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Serverless Deep Neural Network with Azure Functions and ML.Net

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Introduction

- Cloud Architect @ Harman, A Samsung Company
- Domain: Professional Audio, Video and Control
- Area of expertise: Cloud, Distributed Computing
- Area of Interest: AI/ML and IoT
- Location: Bangalore, India
- Azure Certified

.NET foundation

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Agenda

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

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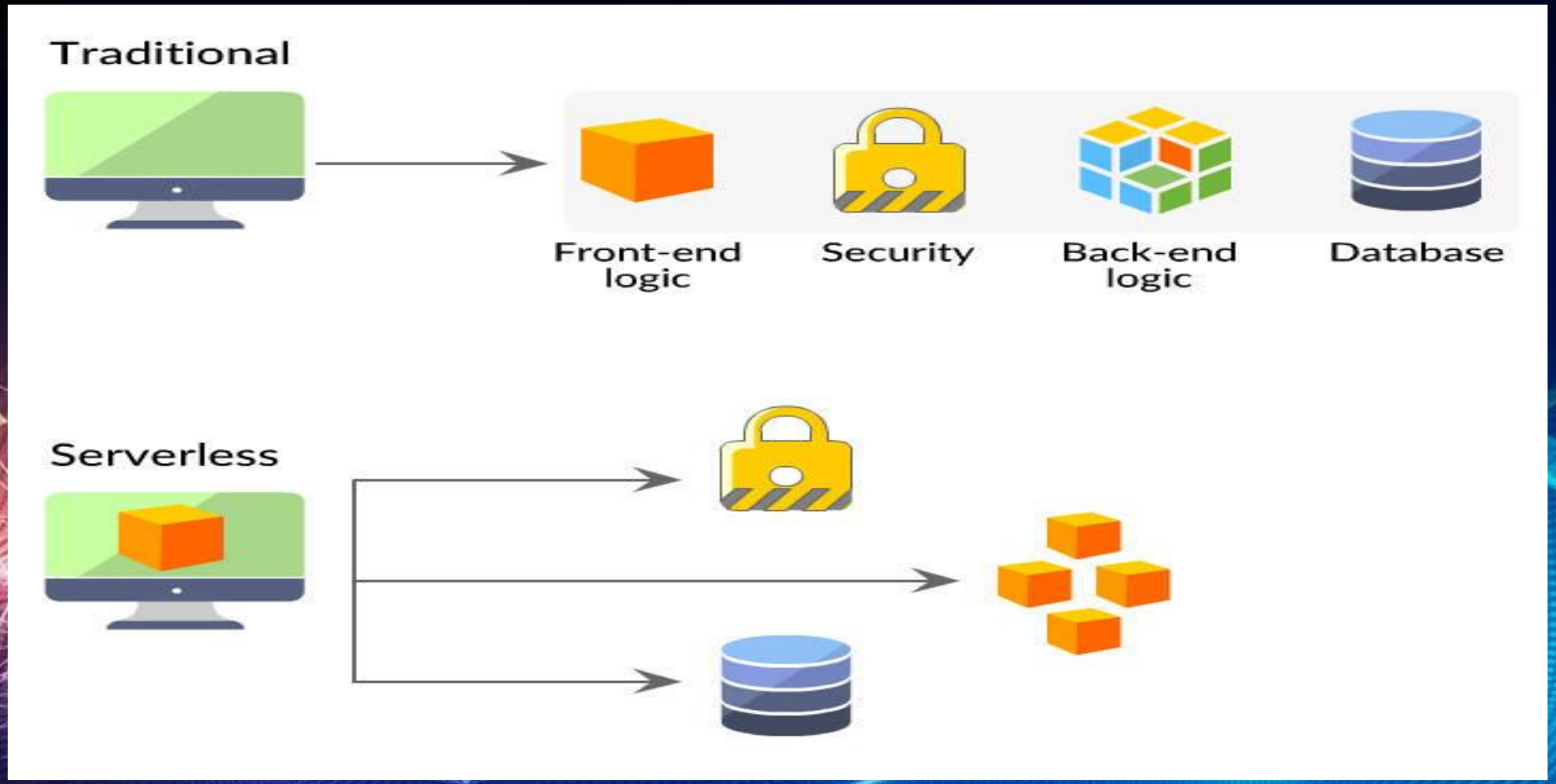
Serverless



