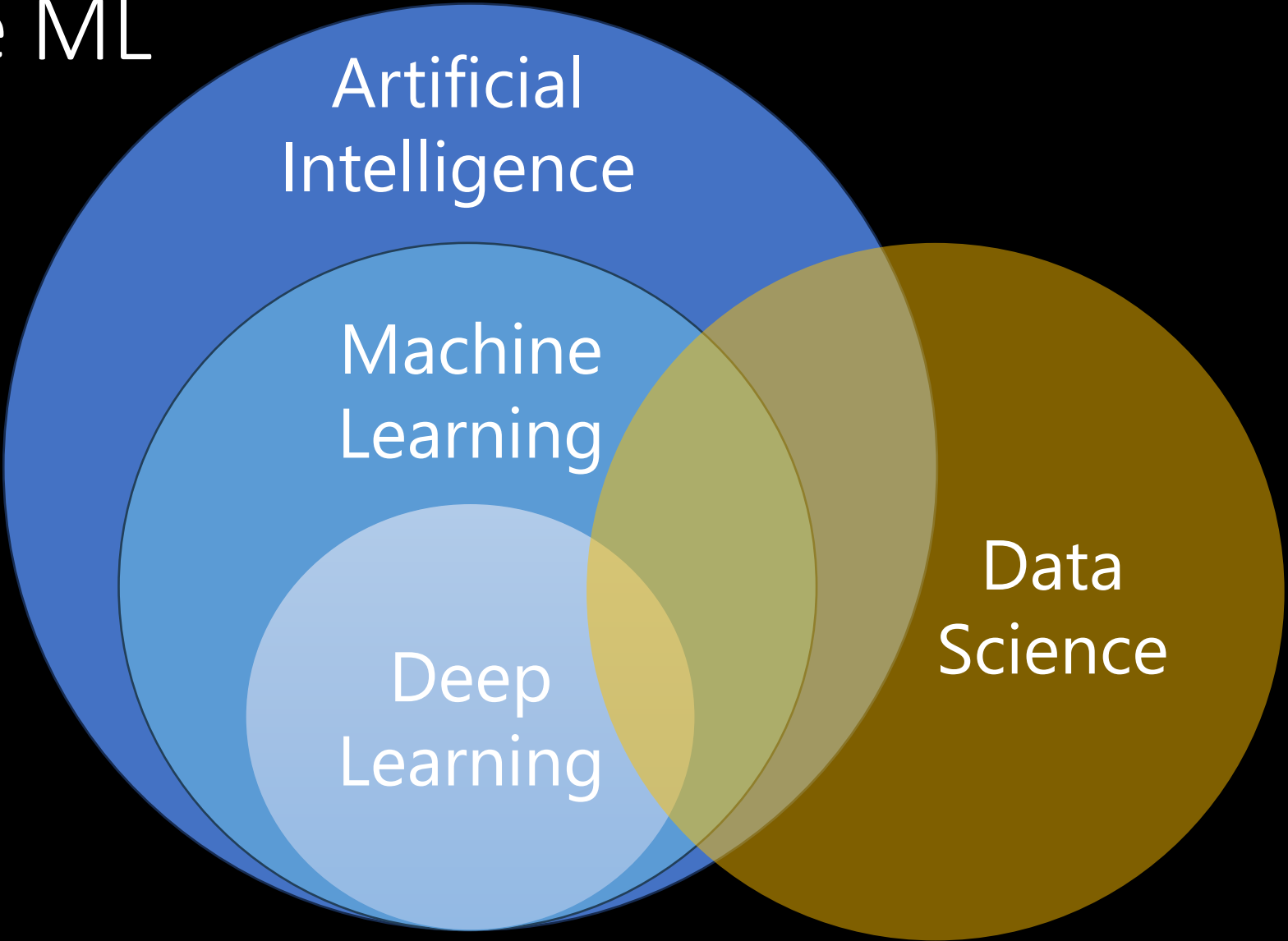


ML.NET

Hannes Preishuber



Define ML



Wonderful Tool



What is it good for

Predict crime

Good and bad citizens

Track you

Fake you

LLM bias, hallucinations,
manipulate

Skynet II

Always be kind!



Service or local machine



Cloud provider business

AWS, Azure, OpenAI ...

