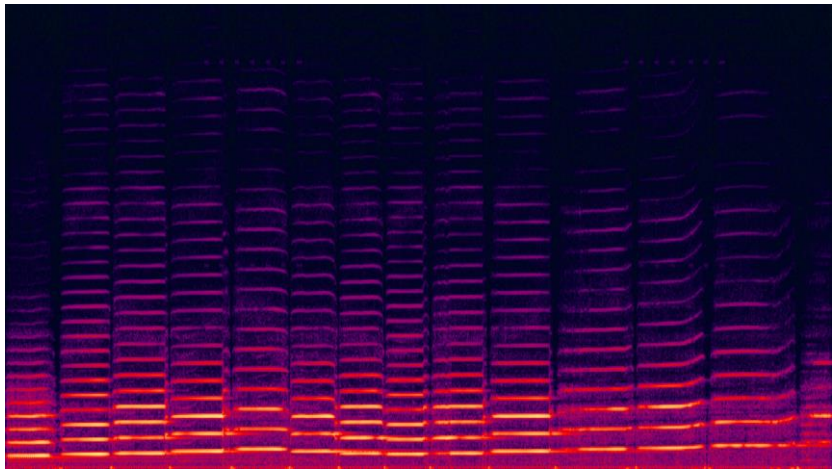
Sound Classification using ML.Net



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.net | bangalore meetup

Learn. Share. Network.

Introduction

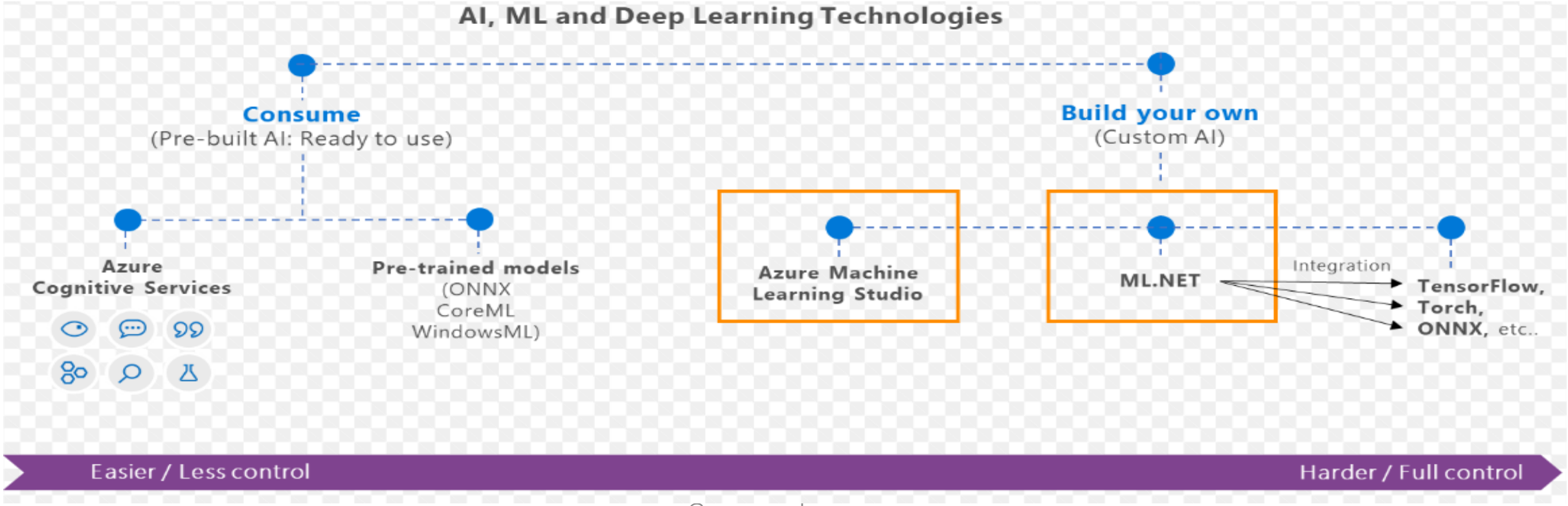
- Technical Architect @ Harman, A Samsung Company
- Area of Expertise: Cloud, Distributed computing
- Area of Interest: AI/ML and IoT
- Location: Bangalore, India
- Member: .Net Foundation