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

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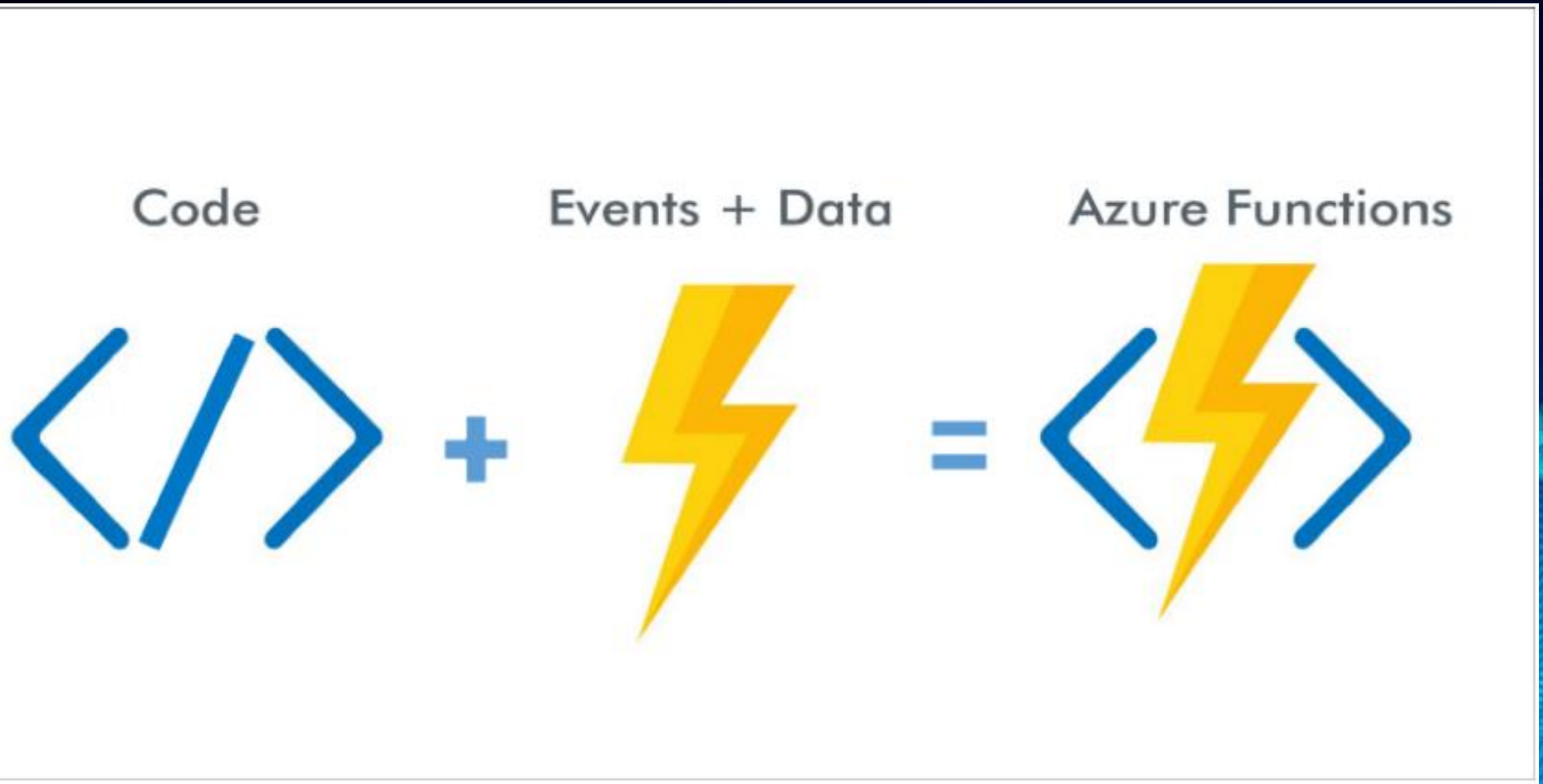
Azure Functions



