



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

Praveen Raghuvanshi

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Introduction

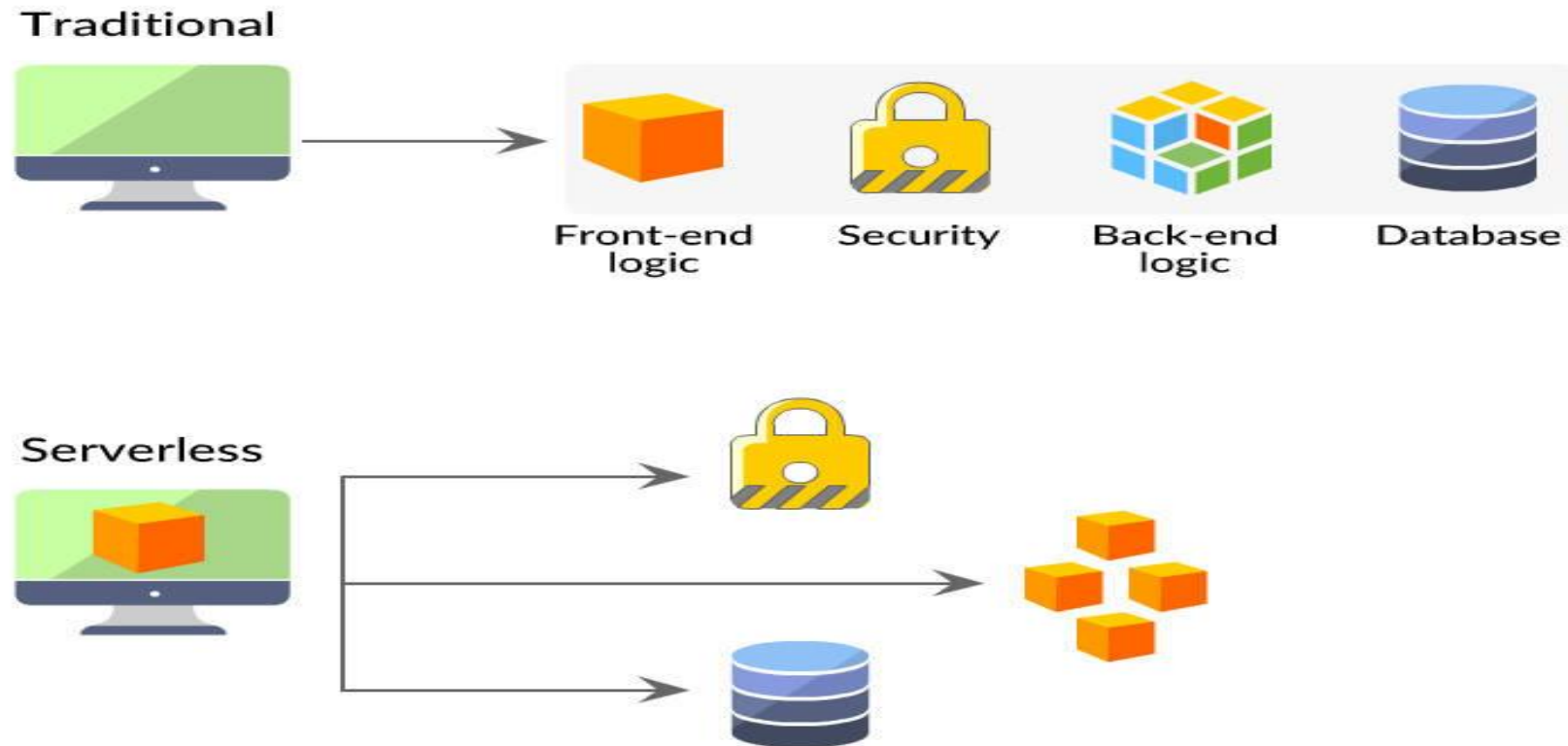
- Cloud Architect @ Harman, A Samsung Company
- Domain: Professional Audio, Video & Control
- Area of Expertise: Cloud, Distributed computing
- Area of Interest: AI/ML and IoT
- Location: Bangalore, India
- Member:



