INSTITUTO FEDERAL
SÃO PAULO
Câmpus Cubatão

IFSP- TinyML: Aprendizado de Máquina Embarcado

Introdução ao Edge Impulse

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Conceito

O que é Tiny Machine Learning (TinyML)?

- TinyML é o conjunto de tecnologias em ML e sistemas embarcados para fazer uso de aplicações inteligentes em dispositivos de consumo reduzido.
- É comum que esses dispositivos possuam limitação de memória e recursos computacionais, todavia, esses dispositivos utilizam sensores para monitorar o ambiente físico, e agem por meio das decisões tomadas por algoritmos de ML.
- No TinyML, ML e a plataforma de implementação precisam trabalhar juntas para garantir uma boa aplicação de TinyML.

Resumo

O que é Edge Impulse?

- O Edge Impulse é uma plataforma proposta para o aprendizado de máquina, e prepara os desenvolvedores para a criação e otimização de soluções com dados reais.
- Facilita e agiliza a parte de criar e implantar aplicativos de Machine Learning (ML) incorporados, e por isso, torna os dispositivos mais inteligentes.

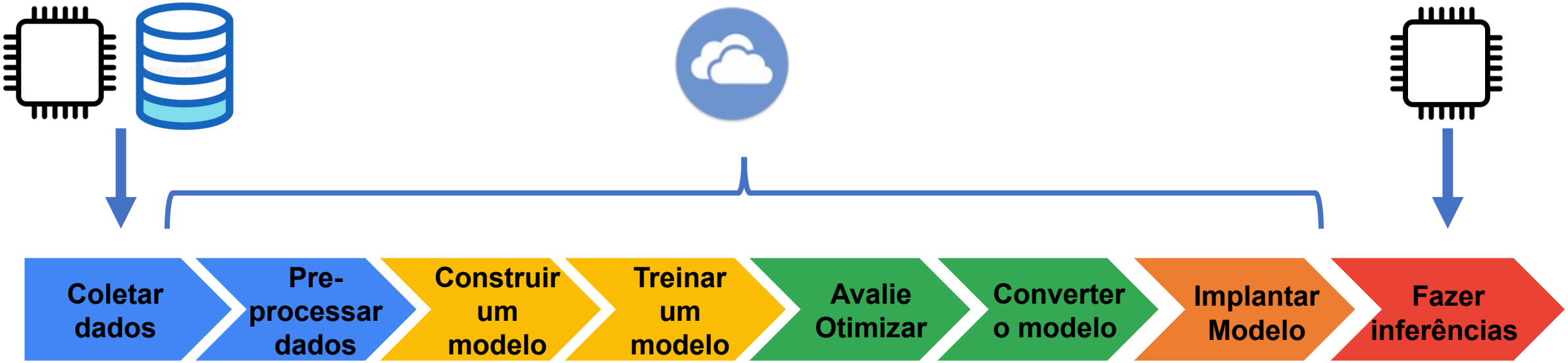
Fluxo de trabalho do Machine Learning

Introdução

Tiny Fluxo de trabalho do Machine Learning (“O Que”)

Introdução

Fluxo de trabalho do Machine Learning (“Onde”)



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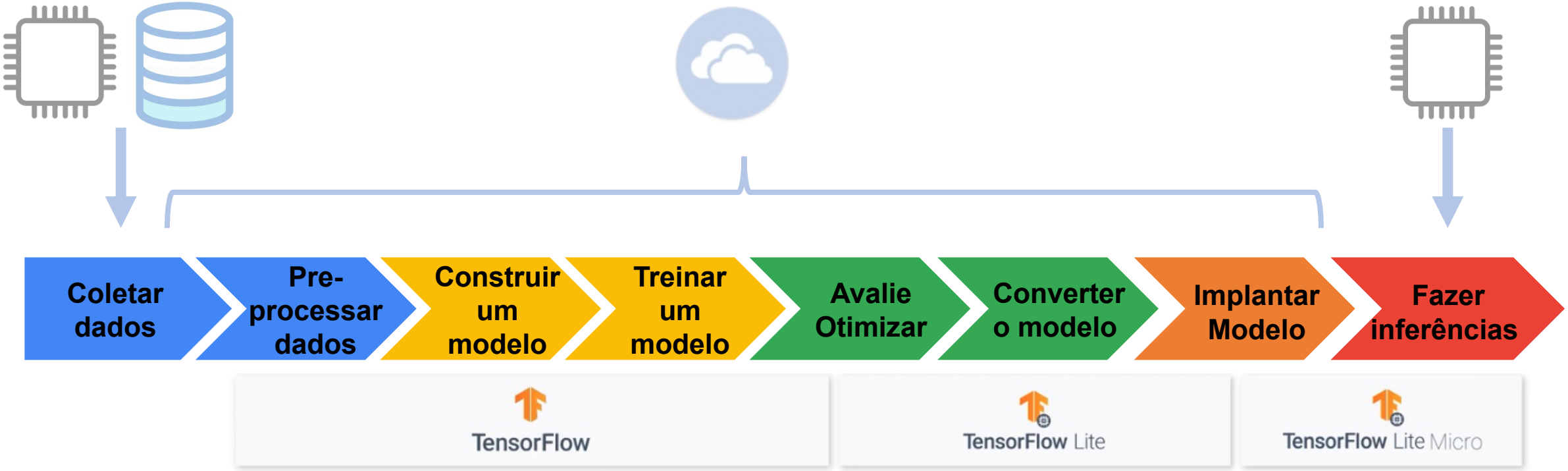
Fluxo de trabalho do Machine Learning (“Como”)



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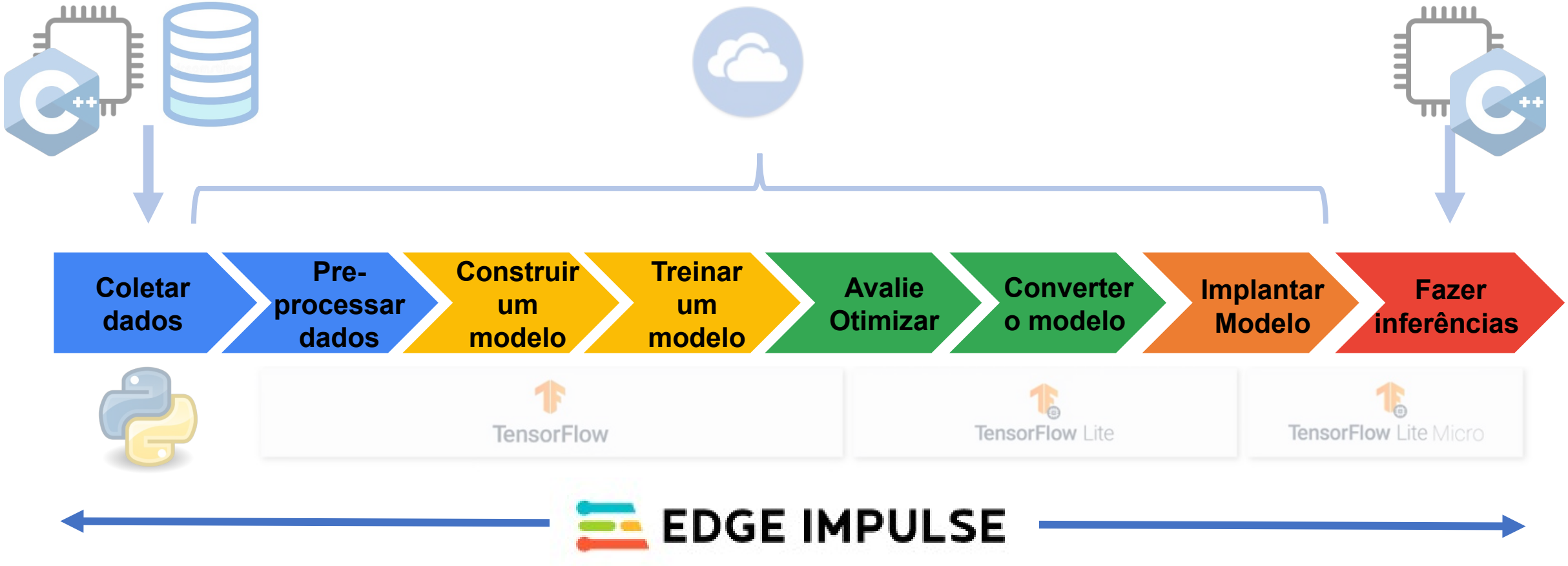

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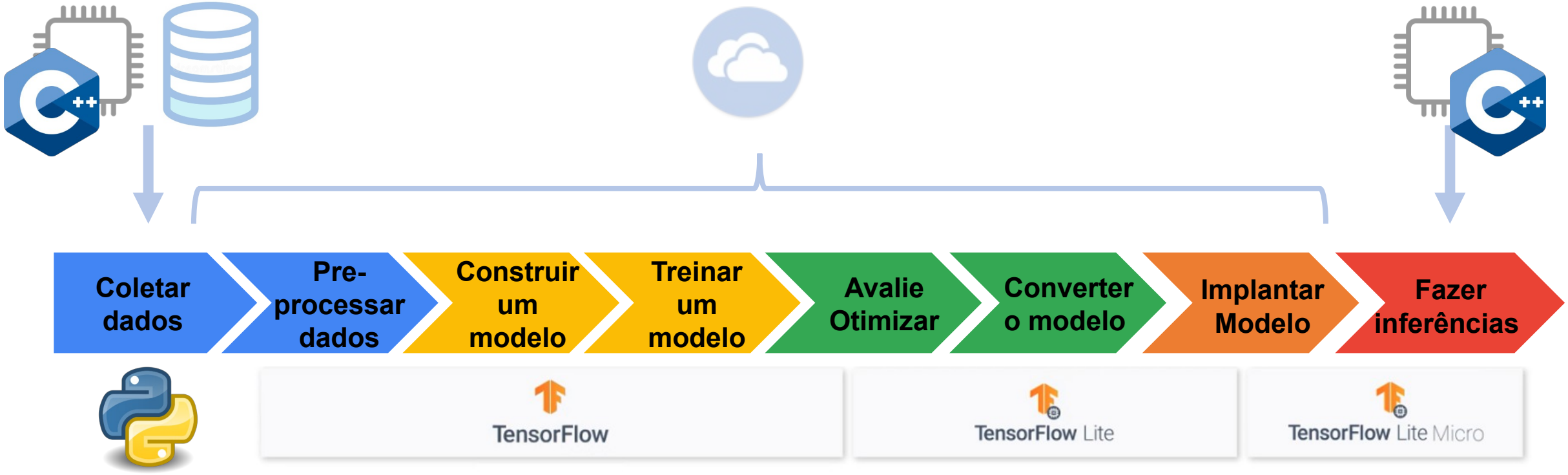
Fluxo de trabalho do Machine Learning (“Como”)