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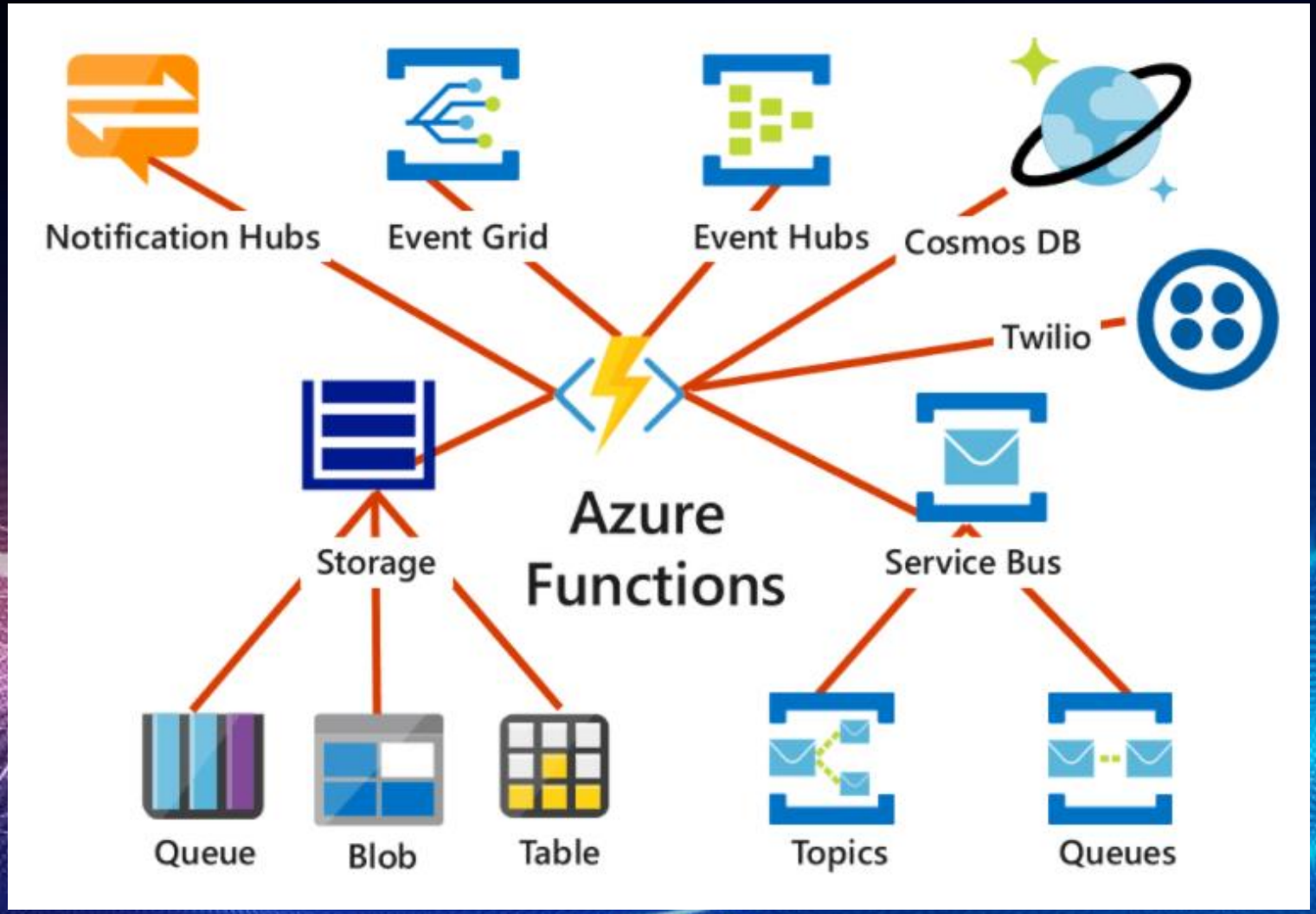
Azure Functions