Agenda

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

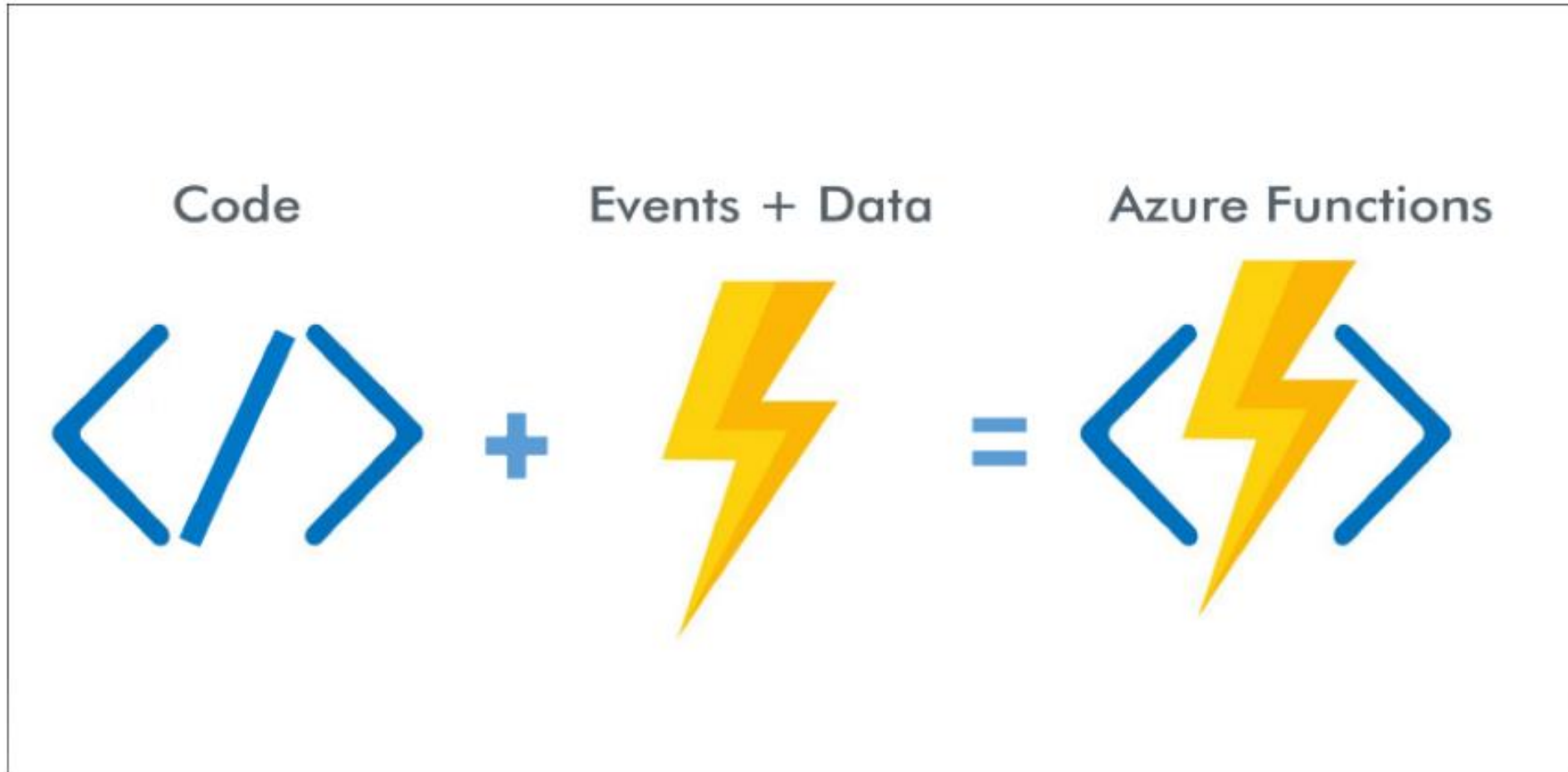
Serverless