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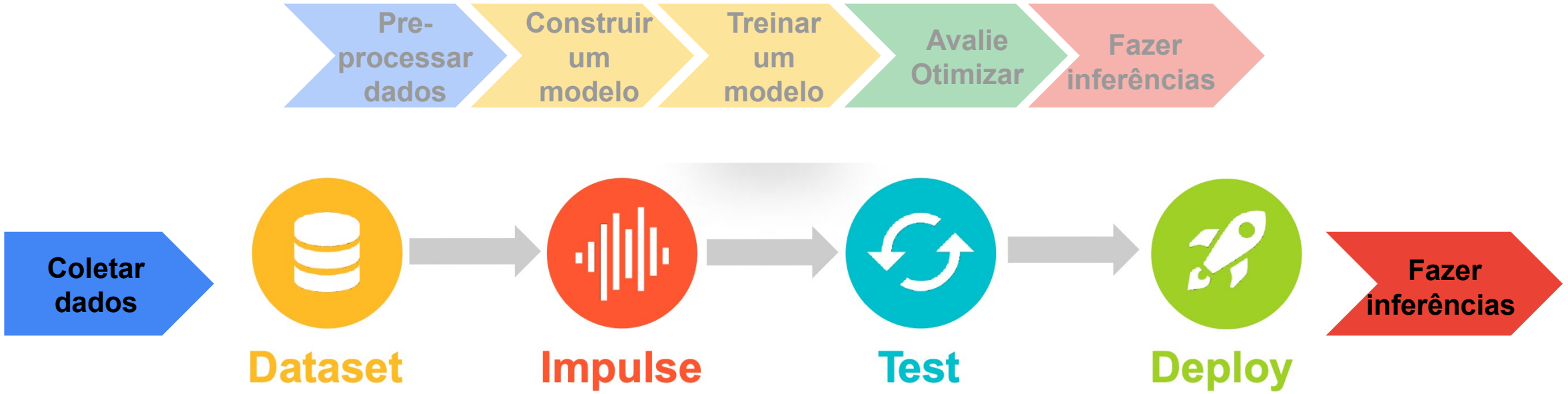
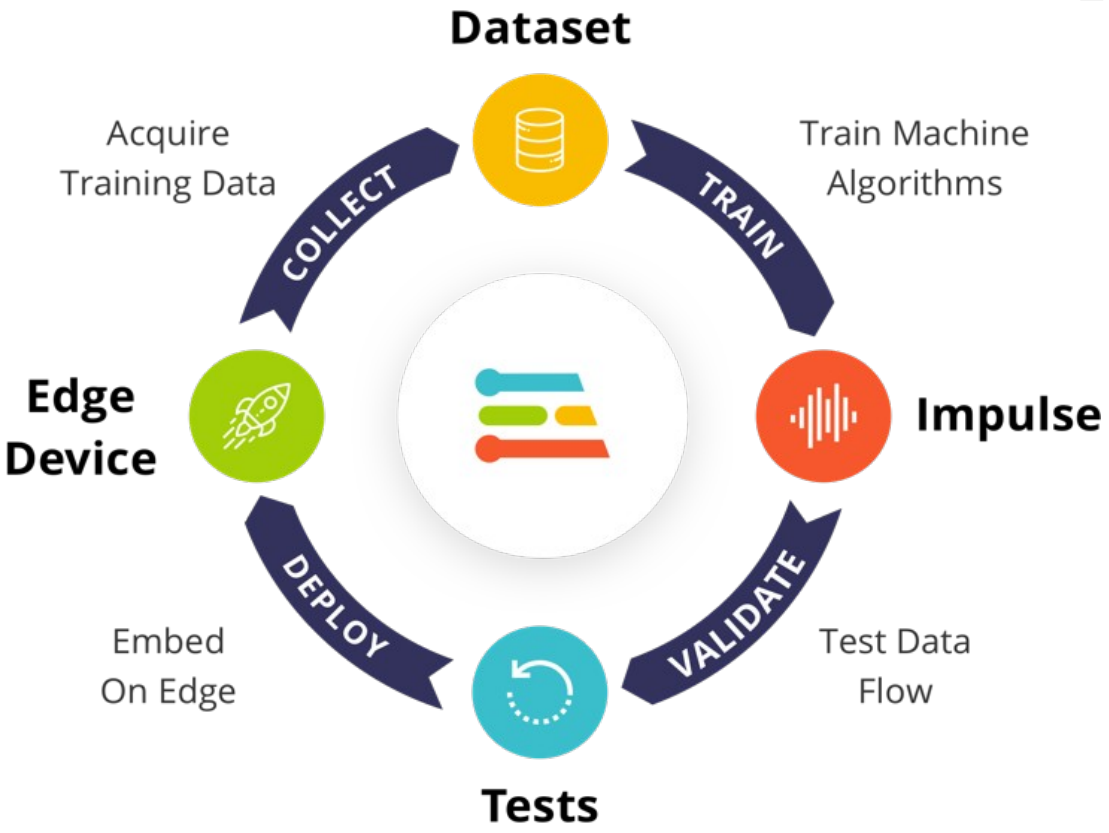

Pre-processar dados
Construir um modelo
Treinar um modelo
Avalie Otimizar
Fazer inferências
Coletar dados
Dataset
Impulse
Test
Deploy
Fazer inferências

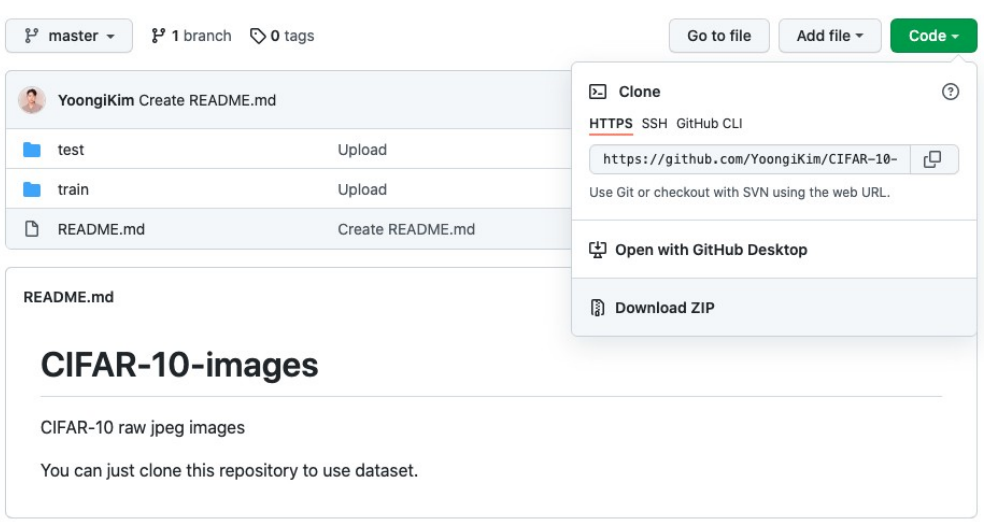
Edge Impulse

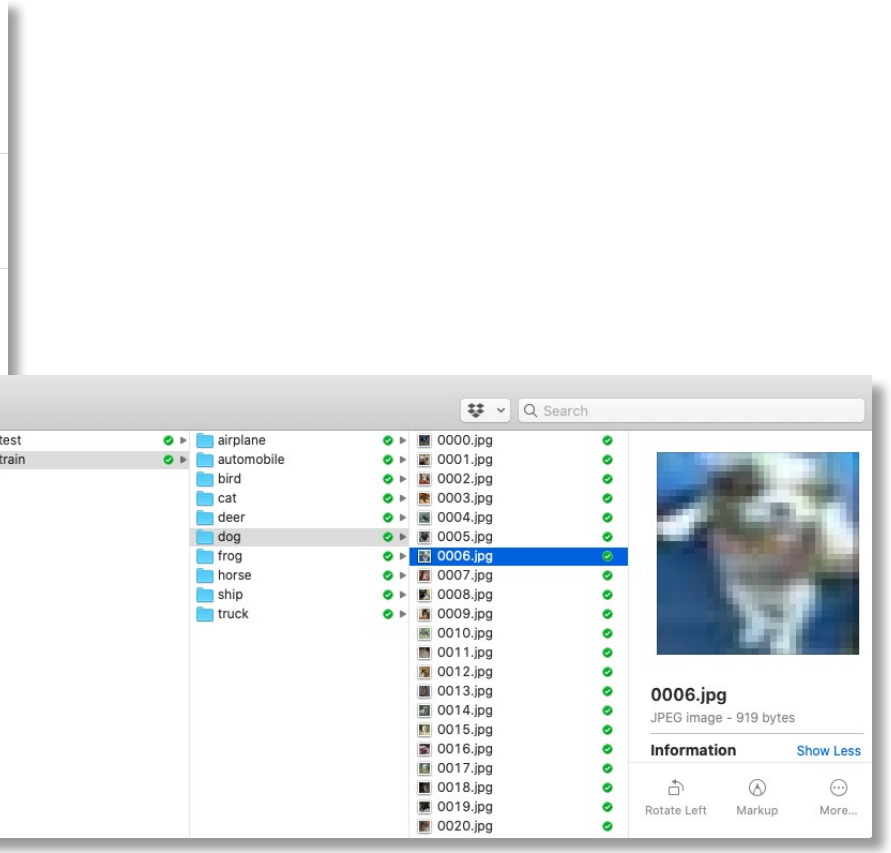
Acessando a plataforma Edge Impulse

Link: https://www.edgeimpulse.com/



GitHub



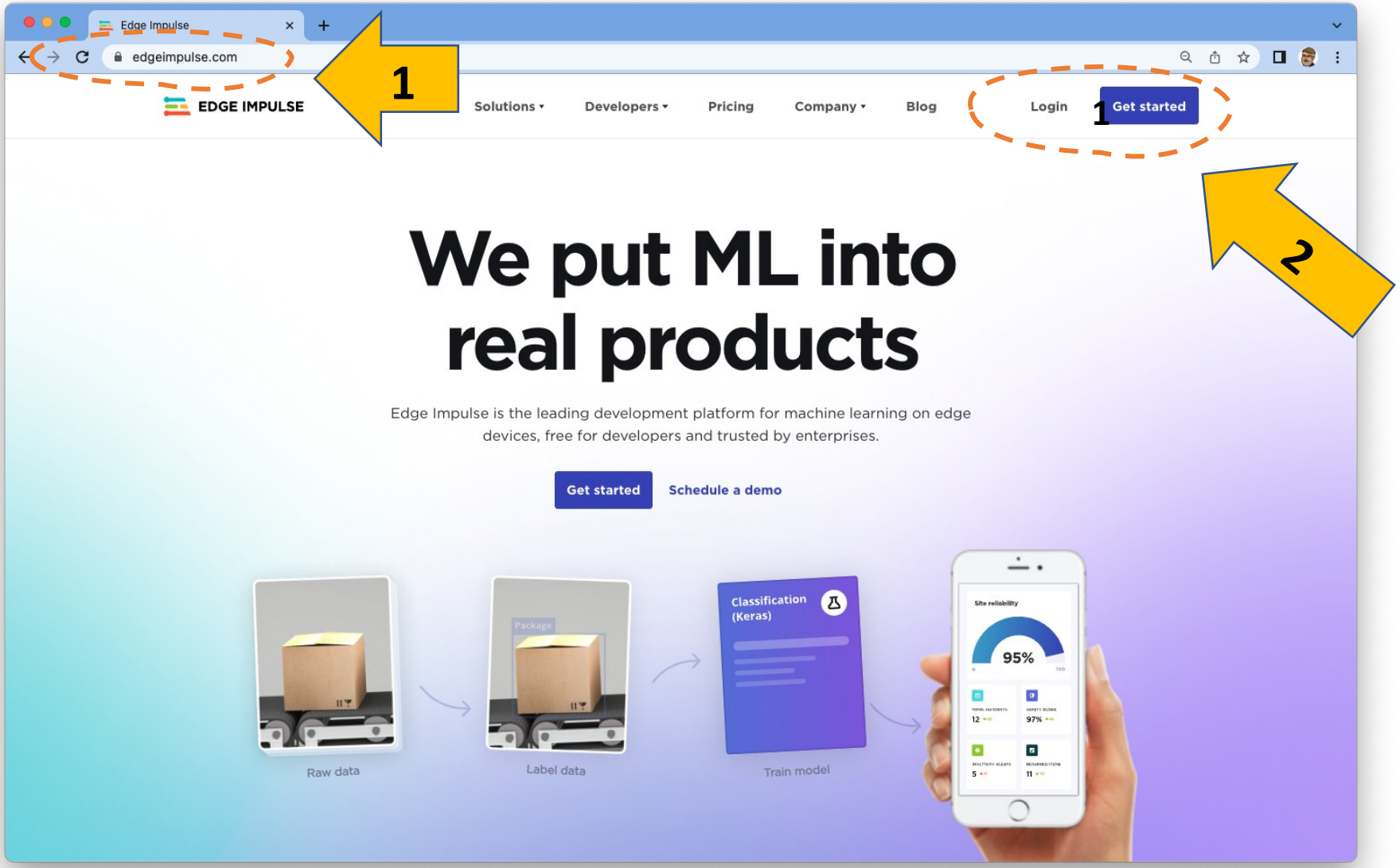


Acessando o GitHub

Link Dataset:

https://github.com/YoongiKim/CIFAR-10-images

Edge Impulse



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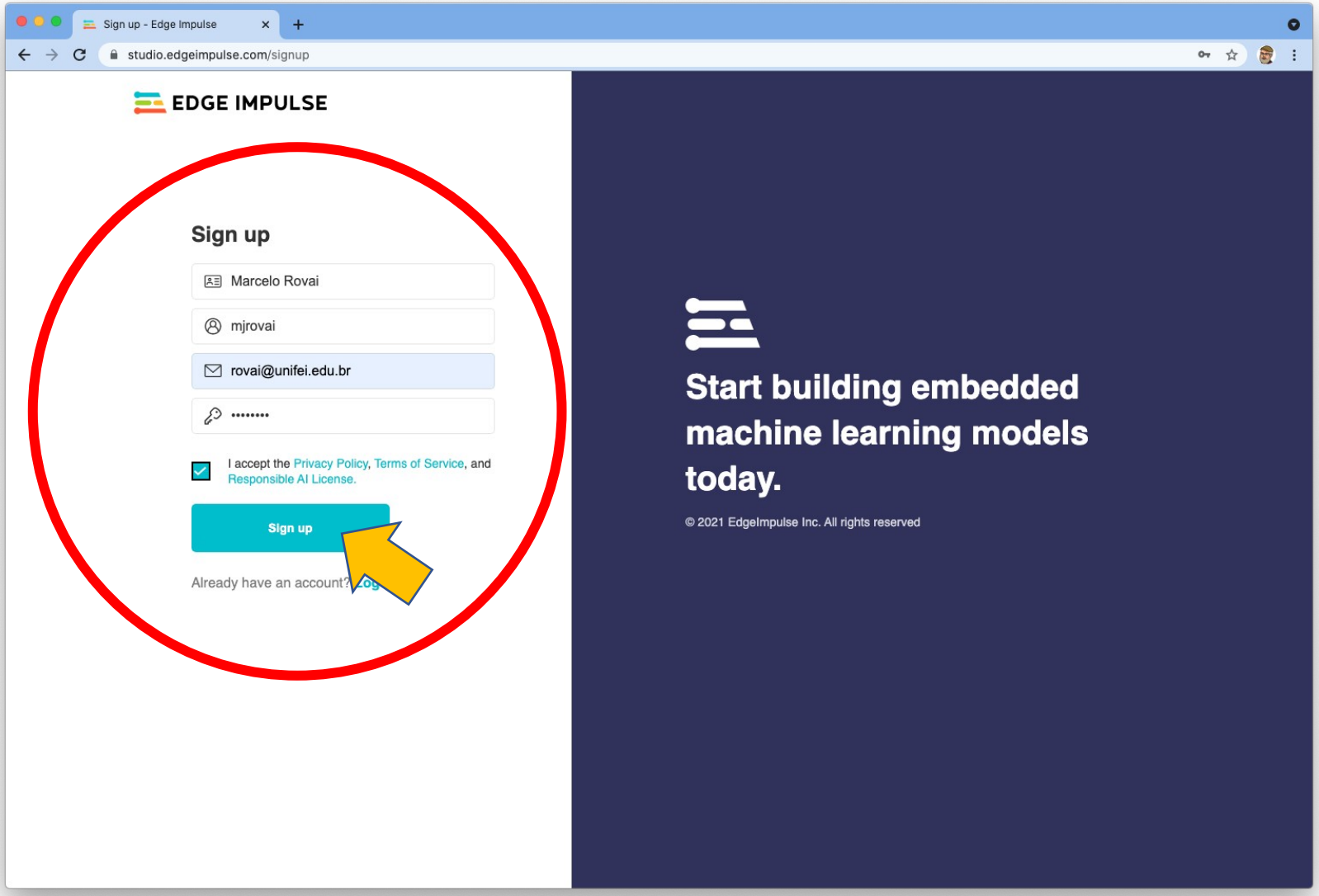