Agenda

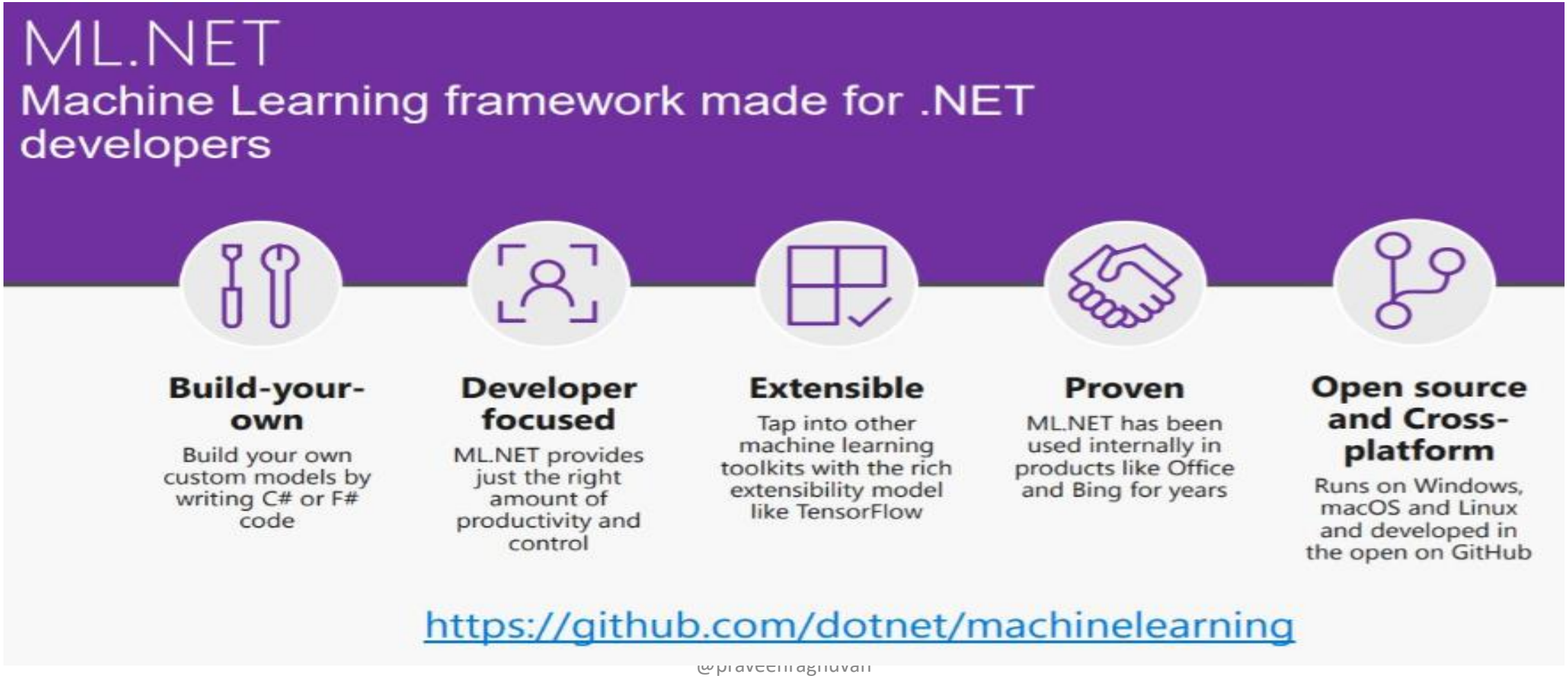
- What is ML.Net
- Basics of Sound
- Sound Classification
- Exploratory Data Analysis
- Framework and Tools
- Classification using ML.Net
- Demo

What is ML.Net ?

