



Serverless Deep Neural Network(DNN) with Azure Functions and ML.Net

Praveen Raghuvanshi
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Introduction

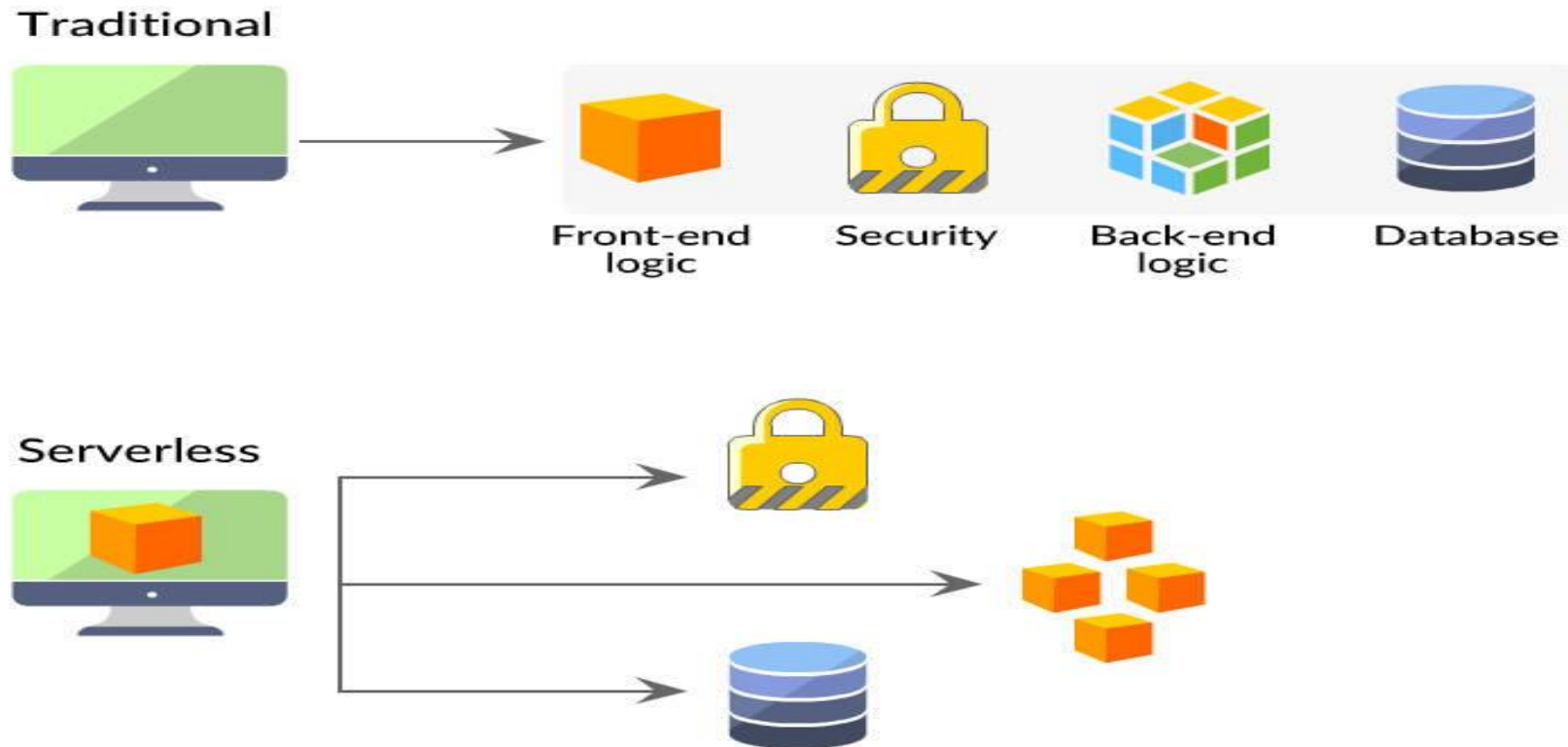
- Cloud Architect @ Harman, A Samsung Company
- Domain: Professional Audio, Video & Control
- Area of Expertise: Cloud, Distributed computing
- Area of Interest: AI/ML and IoT
- Location: Bangalore, India
- Member:



Agenda

- Serverless
- Azure Functions
- Deep Neural Networks(DNN)
- Image Classification
- ML.Net
- Demo