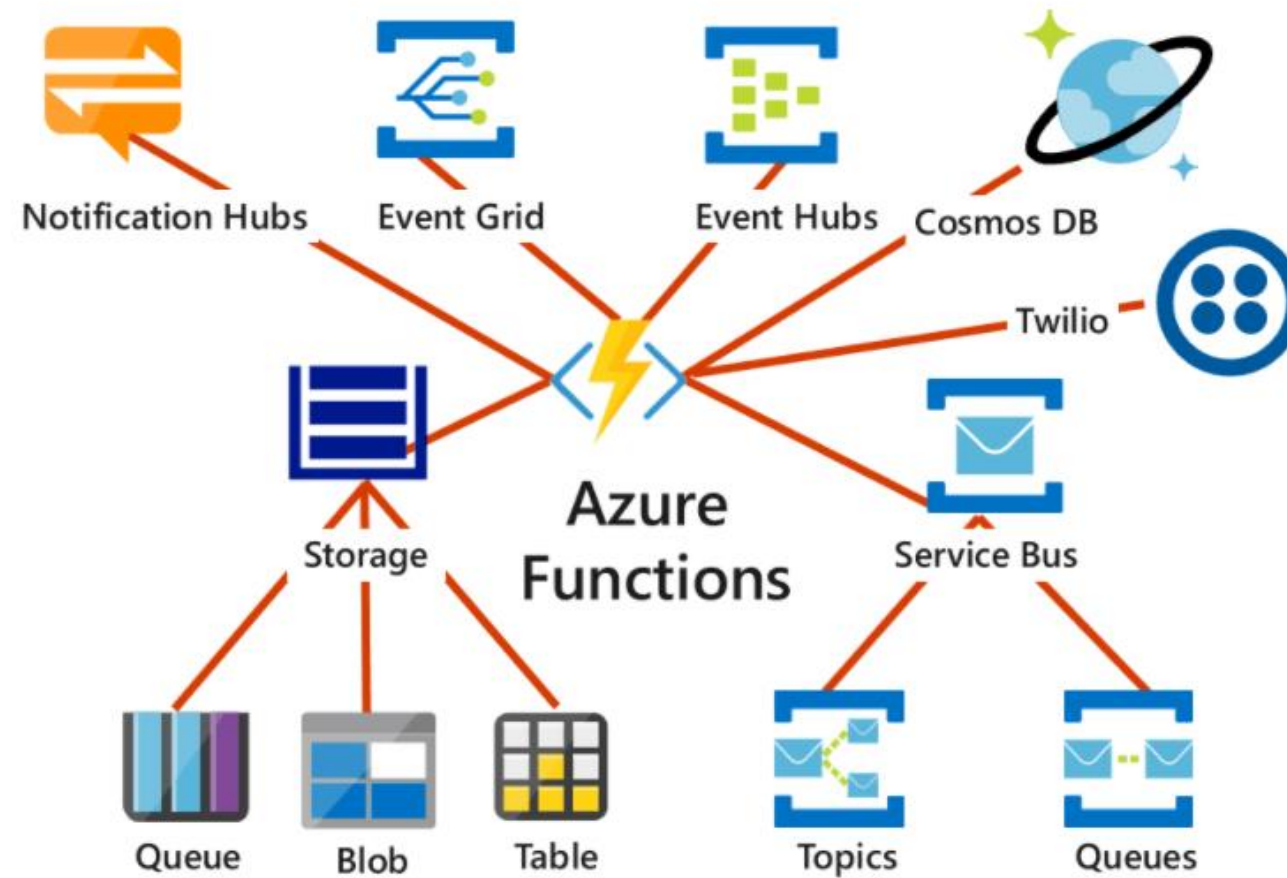
source: <https://danielhkim.net/2020/02/27/serverless-cloud-computing/>