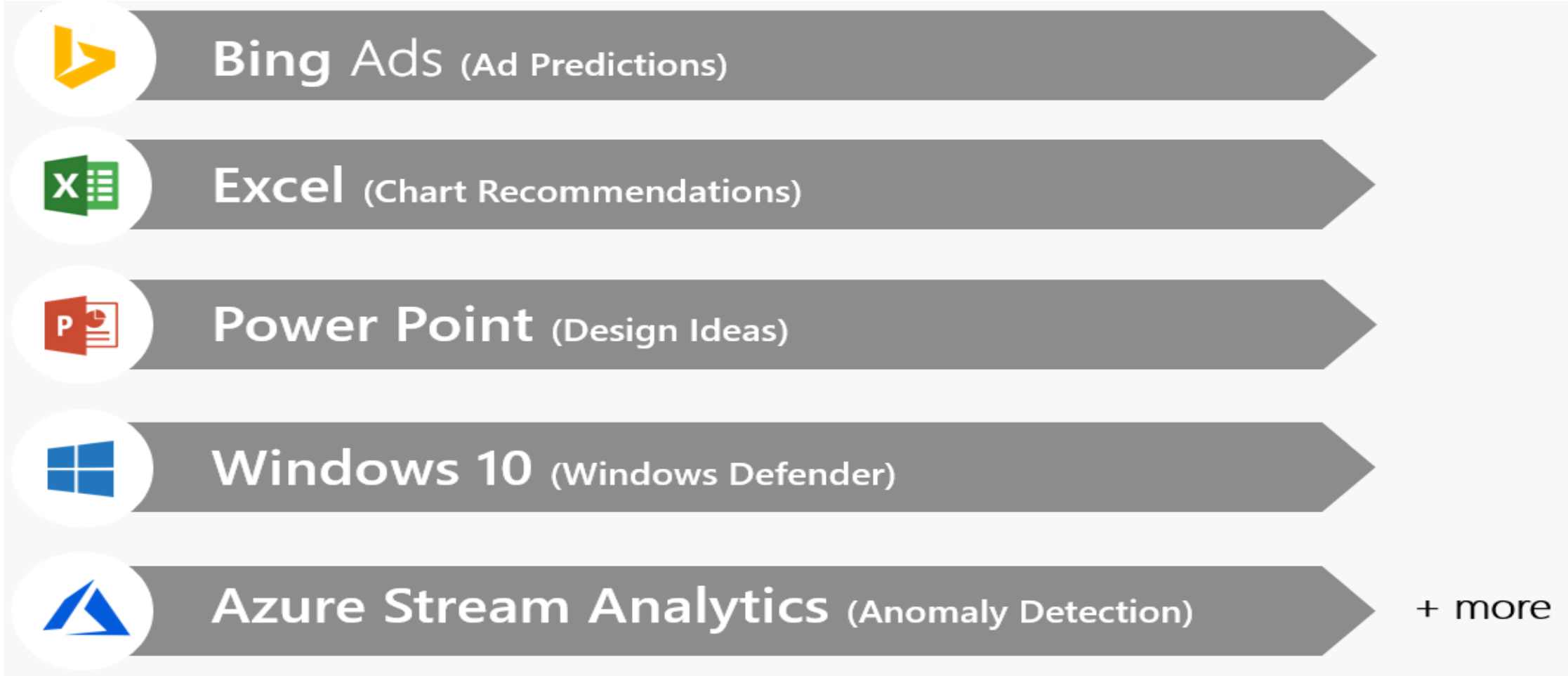
- ML Framework from Microsoft for developing custom AI/ML applications.
- Originated in 2002 as part of Microsoft Research Project