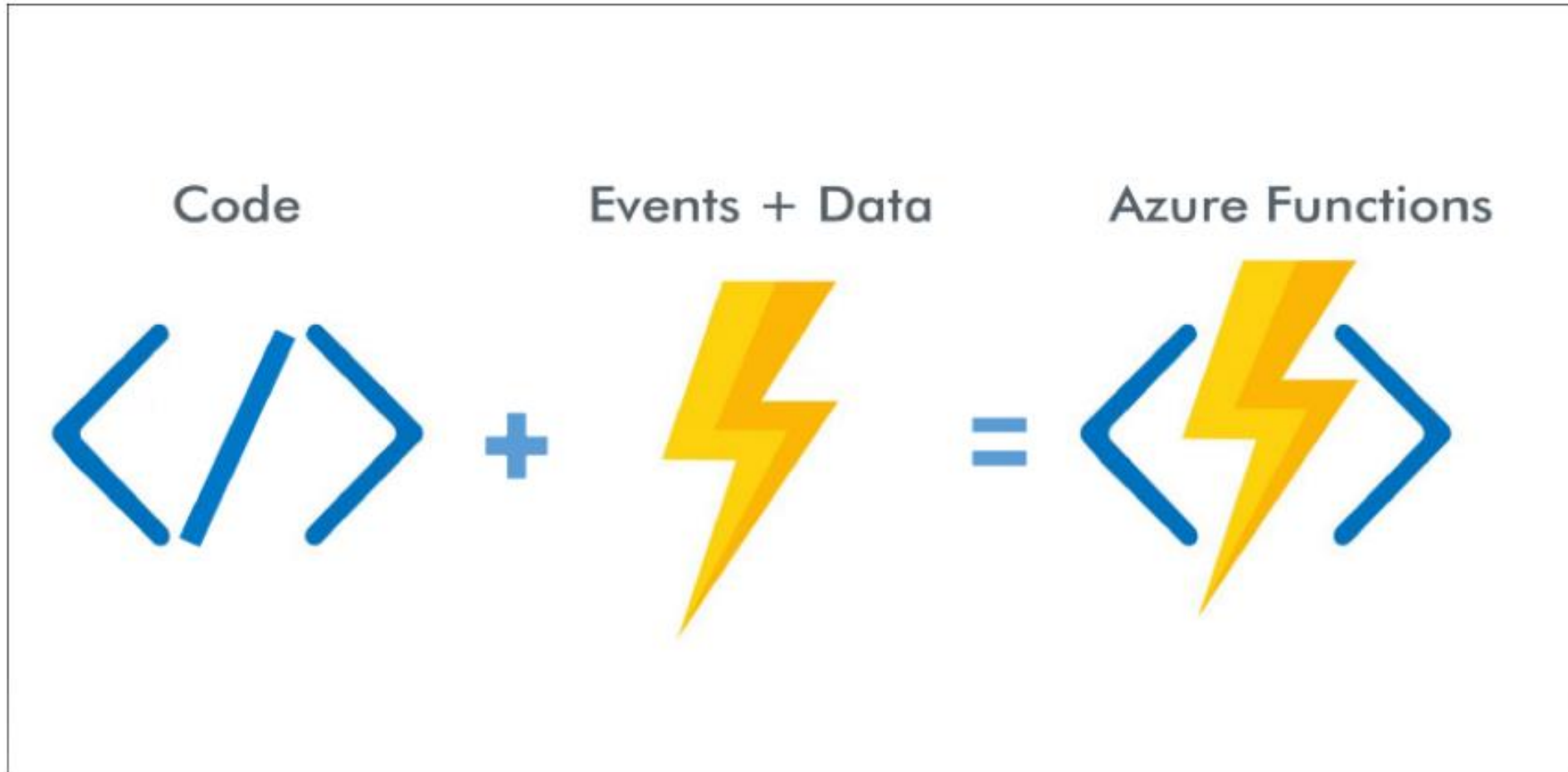
Serverless



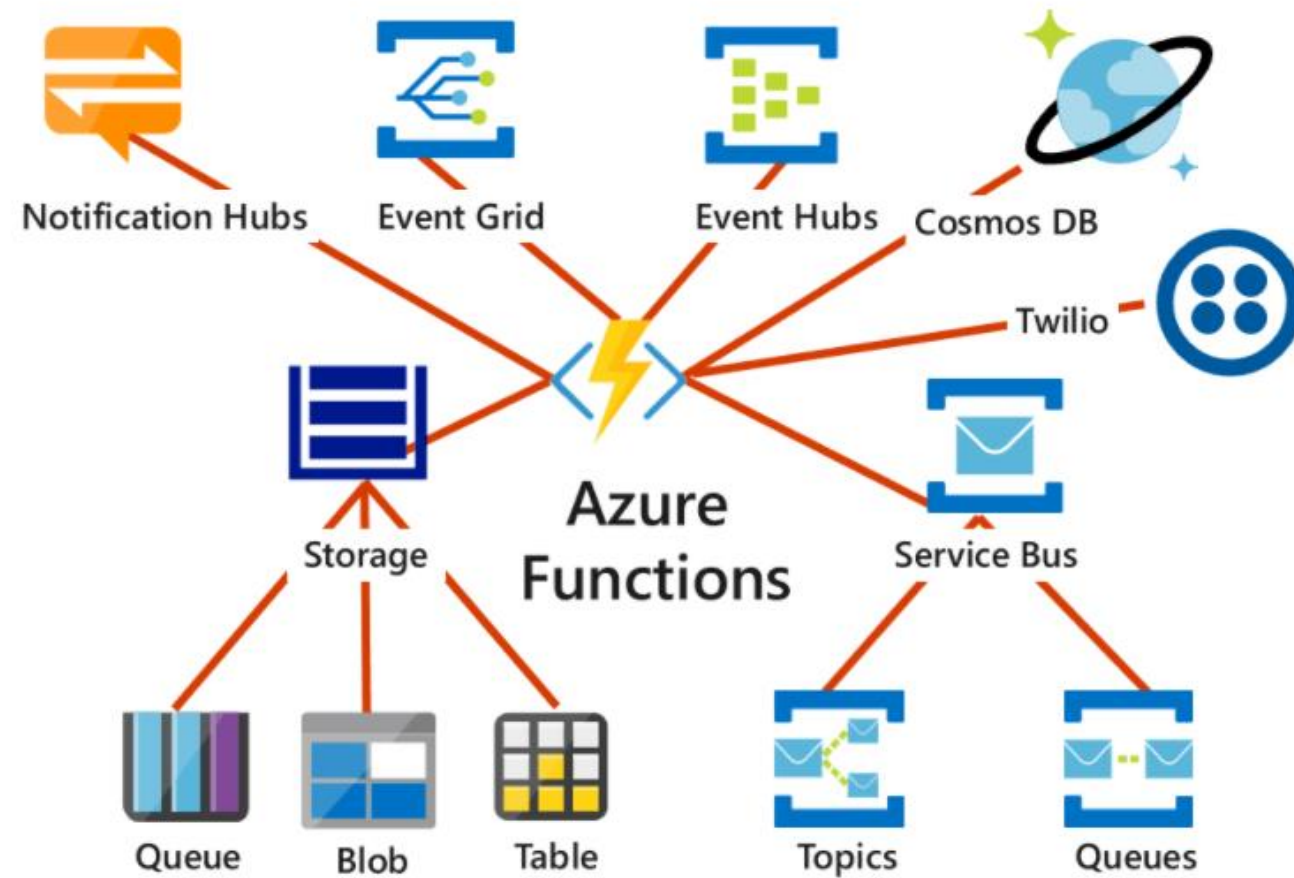
source: <https://danielhkim.net/2020/02/27/serverless-cloud-computing/>