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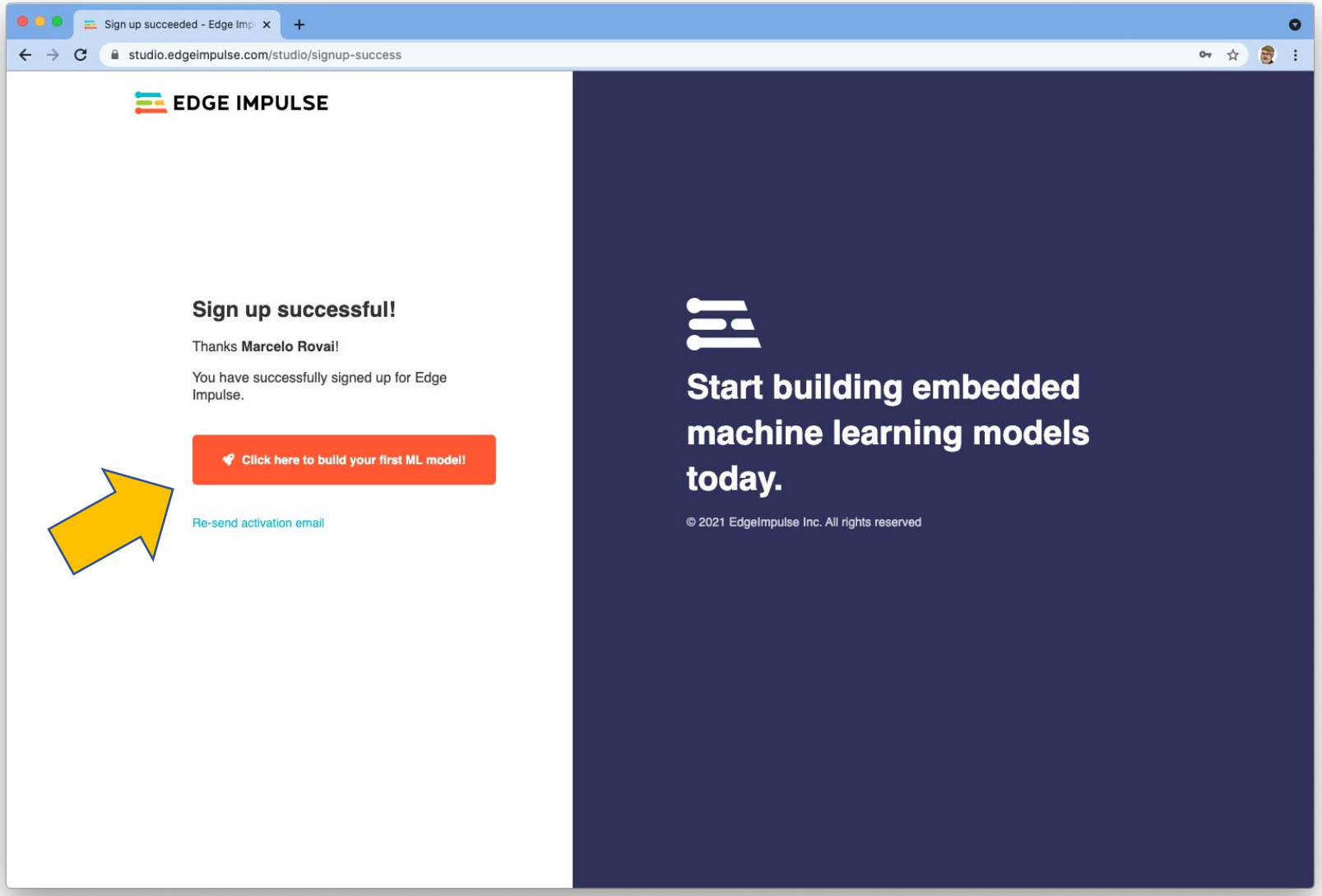

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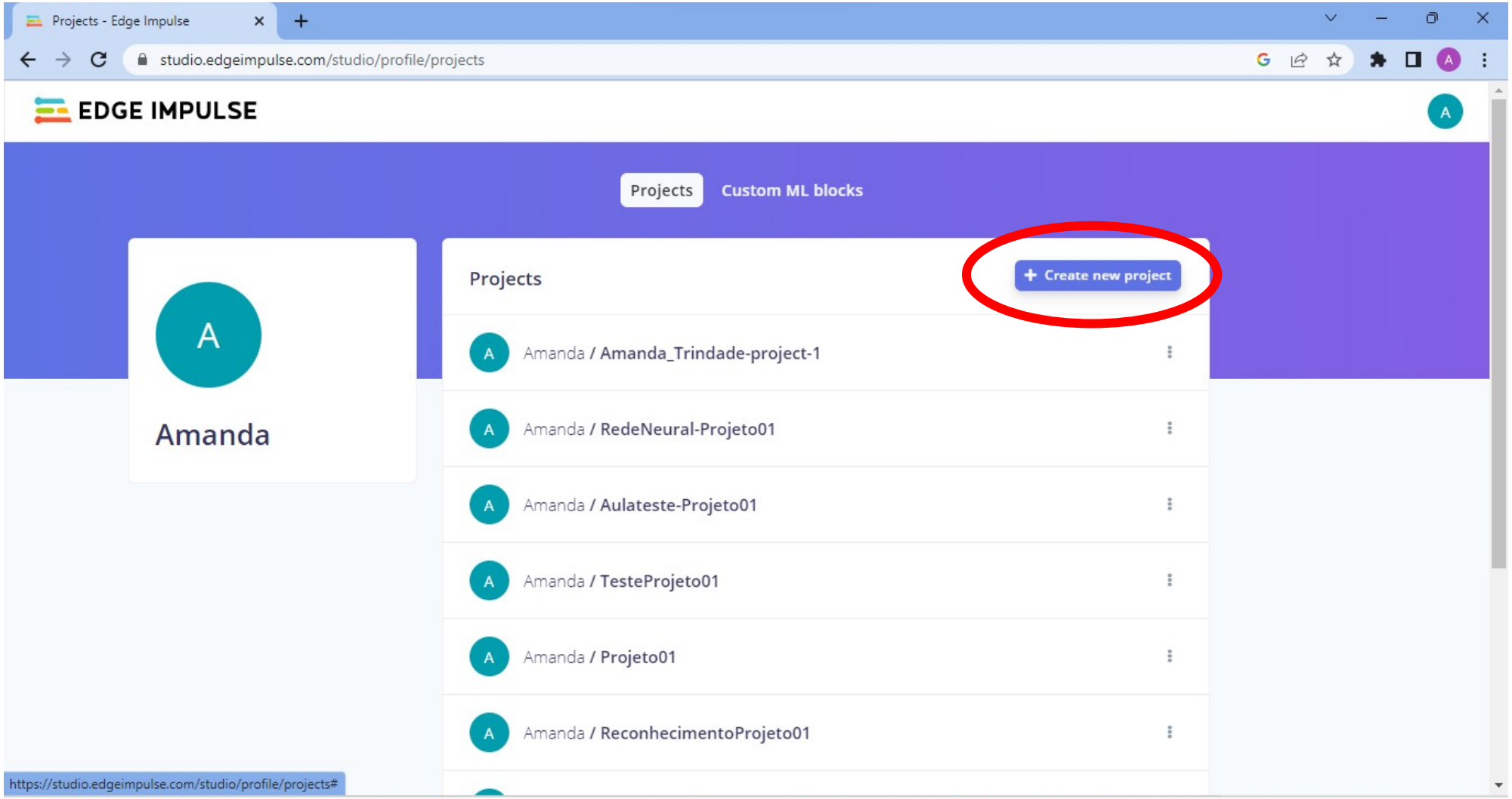

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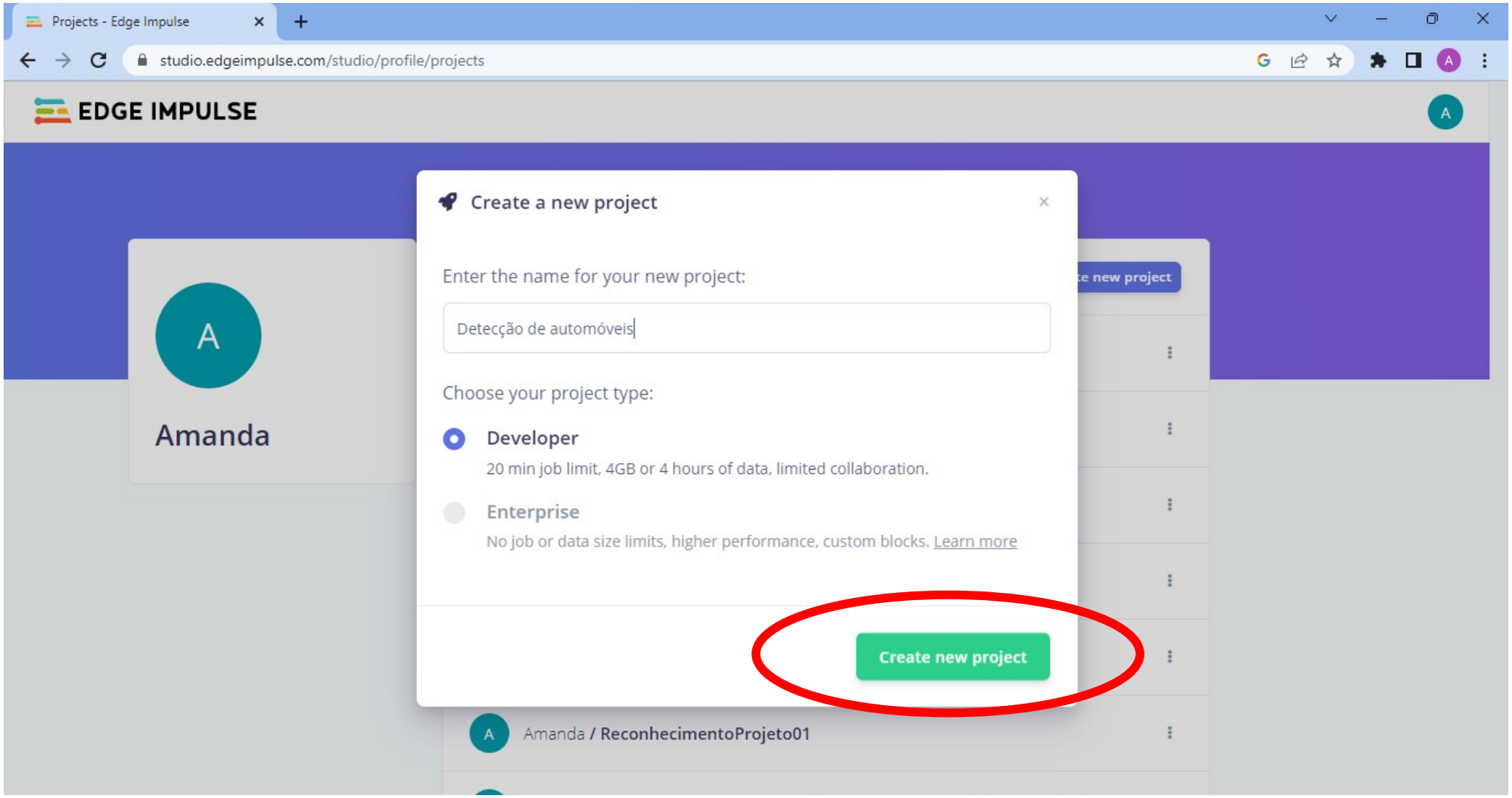