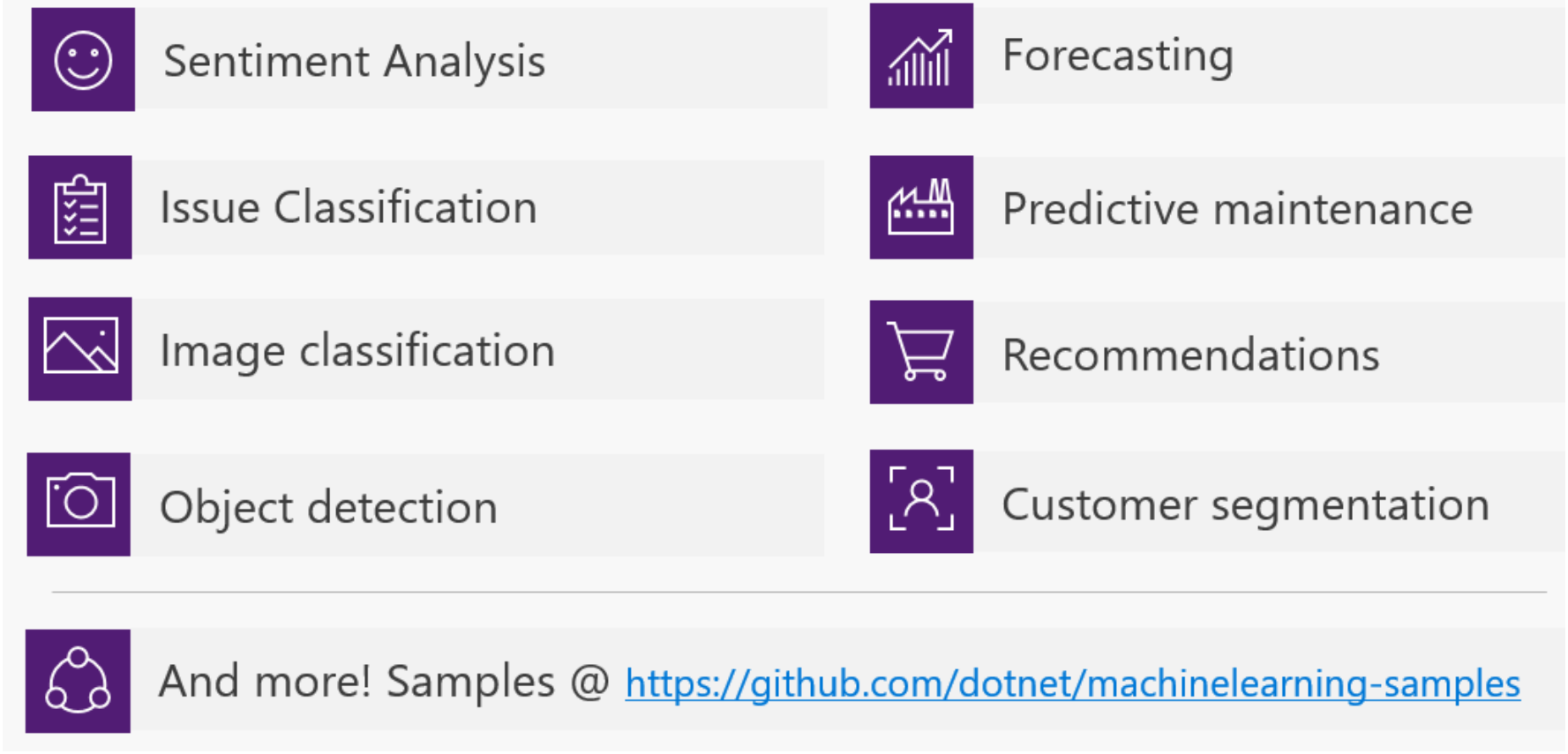
What is ML.Net ?