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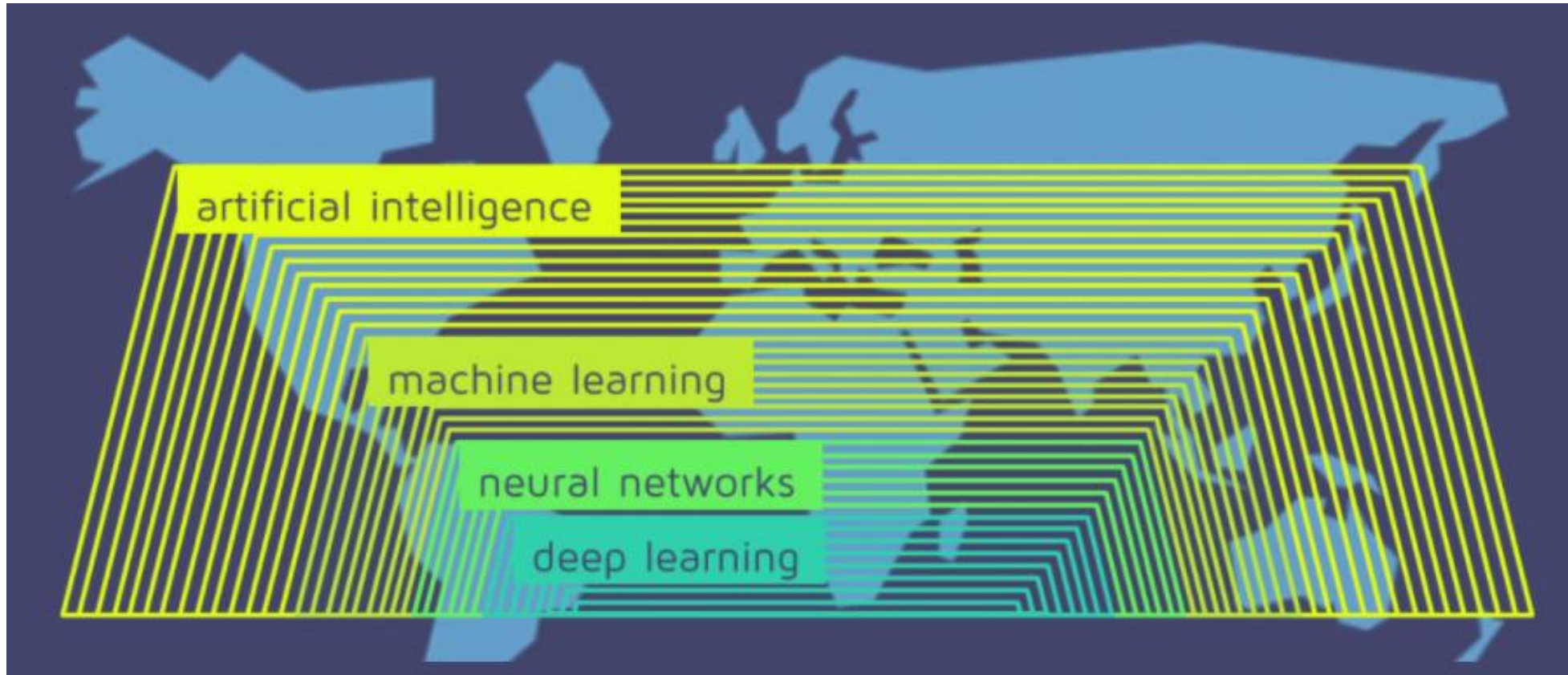
Azure Functions