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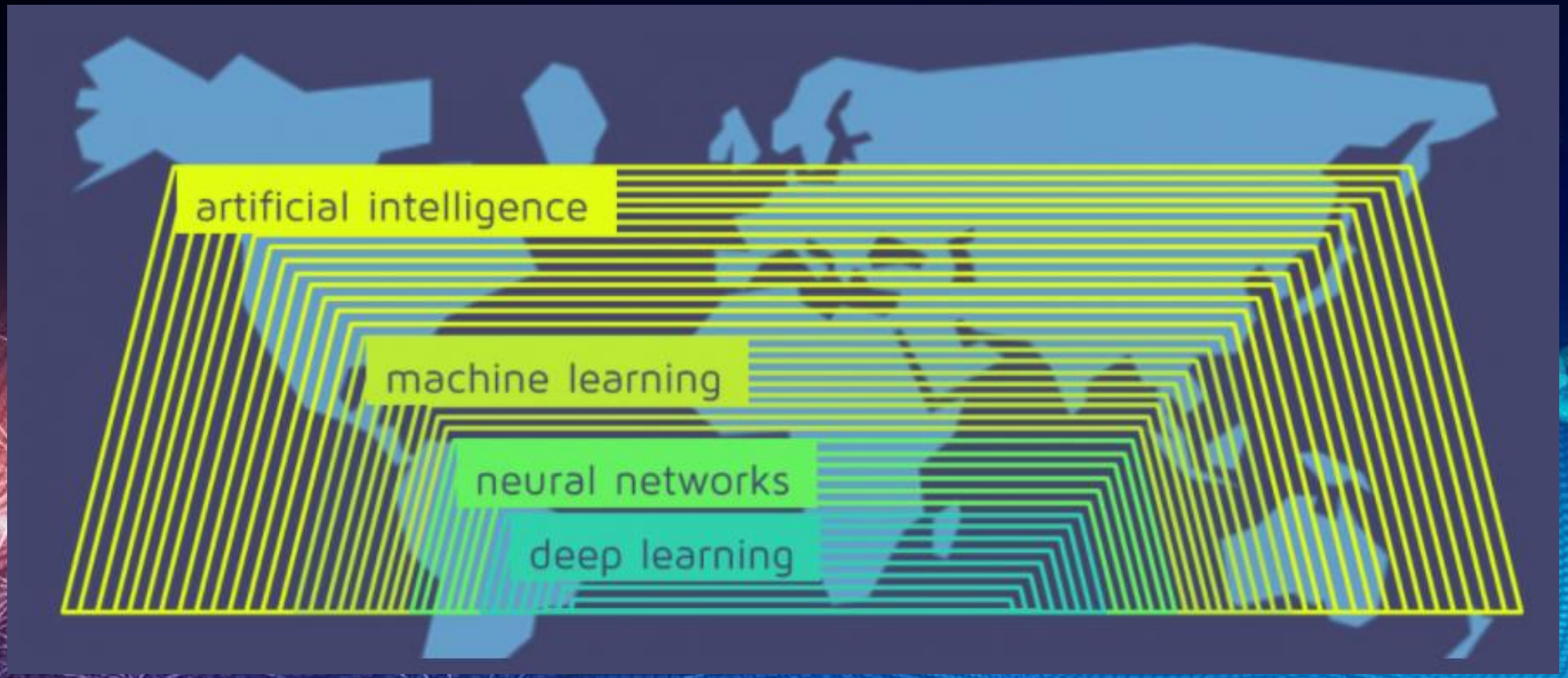
Deep Neural Network