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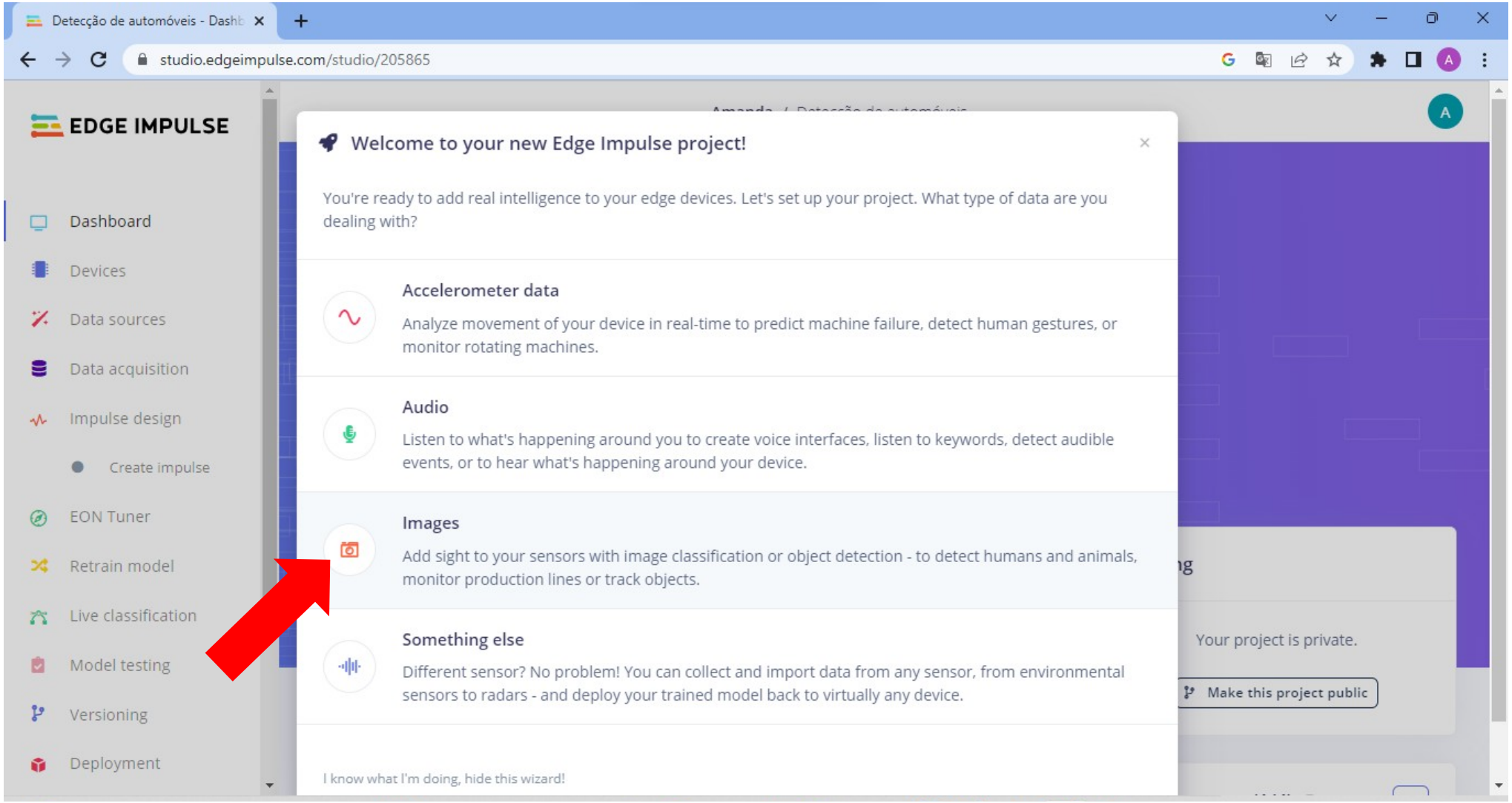

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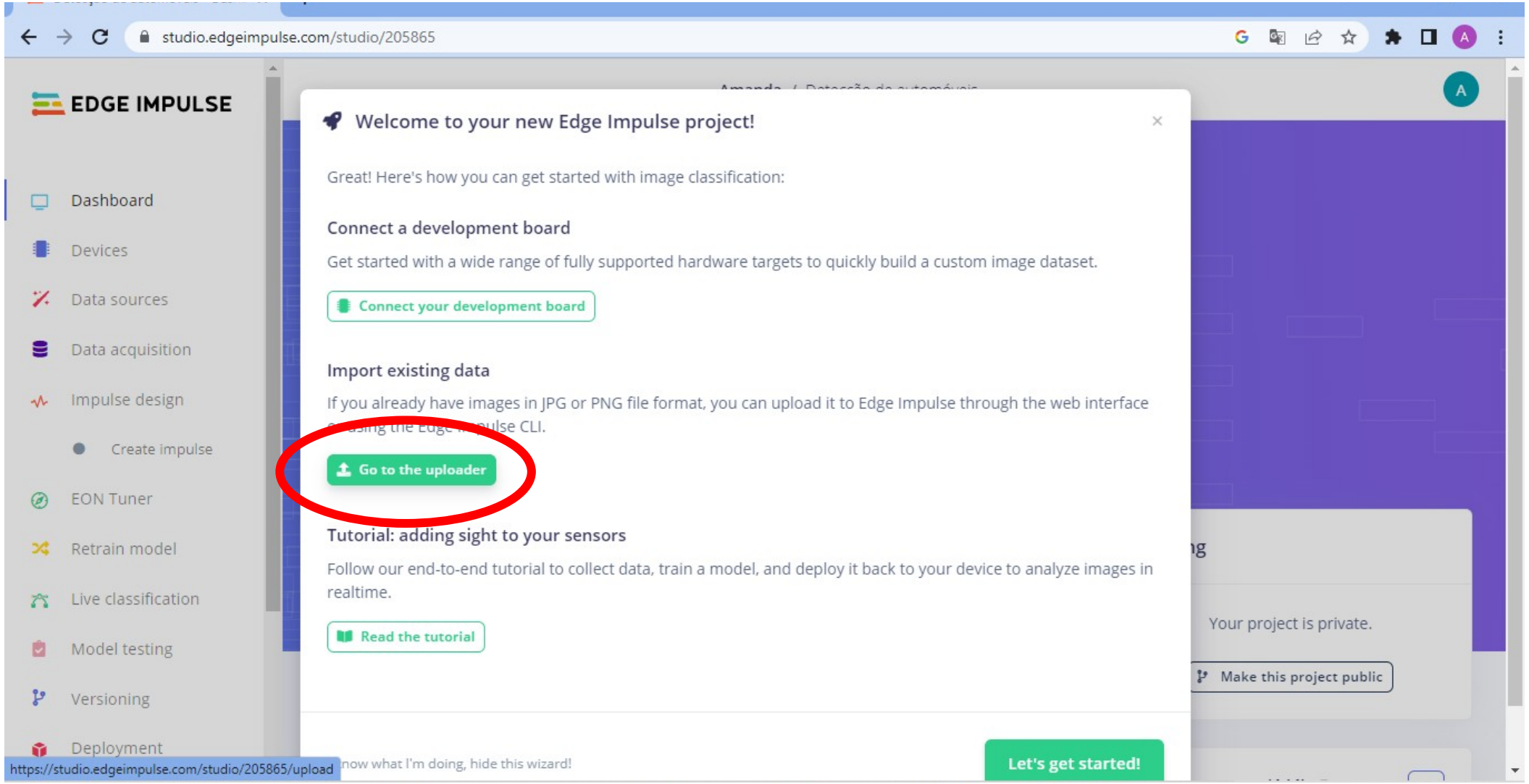

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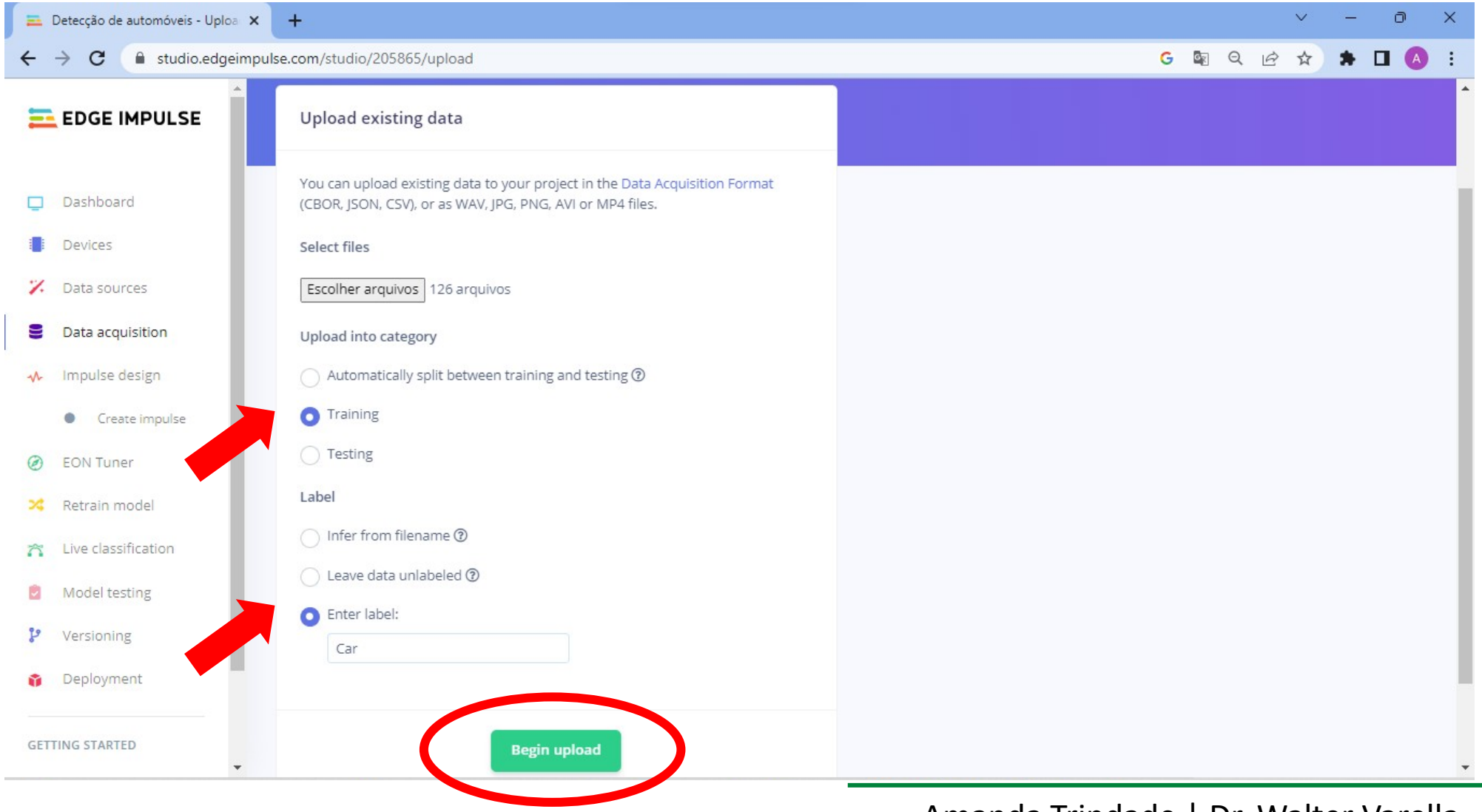