Azure Functions

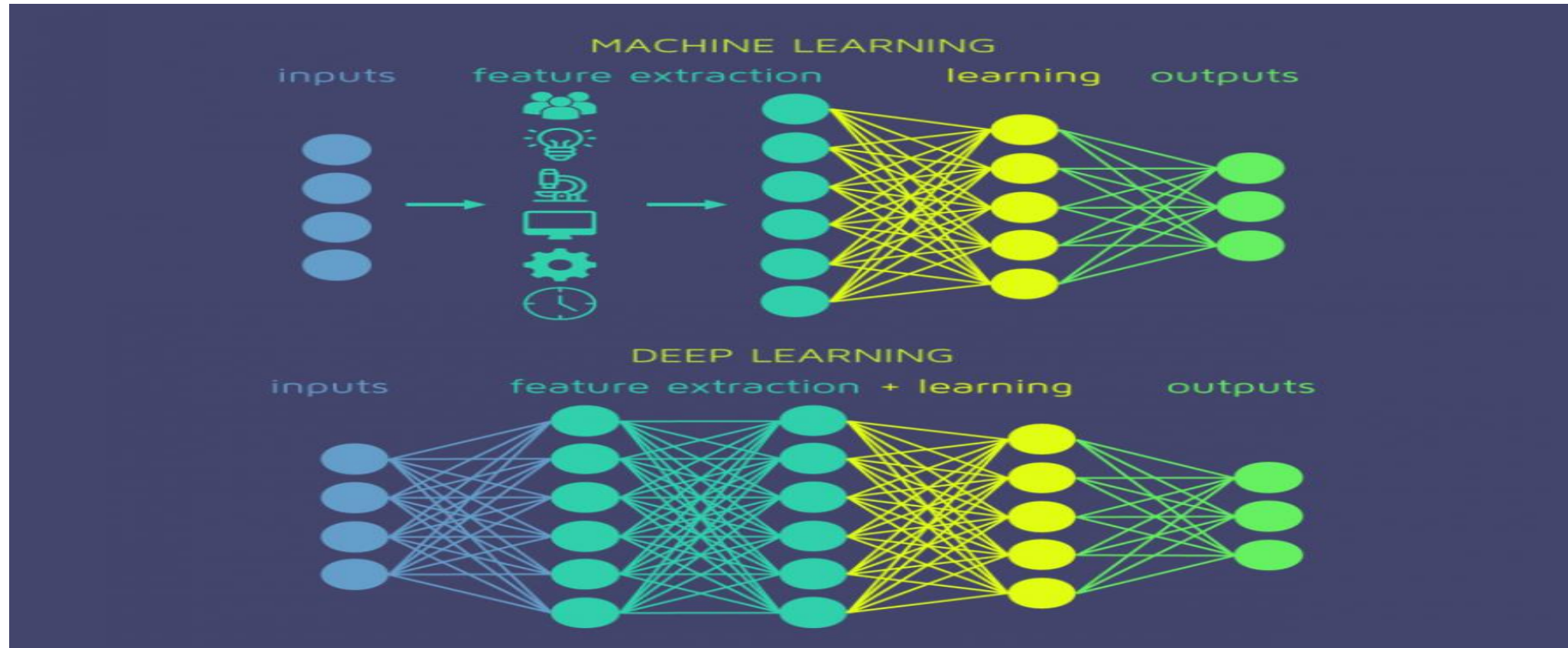


Deep Neural Network



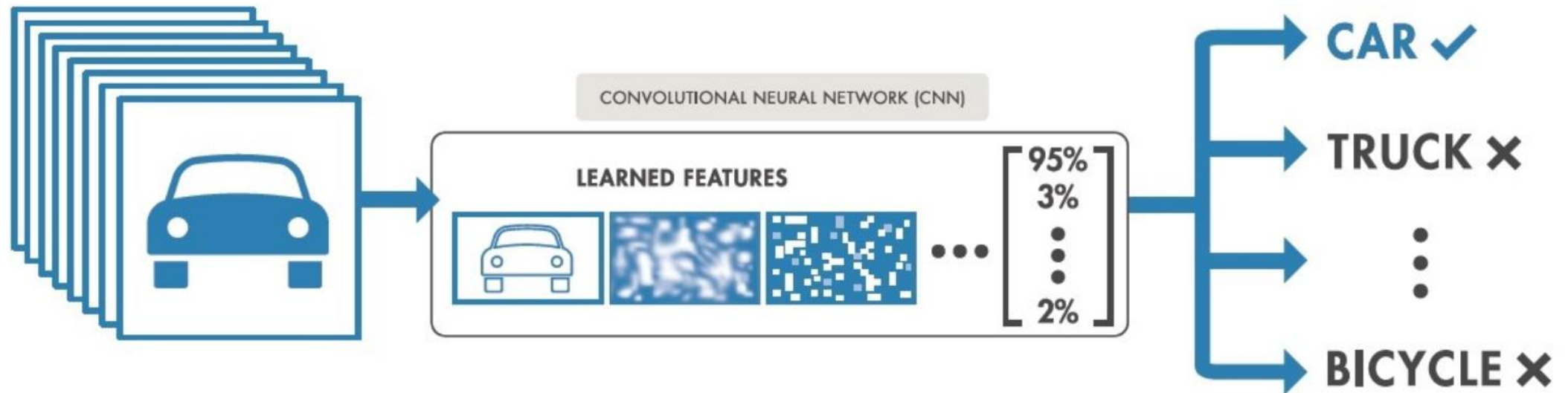
source: <https://quantdare.com/what-is-the-difference-between-deep-learning-and-machine-learning/>