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

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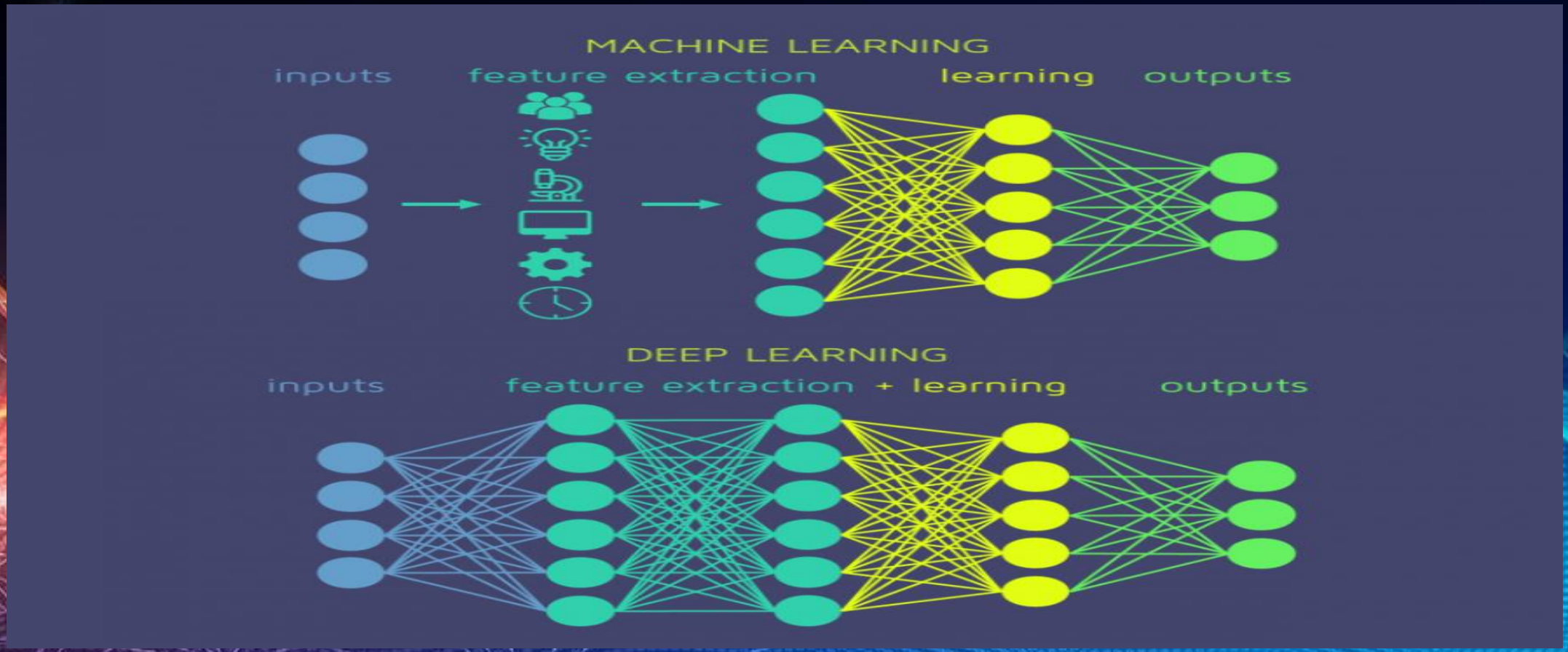
Deep Neural Network



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

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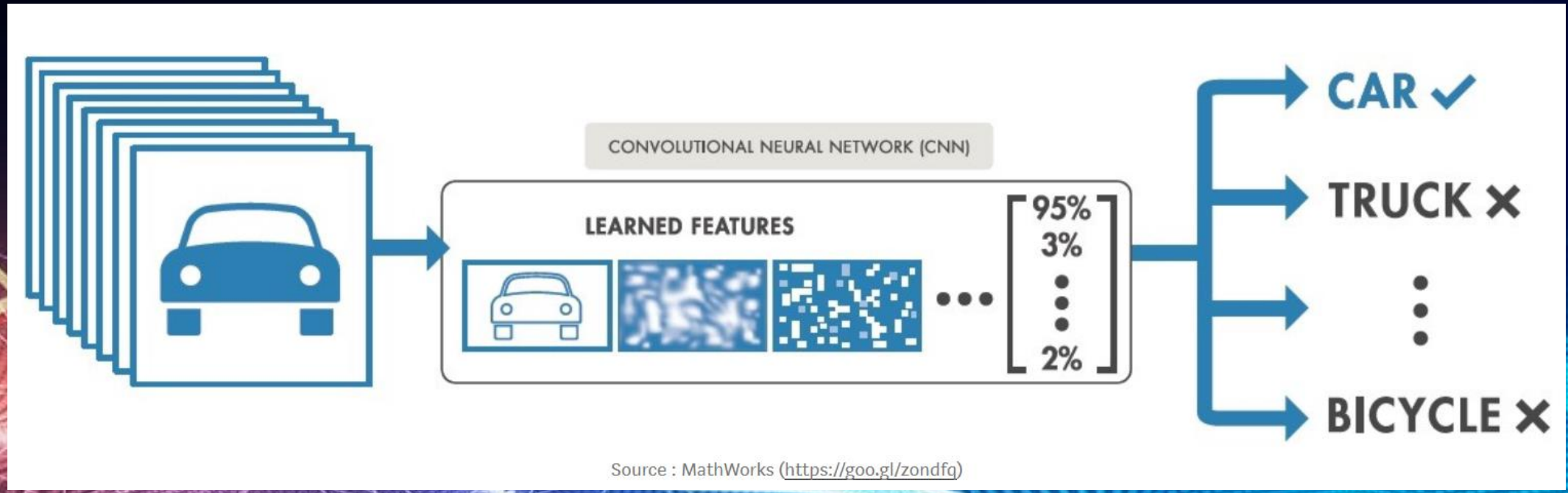
Image Classification