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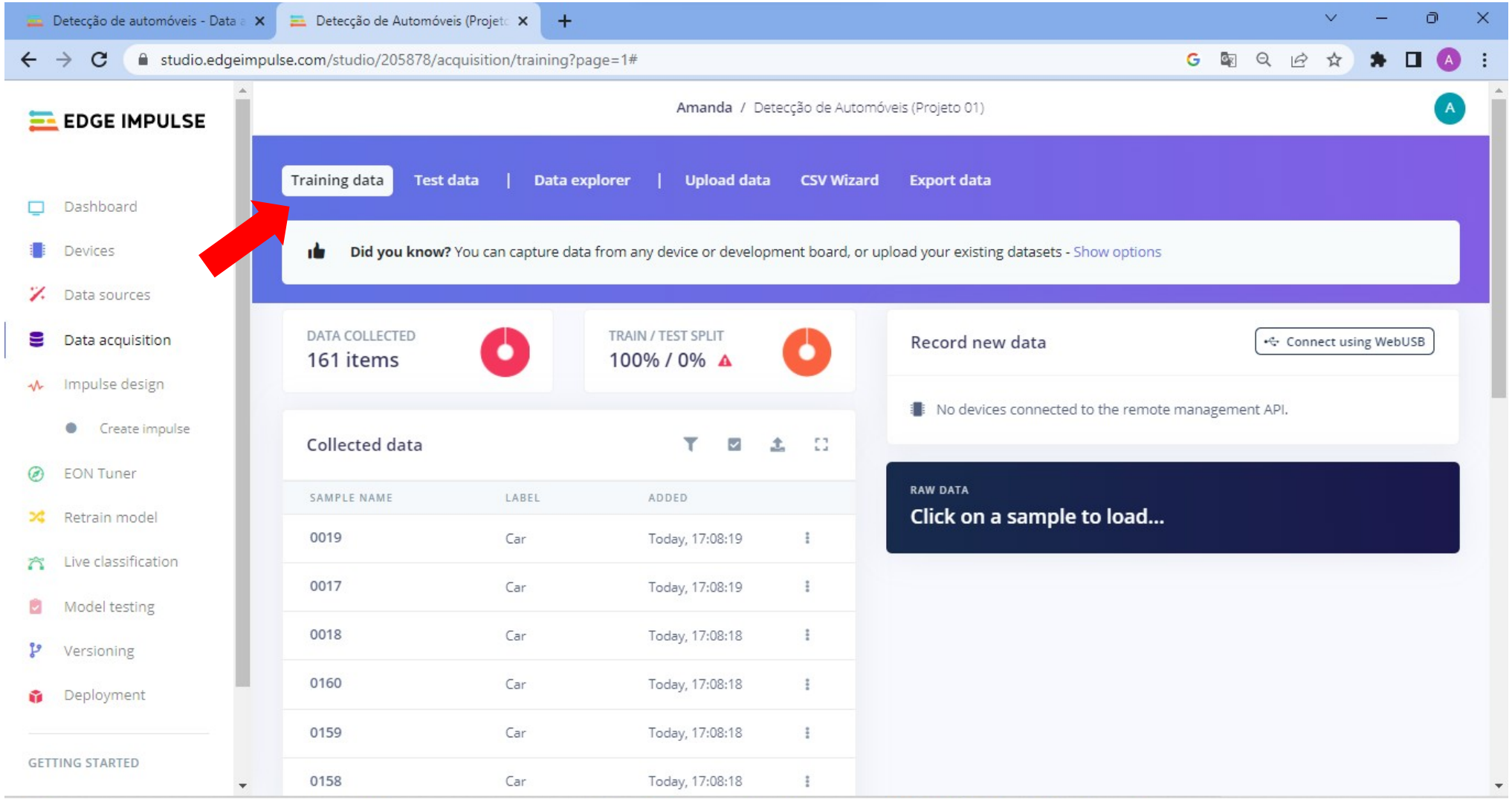

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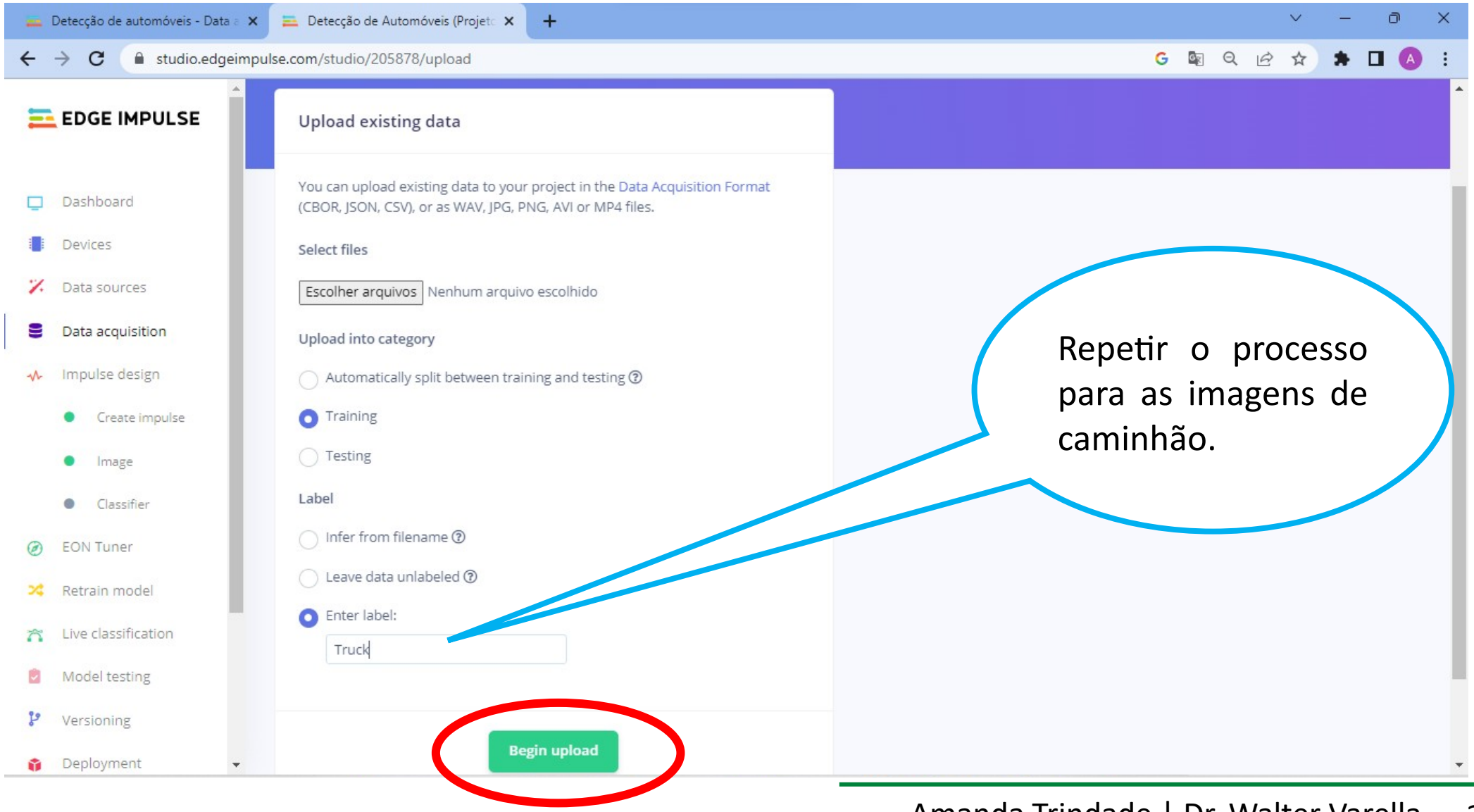

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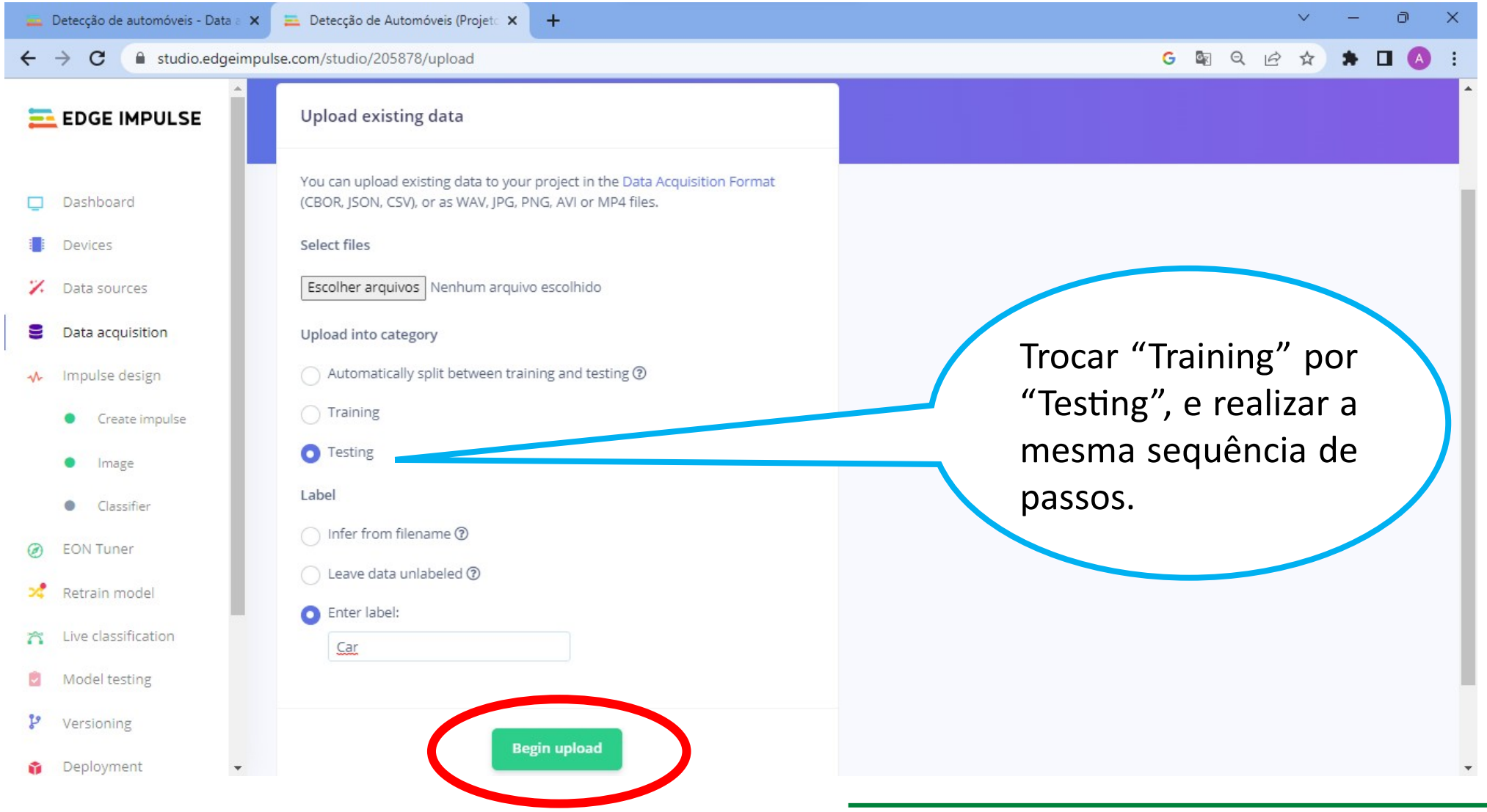
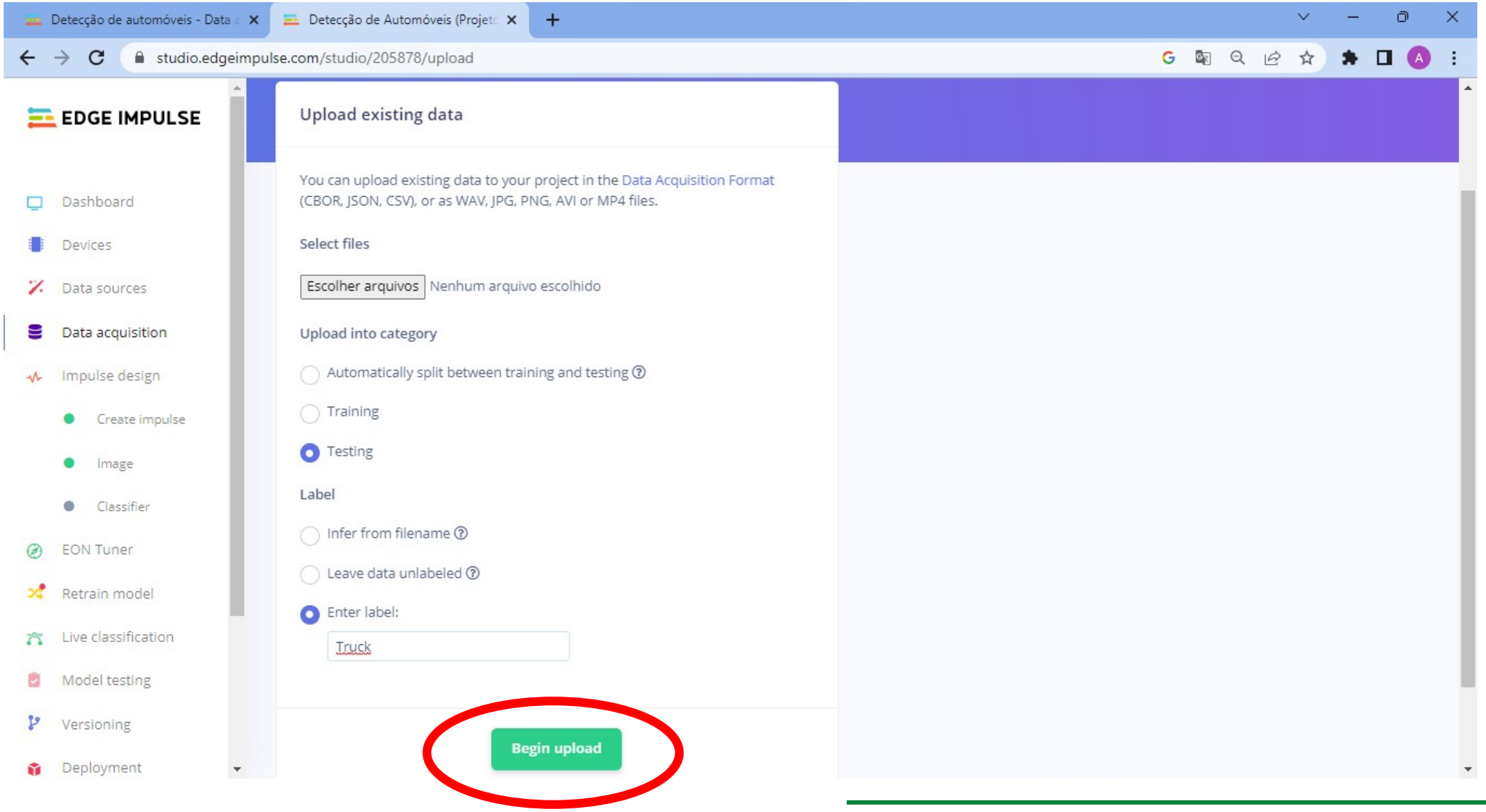


Trocar “Training” por “Testing”, e realizar a mesma sequência de passos.