API calls for \$

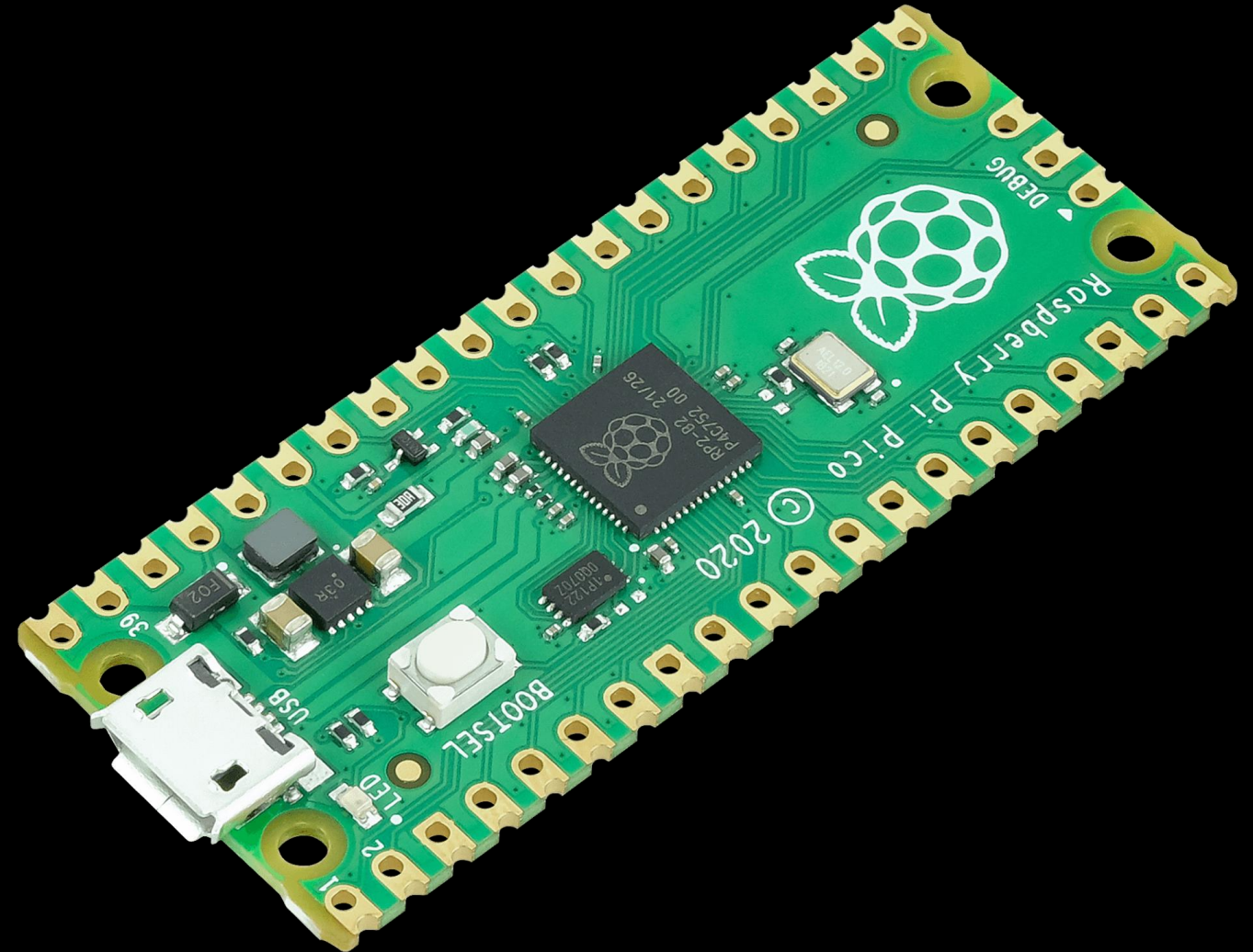
Local on your machine

Superhardware CUDA

Windows ML GPU

CPU

Tiny as Raspberry Zero



Can I...?





Immo Landwerth @terrajobst · 27. Juni 2018



Here is the **ML .NET** folks playing volleyball. Looking at the demonstrated skills, Terminator style AI is still in a galaxy far far away 🤓🕶️👿



Microsoft .NET & AI & LLM



ML.NET & Windows.ML/Direct.ML

Semantic Kernel

AutoGen

Microsoft.ML.OnnxRuntimeGenAI

Extensions.AI

Application

Your .NET App leveraging AI

Microsoft.Extensions.AI

LLM Clients and AI Services

Semantic Kernel

OpenAI

LLM Community packages

Azure AI Inference

Ollama

GitHub Models

Microsoft.Extensions.AI.Abstractions

Core Types
IChatClient
ChatMessage
Embeddings

Content Types: TextContent, ImageContent, AudioContent etc.