Deep Neural Network



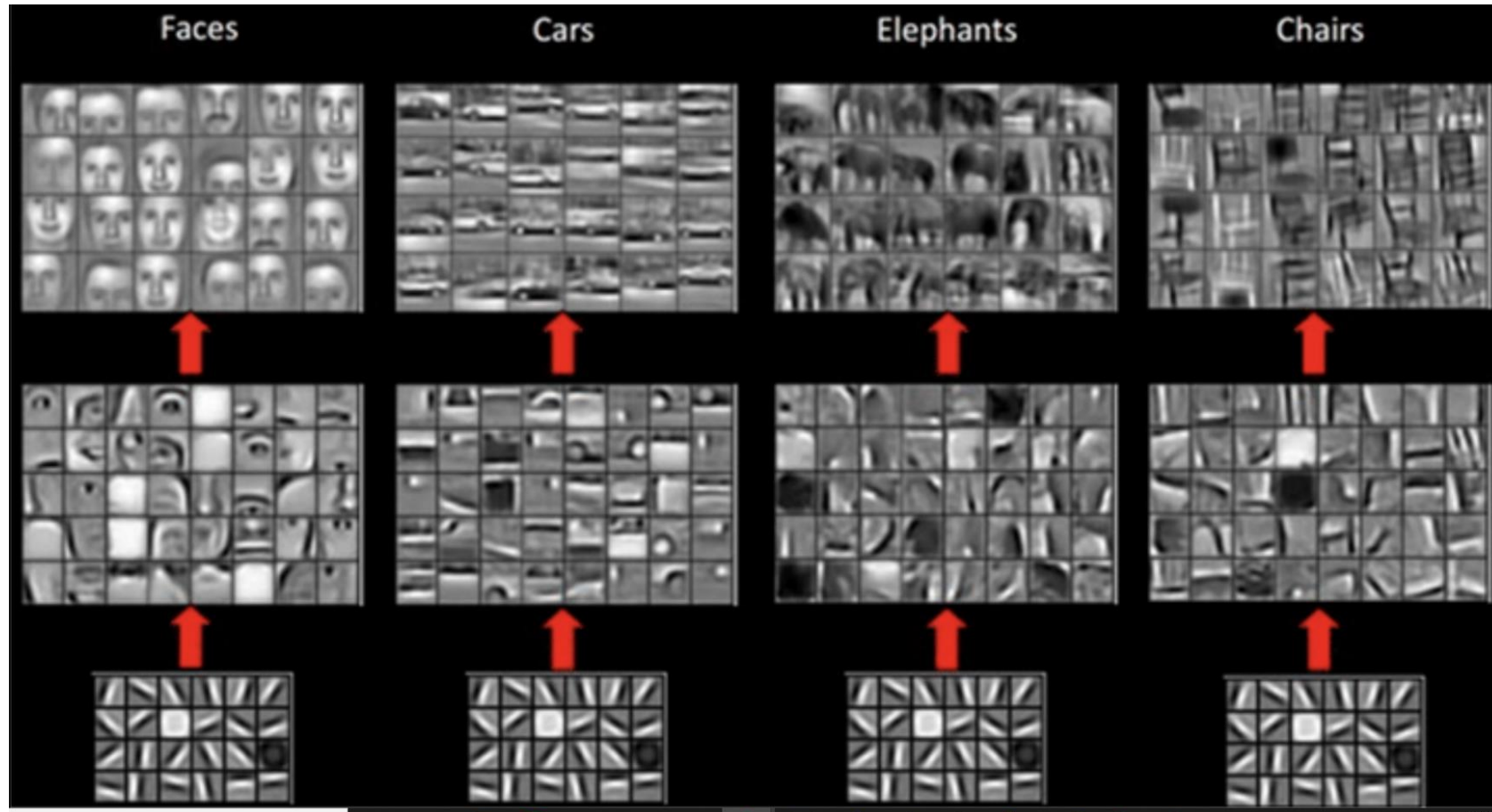
source: <https://quantdare.com/what-is-the-difference-between-deep-learning-and-machine-learning/>

Image Classification



Source : MathWorks (<https://goo.gl/zondfq>)