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

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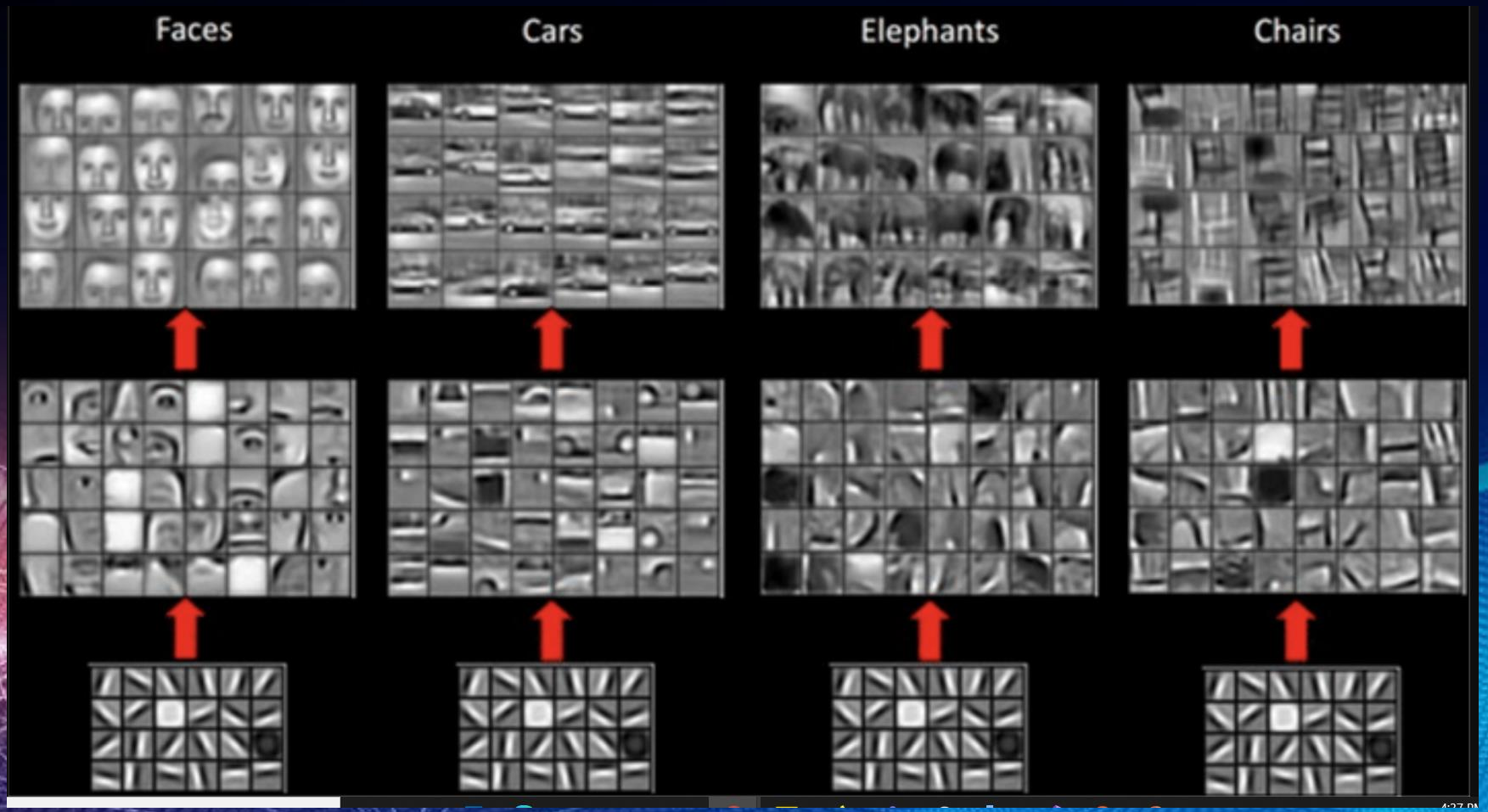
Image Classification