Edge Impulse



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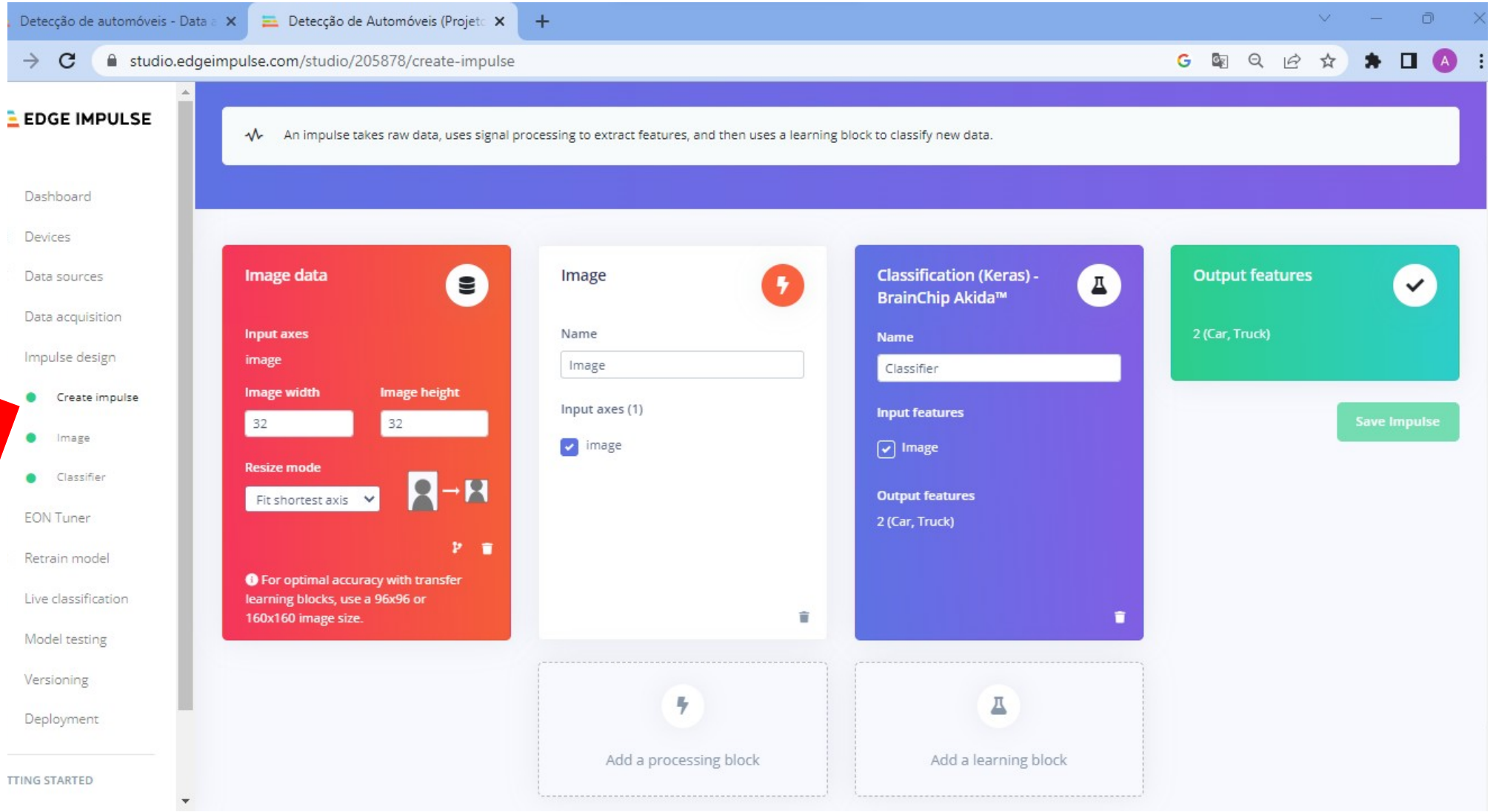

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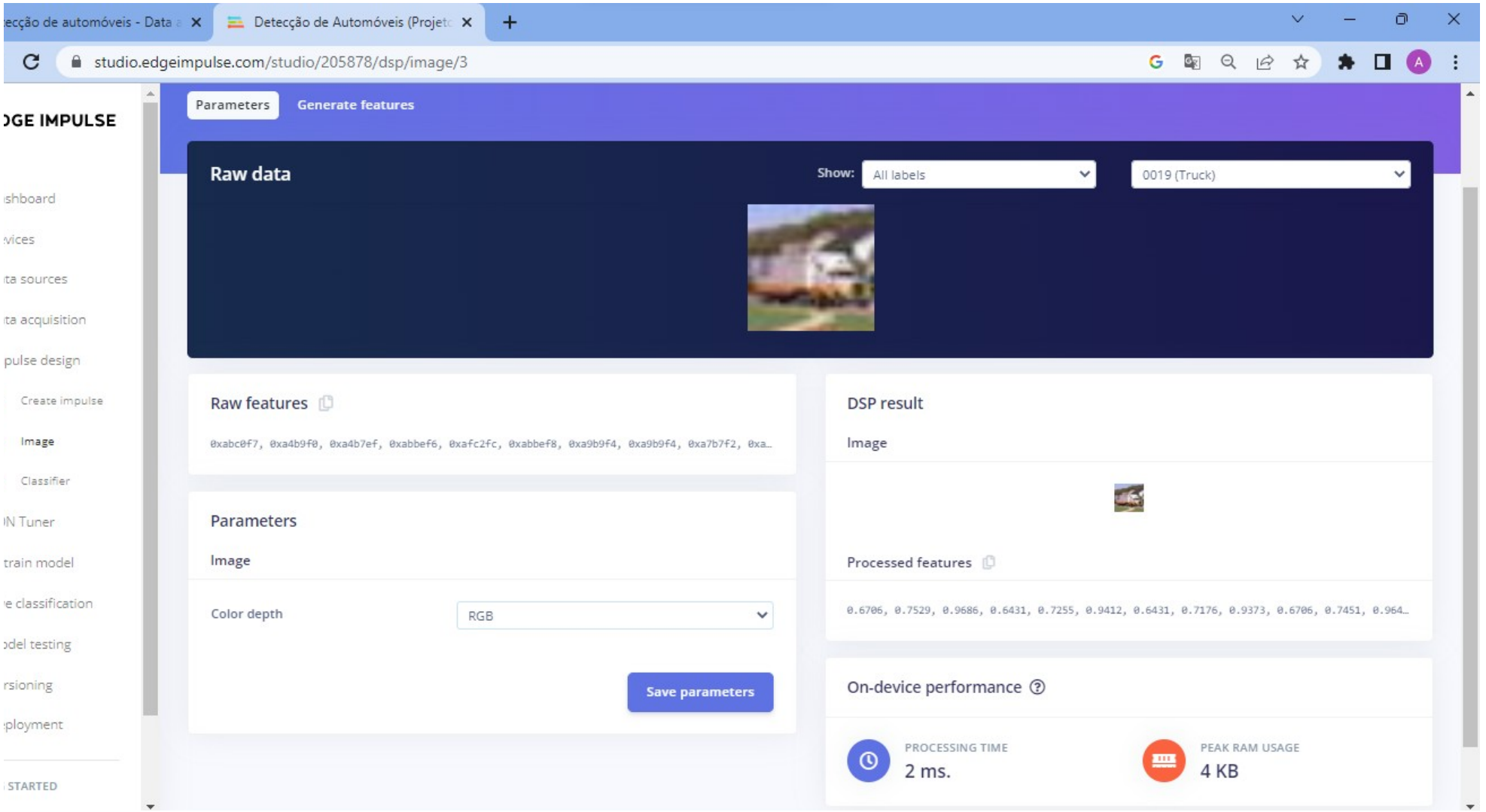

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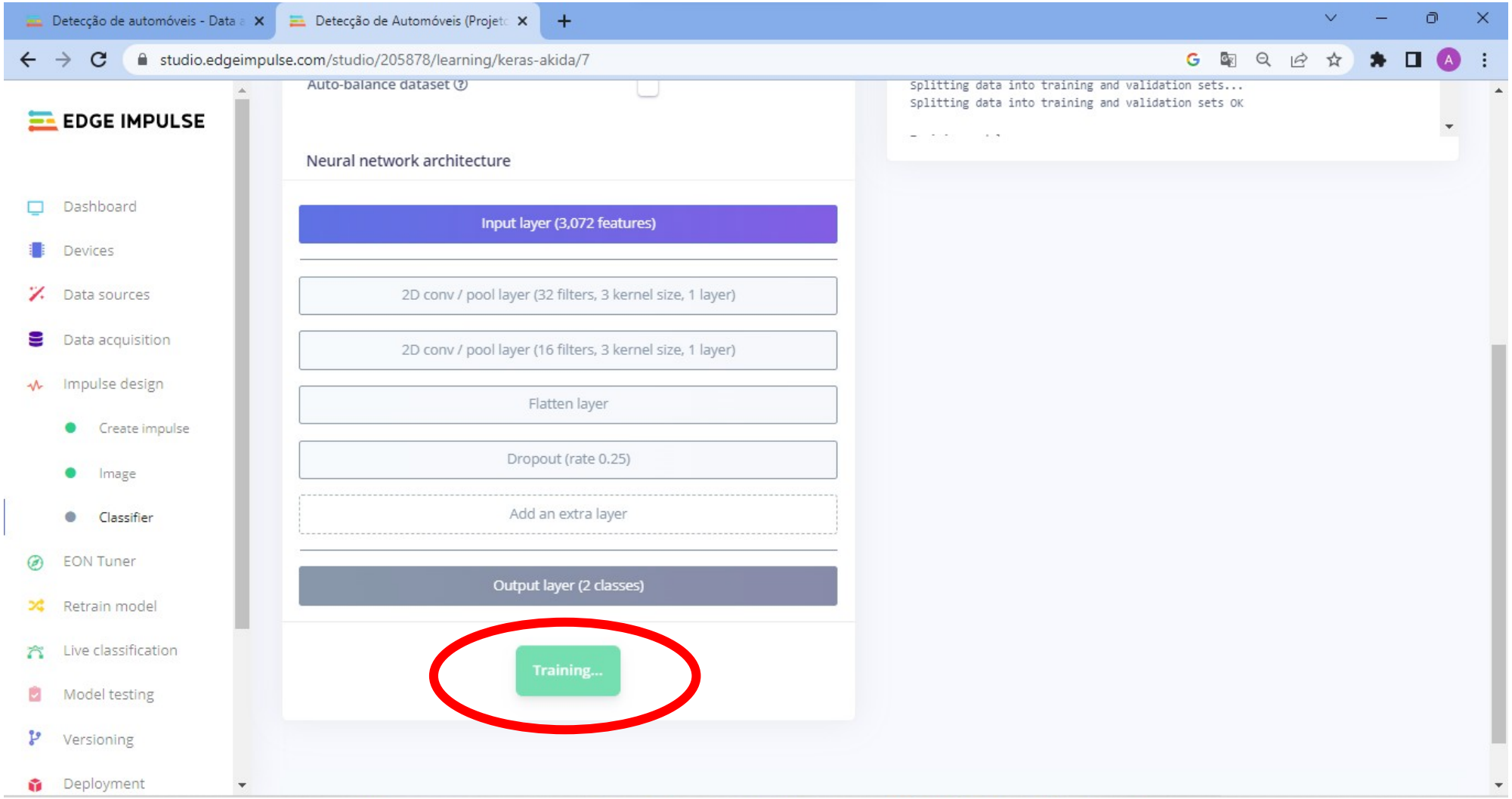