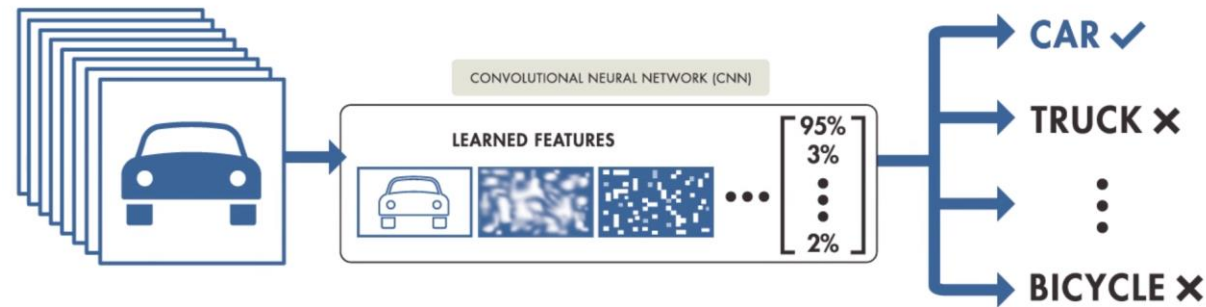
Image Classification



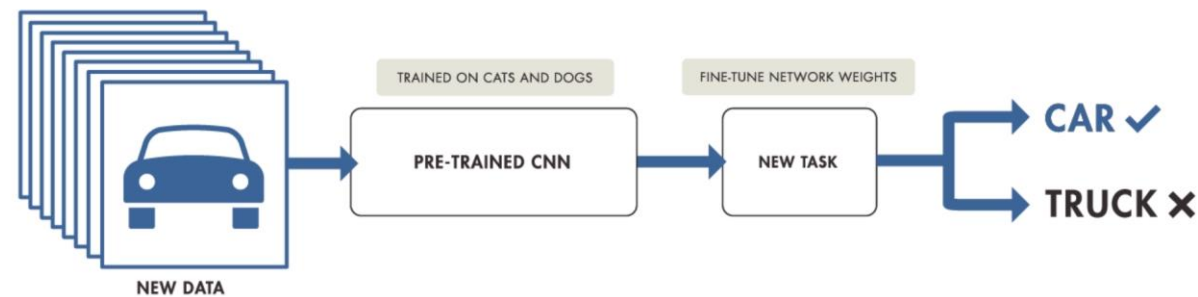
source: https://miro.medium.com/max/1910/1*fLGuAUT5imTIGaEa4zzaWA.png
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Transfer Learning – MobileNet V2

TRAINING FROM SCRATCH

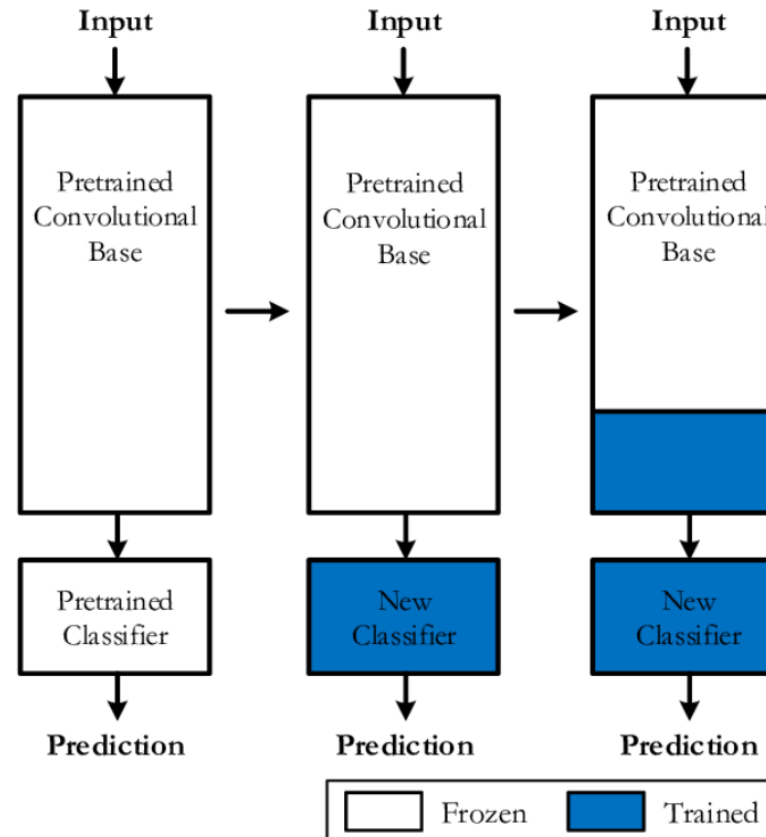


TRANSFER LEARNING



source: <https://i.pinimg.com/originals/0a/76/eb/0a76eb3c95c249cdff9449af08ac4efc.png>

Transfer Learning








source: https://www.researchgate.net/figure/TOP-LEVEL-DIAGRAM-OF-TRANSFER-LEARNING-FROM-A-PRE-TRAINED-CNN-MODEL_fig4_333882146

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ML.Net

ML.NET
Machine Learning framework made for .NET developers



Build-your-own
Build your own custom models by writing C# or F# code

Developer focused
ML.NET provides just the right amount of productivity and control