Support for
DI, Pipelines and
Middleware
(Caching, Tool Calling,
Telemetry)

Provides an
IChatClient that
connects to LLM
providers

Large Language Model?! Phi-3



Chat

Embeddings

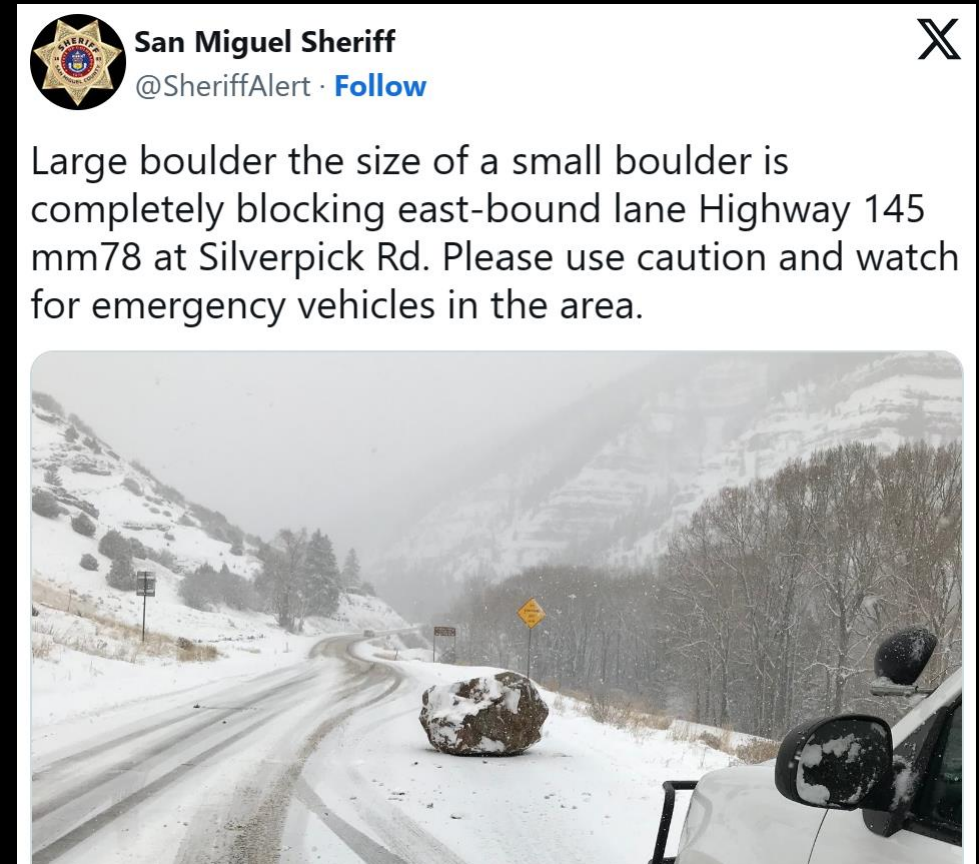
Functions

Agents

Fine Tuning

Phi-3 a tiny LLM

Vision



What is ML.NET (3 / 4)

Runs local (base for Azure services)

Windows, Linux, IOS

Non solvable problems

AI runs in my .net App

Usage like Entity Framework

Modell

ML.NET, ONNX, Tensorflow, Yolo, Phi-3...

