last two steps.

1. Get educators together in person to plan and code the program.
2. Pay TensorflowJS, web-serial and web developer programmers as needed.
3. Promote the program to schools and universities.
4. Provide feedback to the ML community, cloud services, microcontroller manufacturers, and others in the ML industry about how their products can support "General University and High School ML education."

**Expected Outcome:**

The proposed open-source course will provide stable and flexible ML education to General University and High School students, allowing them to learn the technologies and tools related to machine Learning. The open-source course will also help educators keep up with the changes in the field and provide feedback to the ML community, cloud services, microcontroller manufacturers, and others in the ML industry. The grant funding will ensure the sustainability of the program, allowing it to grow and adapt to the changes in the field.

**Conclusion:**

We believe that the proposed open-source course will provide a stable and up-to-date ML education to General University and High School students, filling the gap that currently exists in the field. The grant yearly funding will ensure the sustainability of the program, allowing it to grow and adapt to the changes in the field. We hope that this grant application will receive positive consideration from the foundation. Thank you for your attention.

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