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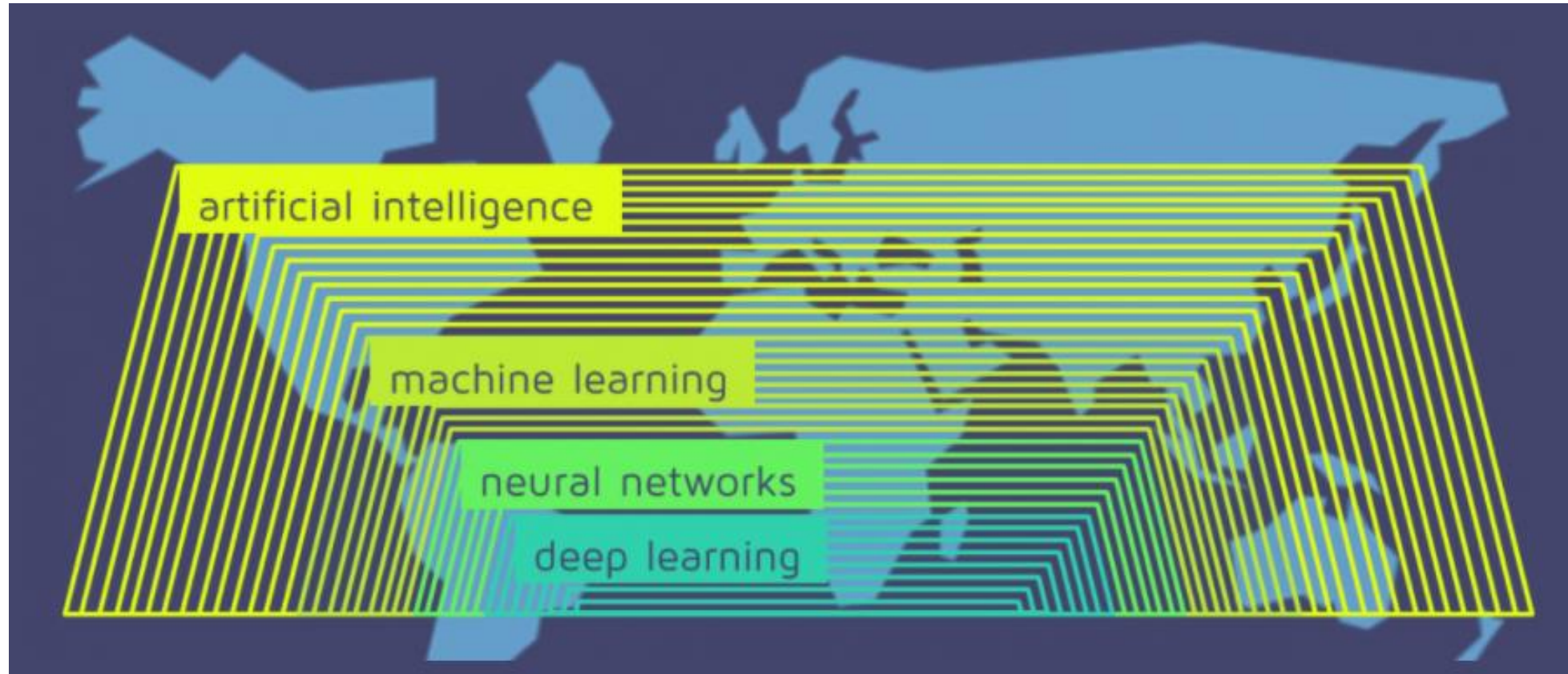
Azure Functions