ML.Net-Proven at scale, Enterprise Ready



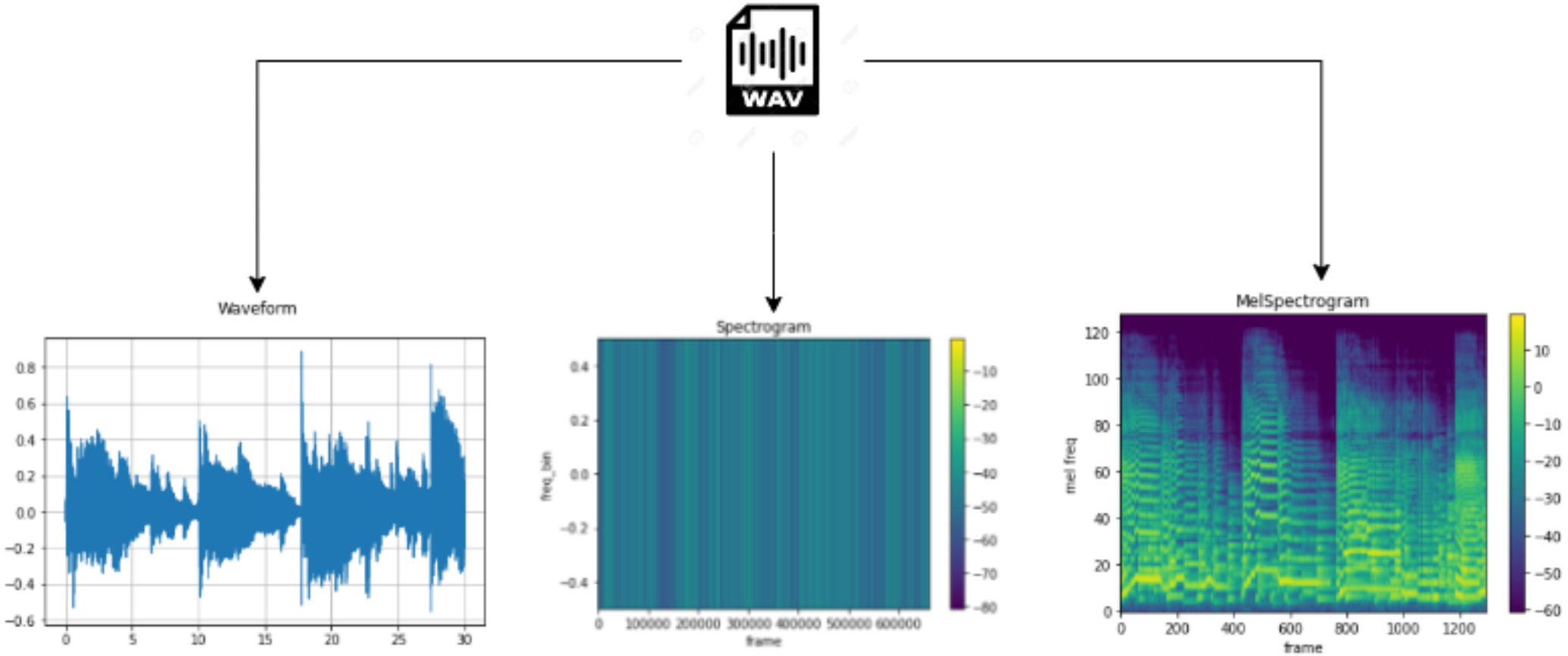
ML.Net-Possibilities



Basics of Sound

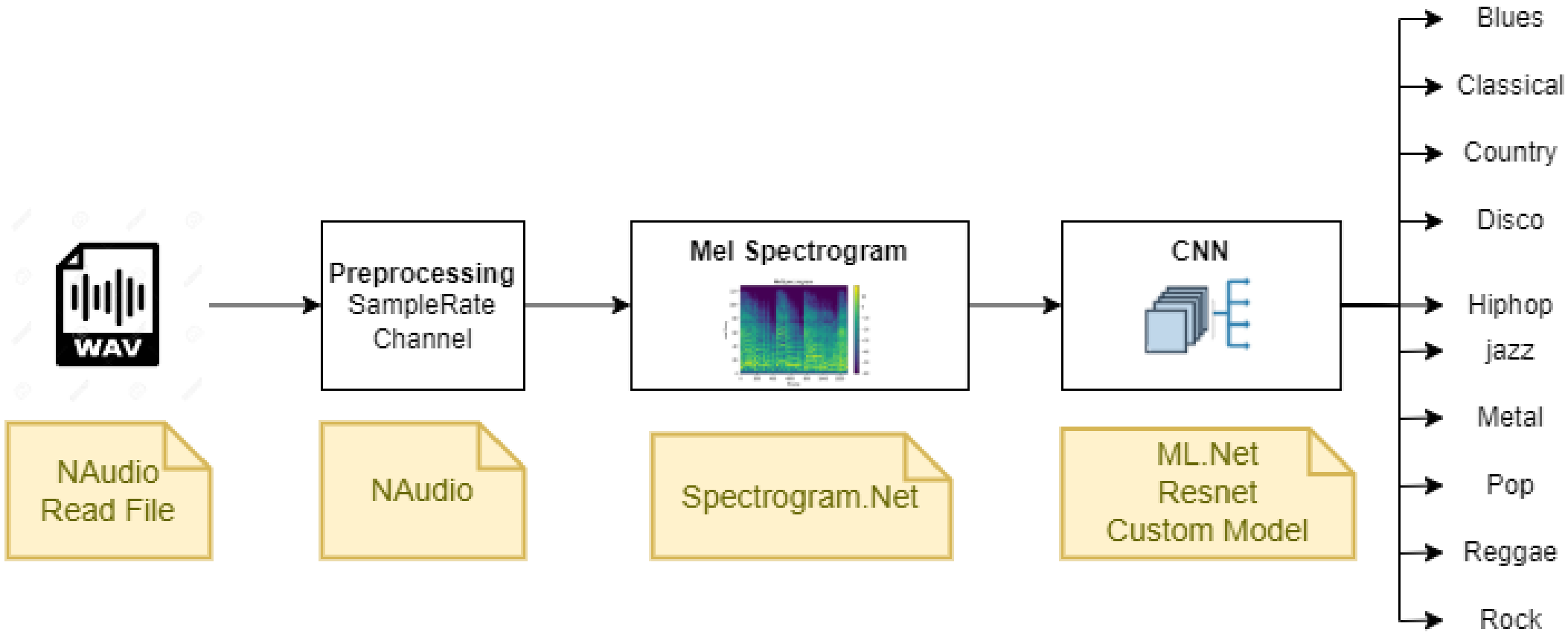
- **Sound** : A pressure wave created by a vibrating object.
- **Amplitude** : Measure of height of a wave or loudness
- **Frequency** : Total # of waves produced per second. Human(20Hz – 20KHz)
- **SampleRate** : How many times per second a sound is sampled. 44.1KHz, 96KHz
- **BitRate** : Amount of data transferred into audio. 8-bit, 16-bit, 24-bit.