source: https://miro.medium.com/max/1910/1*fLGuAUT5imTIGAeA4zzaWA.png

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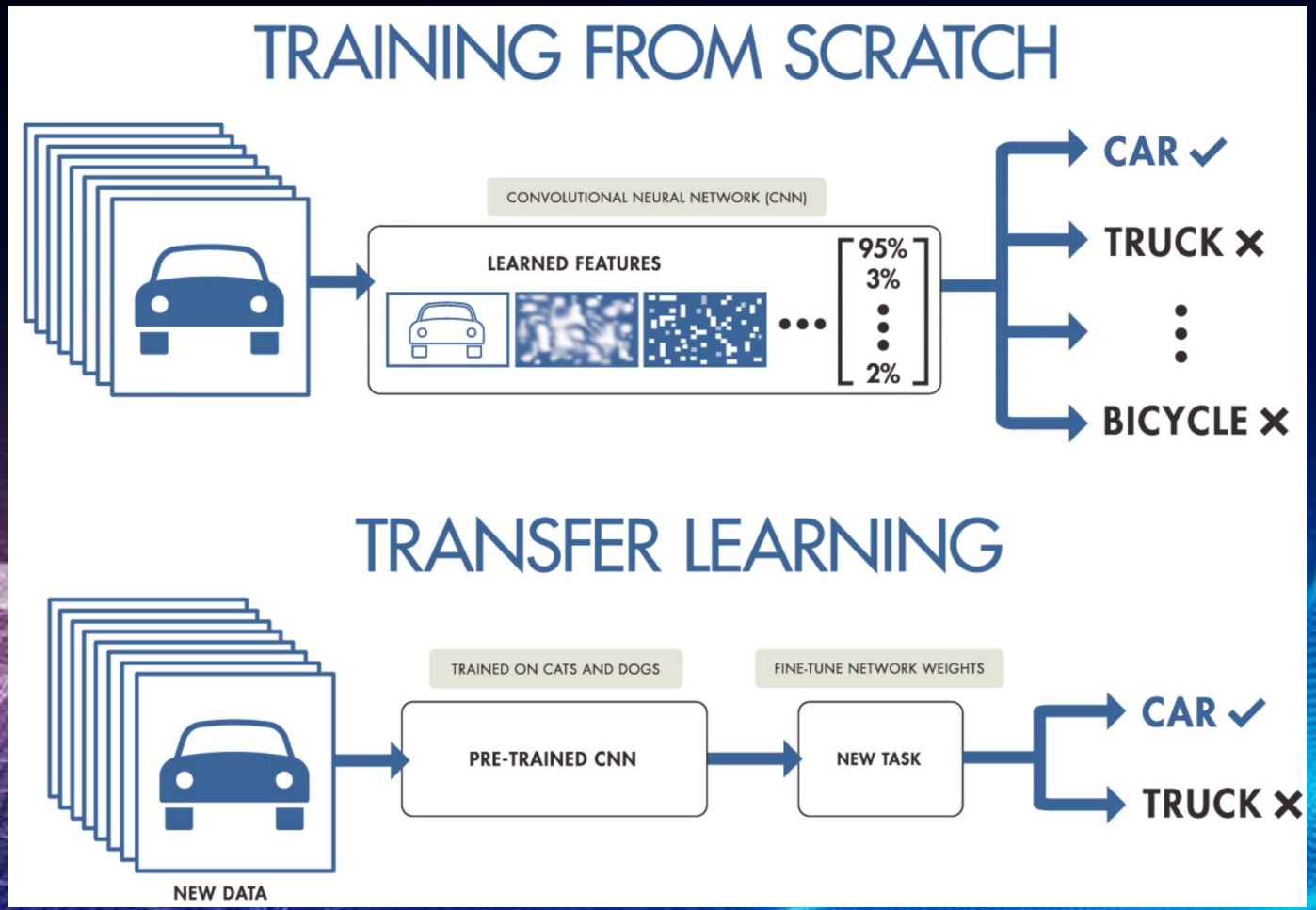
Transfer Learning – Mobilenet V2