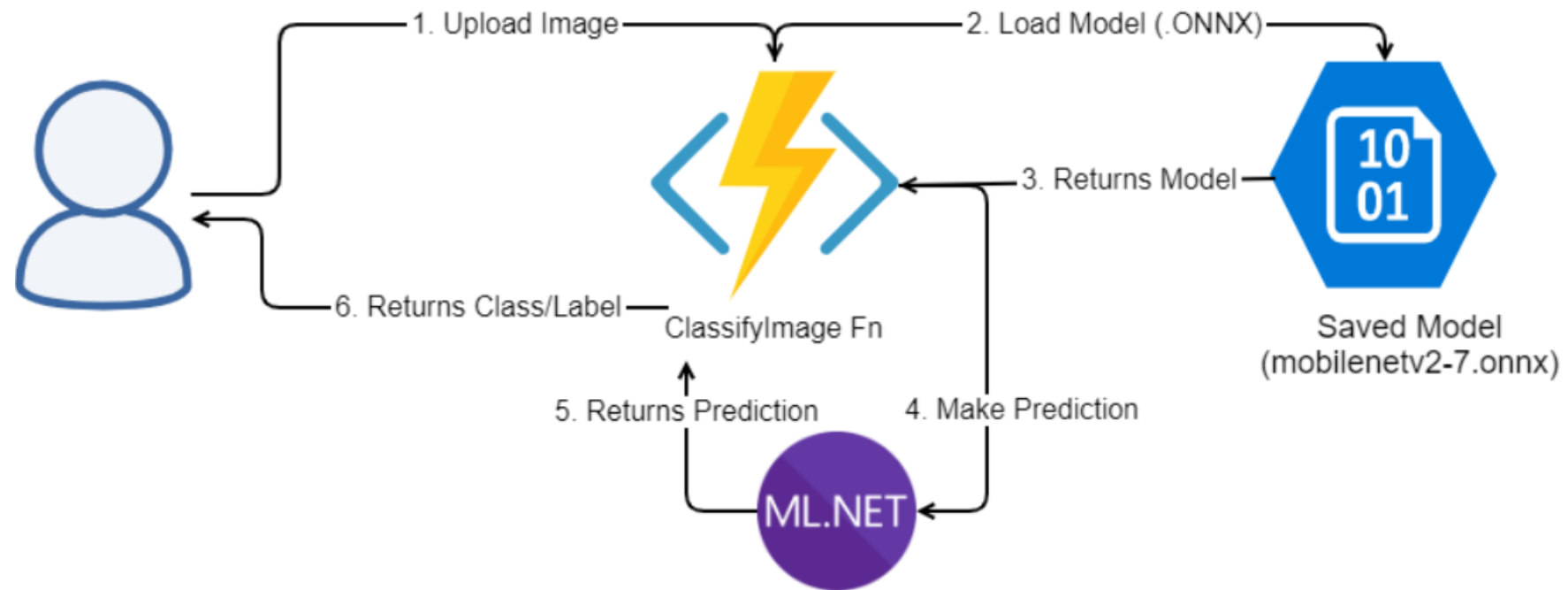
Extensible
Tap into other machine learning toolkits with the rich extensibility model like TensorFlow

Proven
ML.NET has been used internally in products like Office and Bing for years







Open source and Cross-platform
Runs on Windows, macOS and Linux and developed in the open on GitHub

<https://github.com/dotnet/machinelearning>

Cloud Architecture



Customer Success Stories – ML.Net

 Asgard Systems Asgard Systems uses demand forecasting in grocery stores to reduce food waste and gas house emissions. Learn more >	 Scancam Scancam uses ML.NET to detect vehicles at fuel station pumps and provides alerts for known offenders who previously drove off without paying for their fuel. Learn more >	 SigParser SigParser converts e-mail signatures to contacts and eliminates manual data entry; it uses ML.NET to predict if an e-mail sender is human or an automated system. Learn more >
 endjin endjin uses ML.NET with AutoML to improve the process of classifying articles for their Azure newsletter and to revolutionize simple, everyday tasks. Learn more >	 Microsoft Real Estate & Security Microsoft Real Estate & Security uses ML.NET to detect and classify HVAC system faults on Microsoft's campus and convert them to work orders. Learn more >	 Power BI Power BI uses ML.NET to help users identify key influencers and customer segments so that they can understand the factors that drive their business metrics. Learn more >

<https://dotnet.microsoft.com/apps/machinelearning-ai/ml-dotnet/customers>

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Demo

Resources

Github: <https://github.com/praveenraghuvanshi/tech-sessions/tree/master/27102021-AI-Dev-World-2021>

References

- <https://docs.microsoft.com/en-us/azure/azure-functions/functions-develop-vs>
- <https://blog.rasmustc.com/multipart-data-with-azure-functions-httptriggers/>
- <https://docs.microsoft.com/en-us/dotnet/machine-learning/tutorials/image-classification>
- <https://docs.microsoft.com/en-us/samples/dotnet/machinelearning-samples/mlnet-image-classification-transfer-learning/>
- <https://docs.microsoft.com/en-us/dotnet/machine-learning/tutorials/object-detection-onnx>



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<https://github.com/praveenraghuvanshi>



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https://t.me/joinchat/lifUJQ_PuYT757Turx-nLg

Thank you

Q & A