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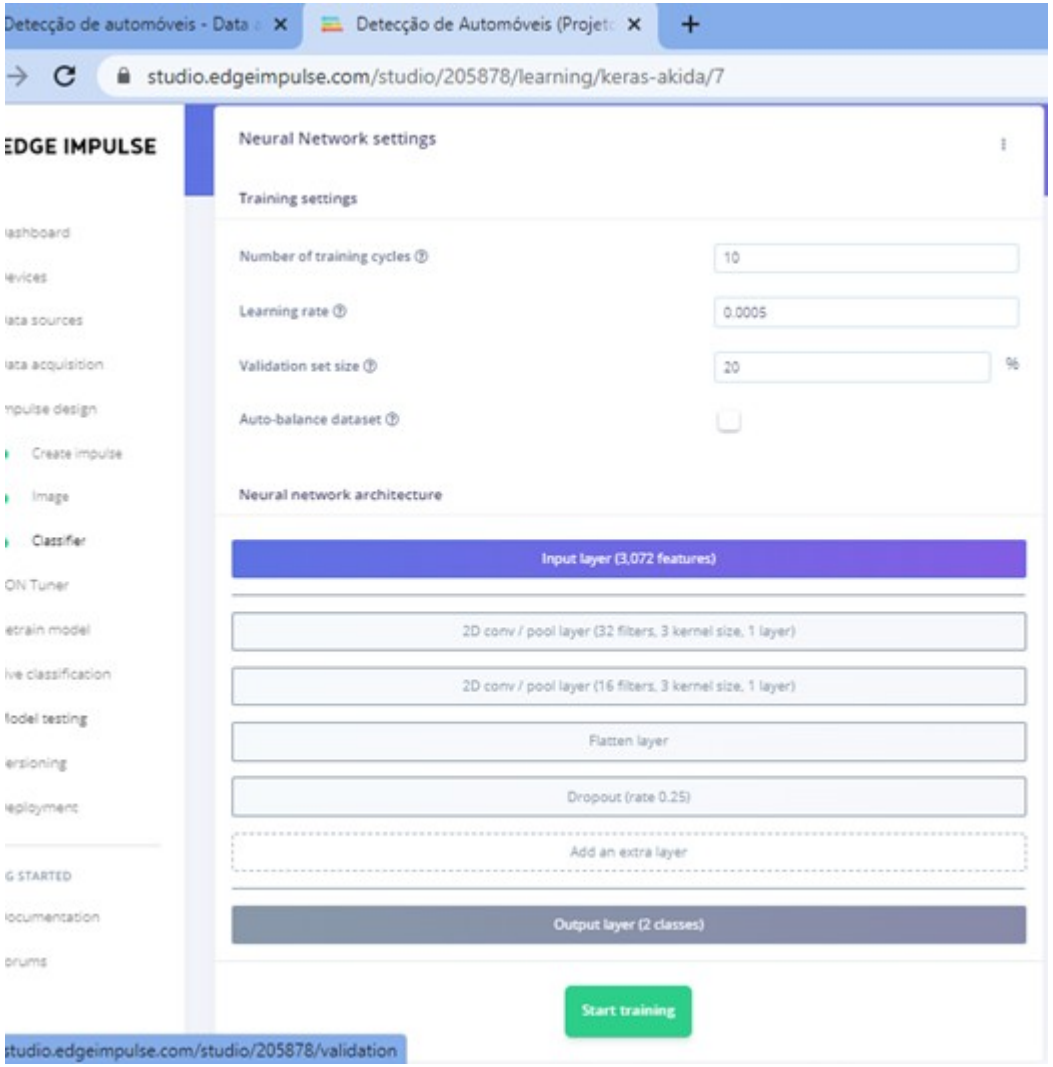
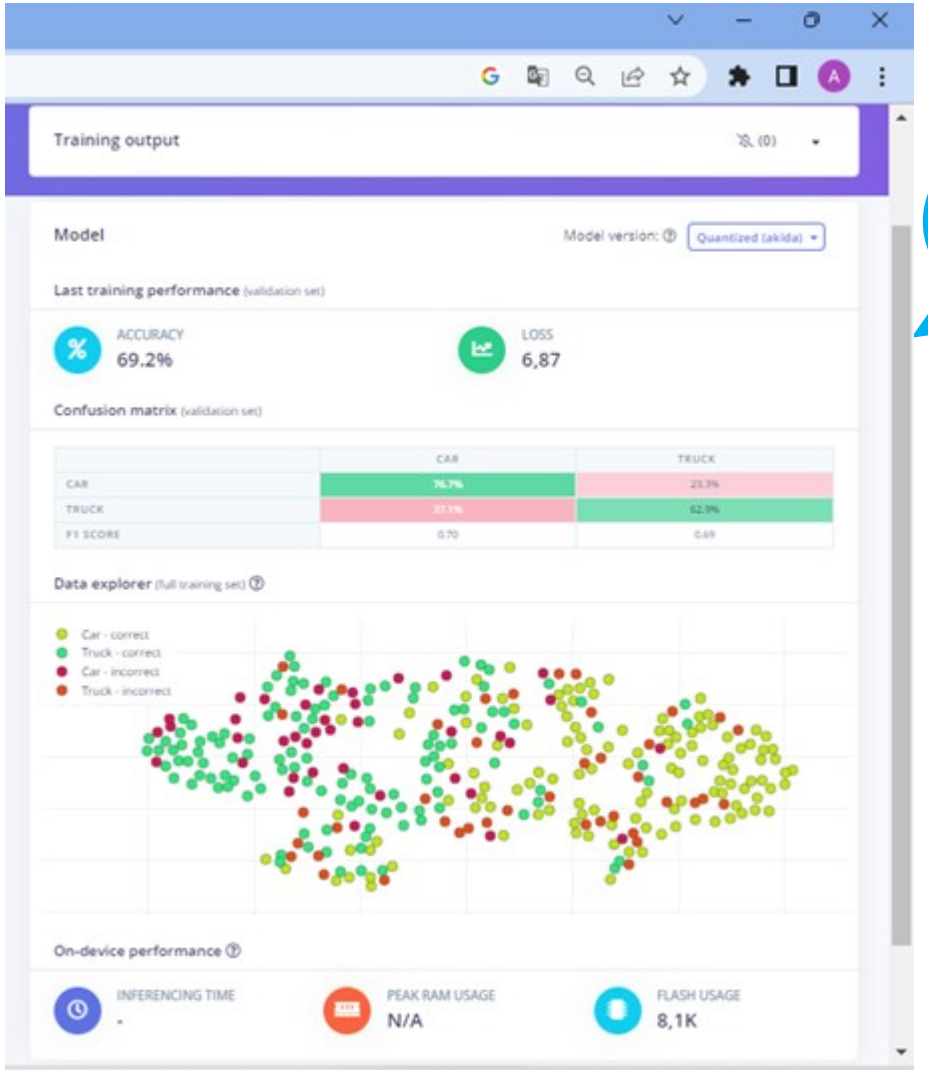
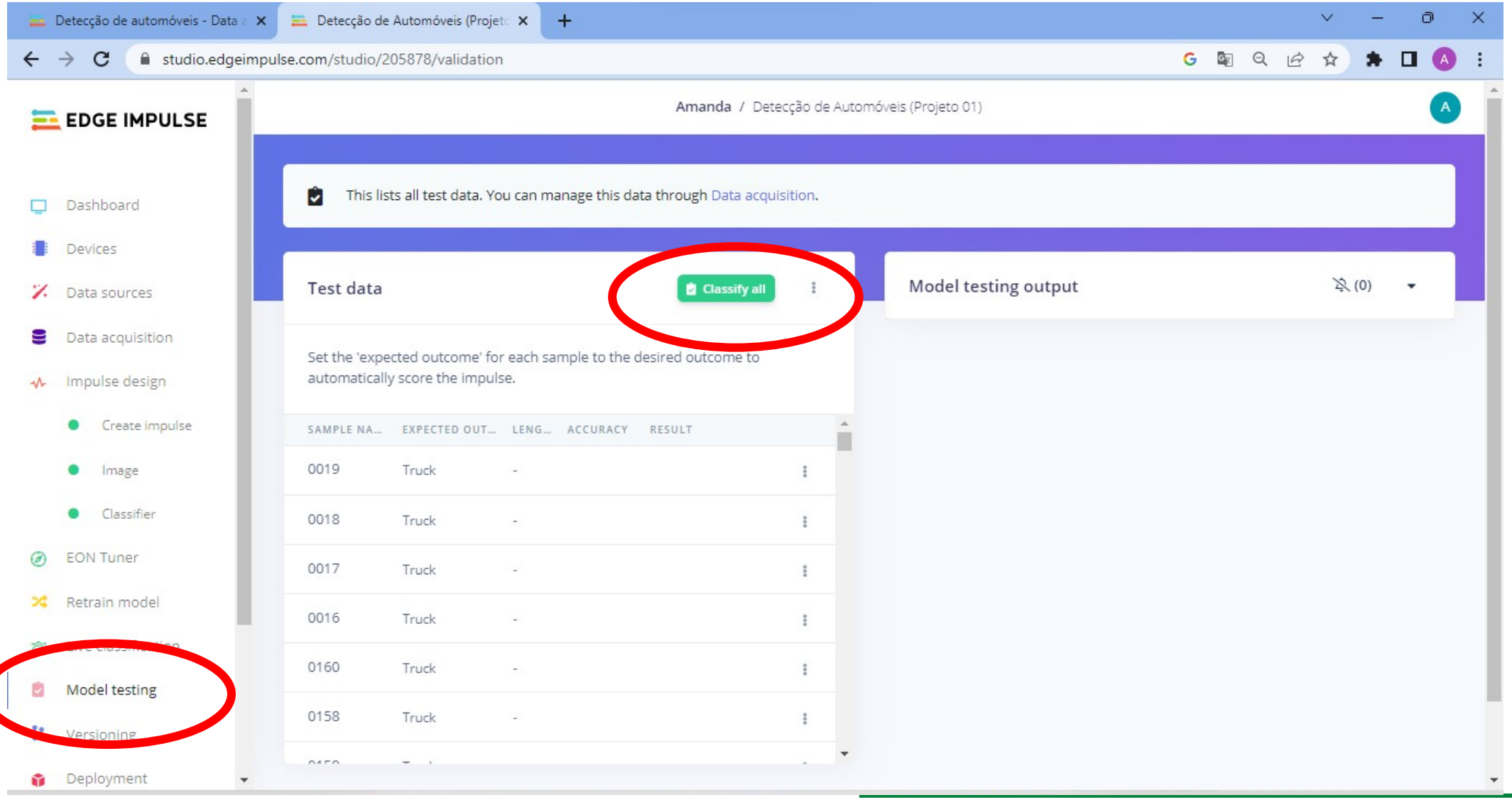




Essa será a tela gerada.

Edge Impulse



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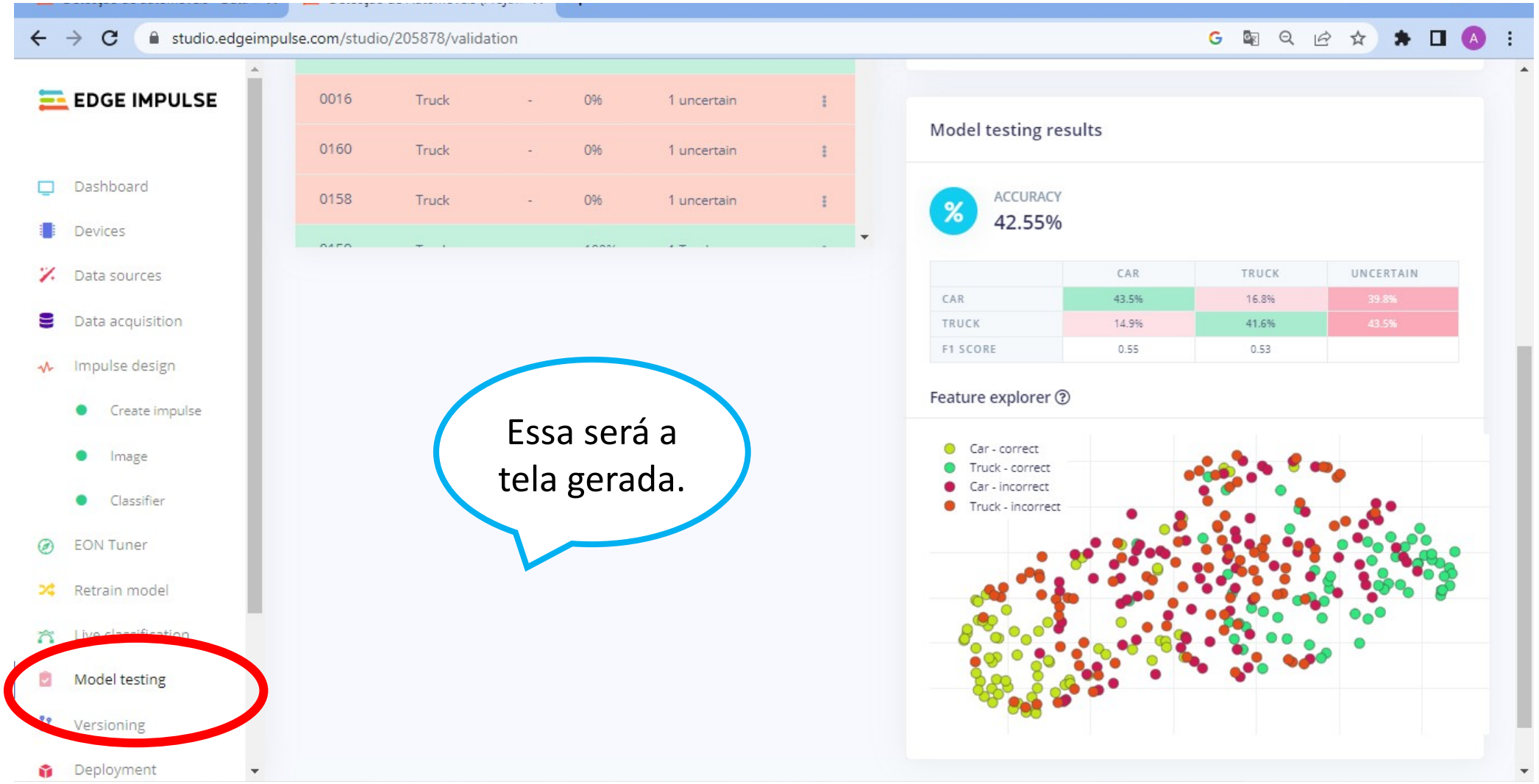