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

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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

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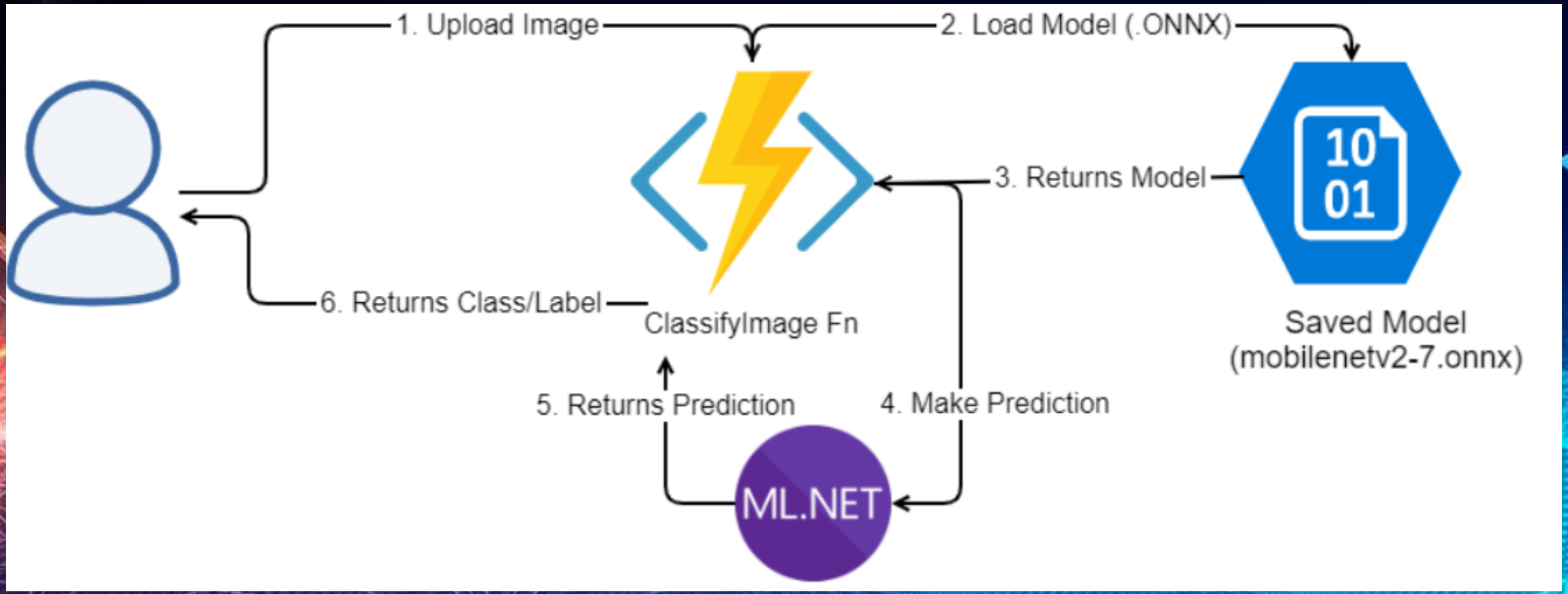
Cloud Architecture



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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

Demo

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Resources

- **Github**: https://github.com/praveenraghuvanshi/tech-sessions/blob/master/04082022-Gira_Latam_2022

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References

- Develop Azure Functions using Visual Studio
- Multipart data with Azure Functions HttpTriggers
- Tutorial: Train an ML.NET classification model to categorize images
- Train a deep learning image classification model with ML.NET and TensorFlow
- Tutorial: Detect objects using ONNX in ML.NET

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Thank you

https://linktr.ee/praveenraghuvanshi

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