- **Channels** : Represents spatial experience of sound. Mono/Stereo/Surround
- **FFT** : Fast Fourier Transform. A way to convert signal from time to frequency domain

Visual Representation

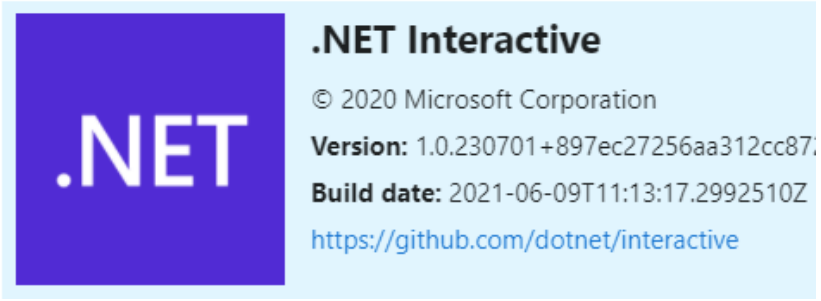


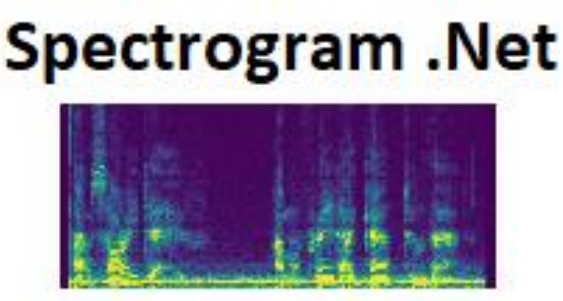
https://musiclab.chromeexperiments.com/spectrogram

Sound Classification



Framework and Tools





Demo

Resources

https://github.com/praveenraghuvanshi/tech-sessions/tree/master/14042022-Practical-ML-Net-Sound-Classification

Thank you

Q & A

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