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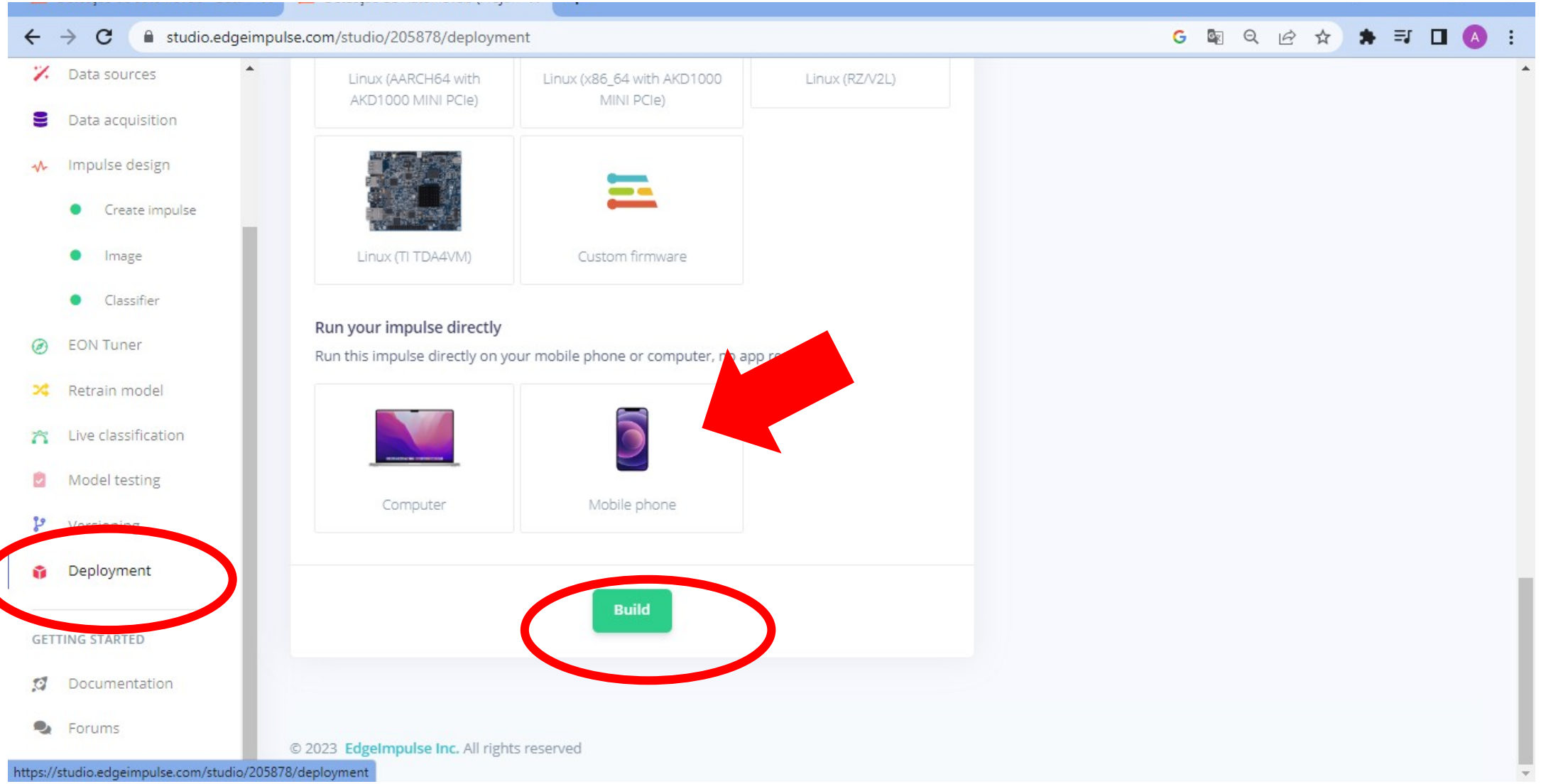

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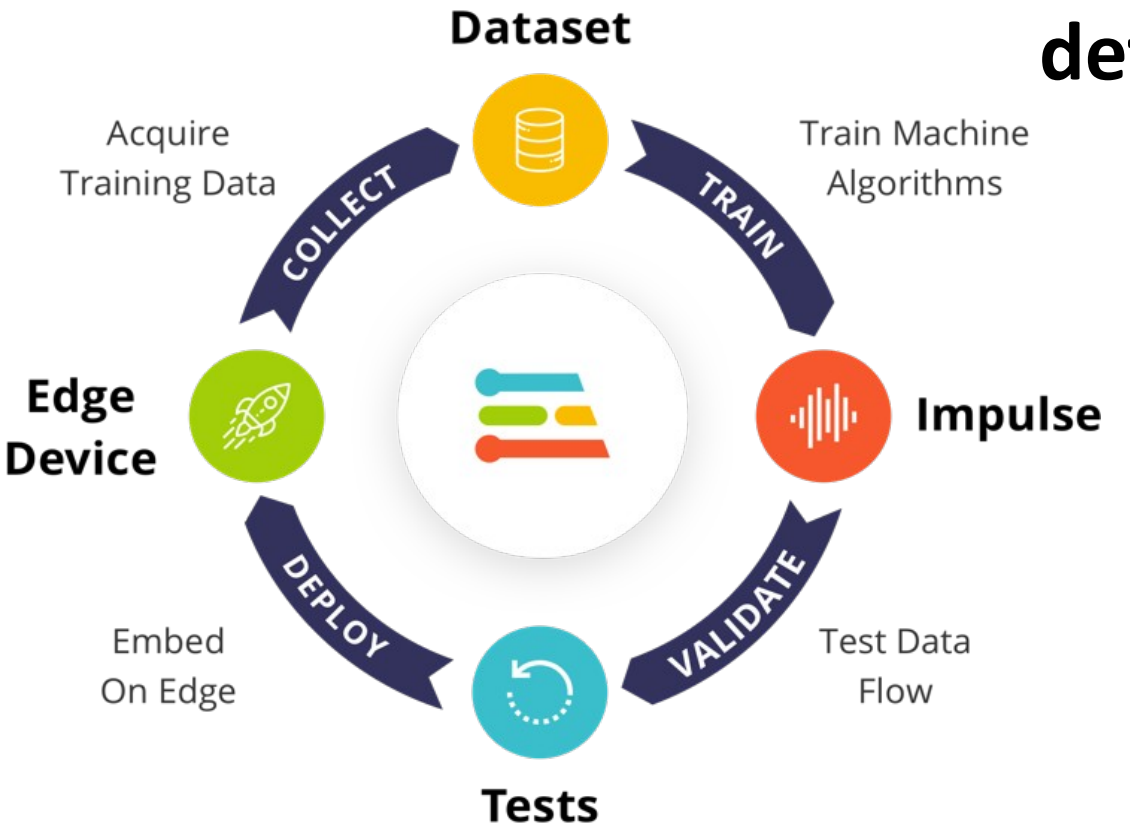
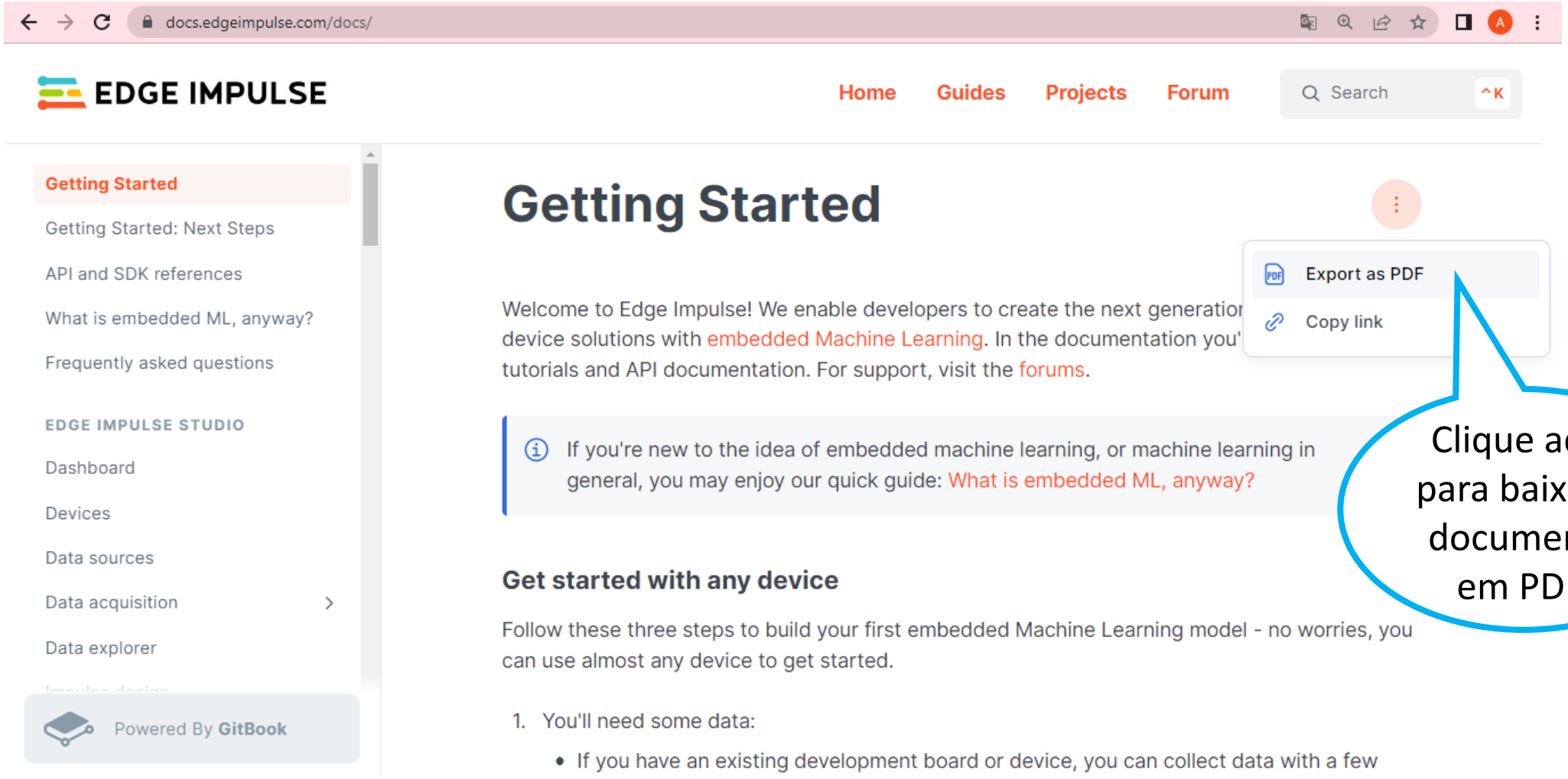


Através desse link você abrirá um documento que contém todos os detalhes da plataforma Edge Impulse.

Link:
https://docs.edgeimpulse.com/docs/

Edge Impulse



Clique aqui para baixar o documento em PDF.

Link: https://docs.edgeimpulse.com/docs/

Referências

- Harvard School of Engineering and Applied Sciences - CS249r: Tiny Machine Learning
- Professional Certificate in Tiny Machine Learning (TinyML) – edX/Harvard
- Introduction to Embedded Machine Learning - Coursera/Edge Impulse
- Computer Vision with Embedded Machine Learning - Coursera/Edge Impulse
- Fundamentals textbook: “Deep Learning with Python” by François Chollet
- Applications & Deploy textbook: “TinyML” by Pete Warden, Daniel Situnayake
- Deploy textbook “TinyML Cookbook” by Gian Marco Iodice

Quero agradecer a Shawn Hymel e Edge Impulse, Pete Warden e Laurence Moroney do Google, Professor Vijay Janapa Reddi e Brian Plancher de Harvard, ao professor Marcelo Rovai da UNIFEI e o restante da equipe do TinyMLedu por preparar o material excelente sobre TinyML que é a base deste curso do IFSP – Campus Cubatão.

O curso IFSP01_TinyML é parte do **TinyML4D**, uma iniciativa para tornar o aprendizado sobre TinyML disponível para todos em todo o mundo.

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