MLContext

Dataset

Features +Labels

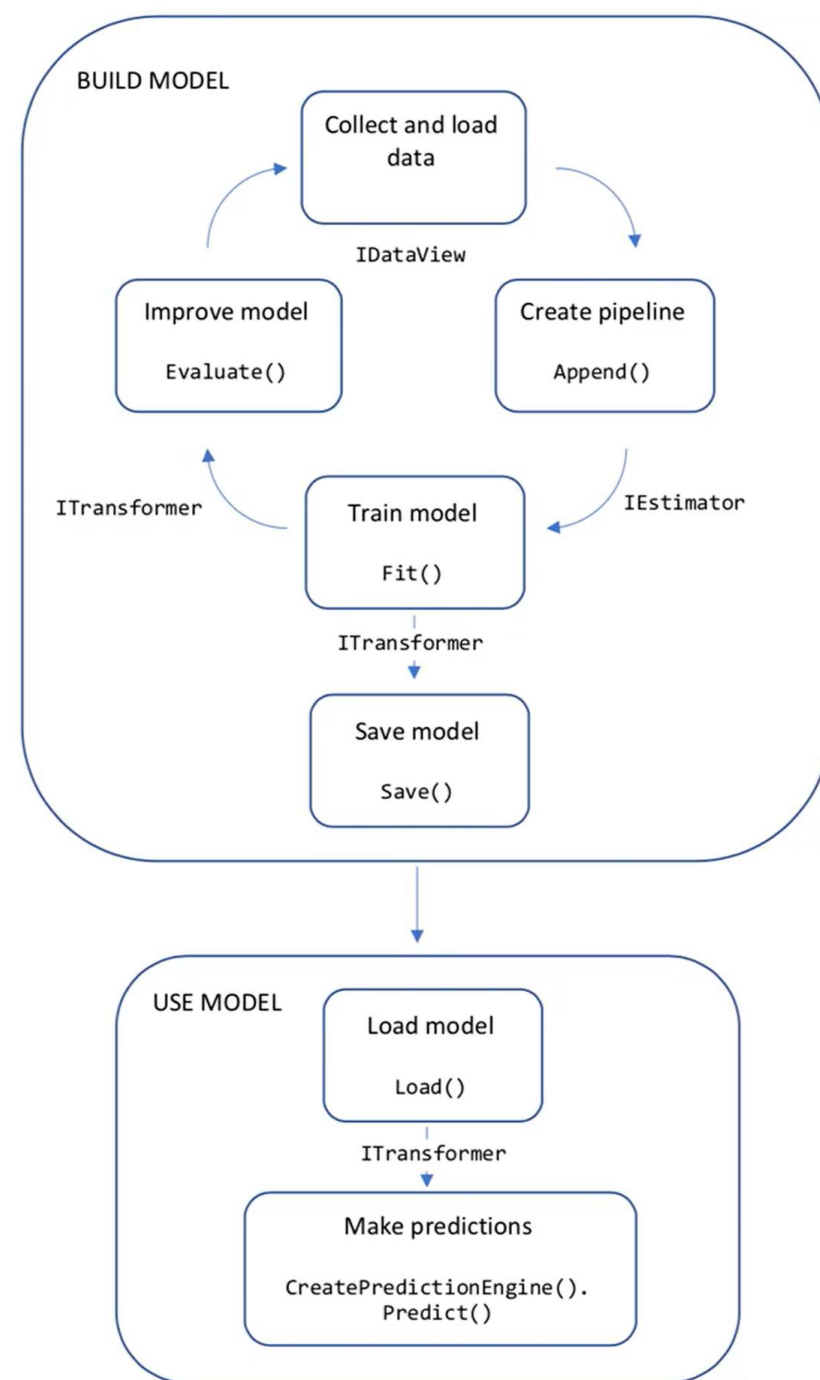
Pipeline

Transform

Training

Evaluate

Predict



```
var ctx = new MLContext

IDataView trainingData = ctx.Data.LoadFromTextFile<ModelInput> dataPath
true

var pipeline = ctx.Transforms.Text.FeaturizeText("Features")
nameof SentimentIssue.Text.Append(ctx.BinaryClassification.Trainers
LbfgsLogisticRegression "Label" "Features")

ITransformer trainedModel = pipeline.Fit(trainingData)

var predictionEngine = ctx.Model.CreatePredictionEngine<ModelInput,
ModelOutput>(trainedModel)
var sampleStatement = new ModelInput { Text = "This is a horrible movie" }
var prediction = predictionEngine.Predict(sampleStatement)
```

Demos Sources



Visual Studio Model Builder

Training Vision Model with <https://www.customvision.ai>

Netron Model Viewer <https://netron.app/>

Bathroom Toilet from Stop Sign [Tutorial: Detect objects in images with Model Builder - ML.NET | Microsoft Learn](#)

Model Catalog from <https://huggingface.co>

Object Detection with Yolo from <https://learn.microsoft.com/en-us/dotnet/machine-learning/tutorials/object-detection-onnx>

LLM Phi-3 and 3.5 Labs <https://github.com/microsoft/Phi-3CookBook>