Azure Functions

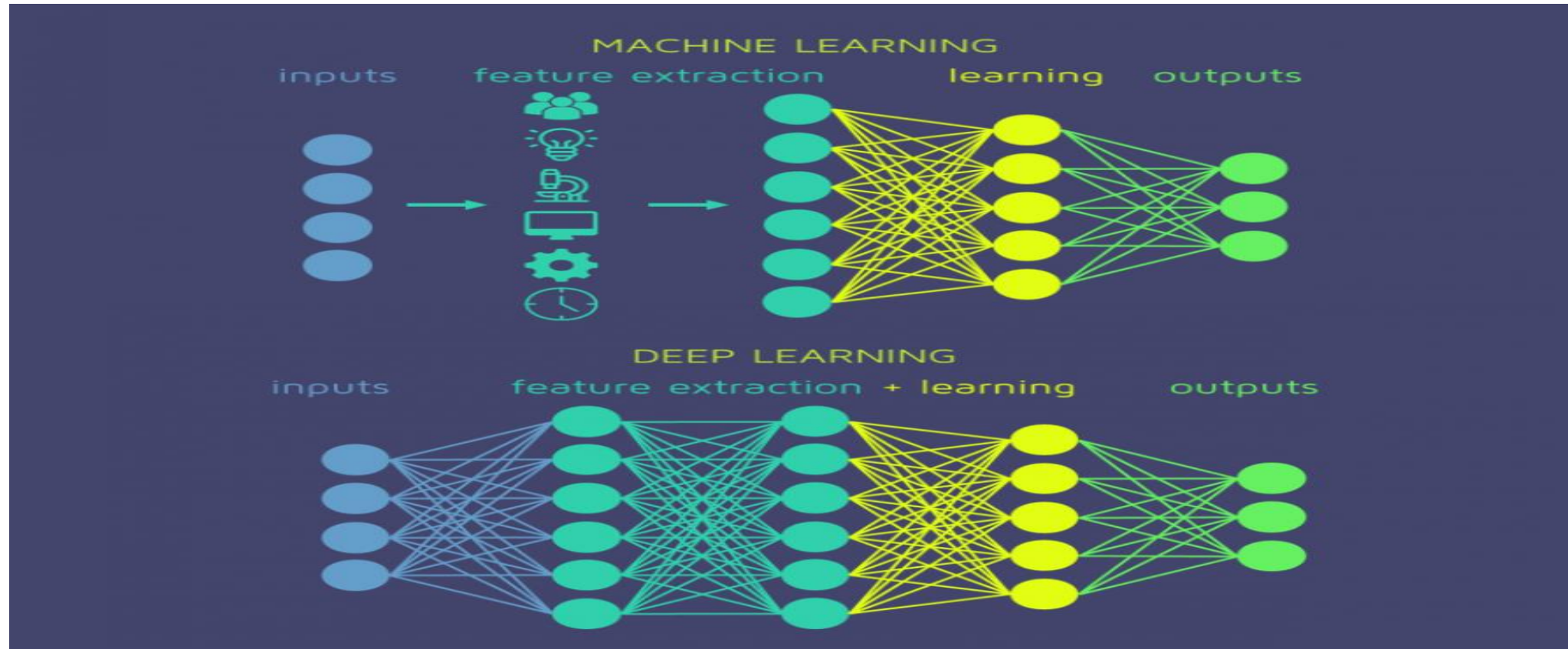


Deep Neural Network



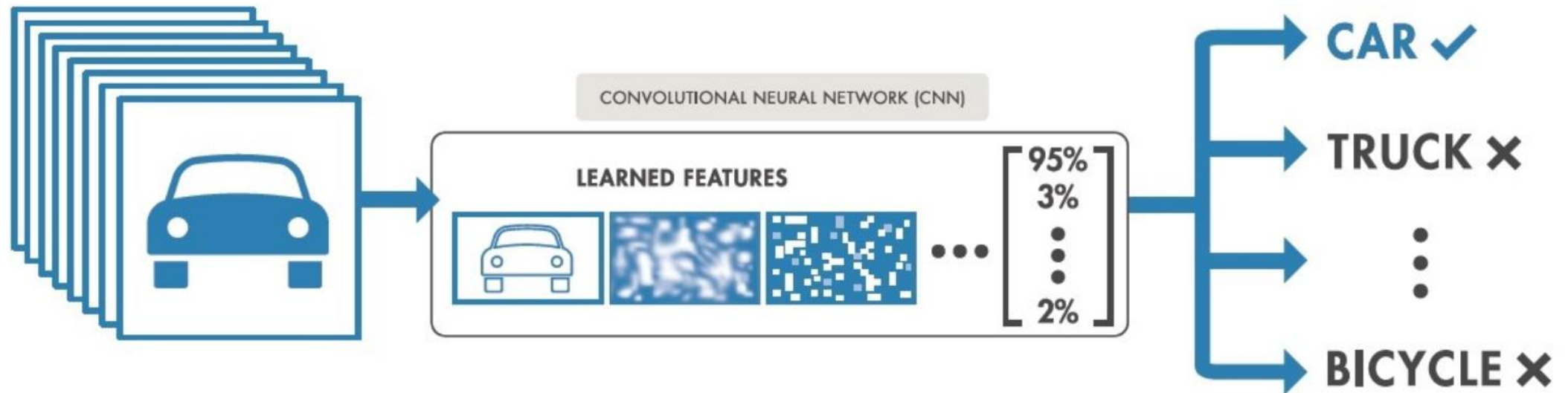
source: <https://quantdare.com/what-is-the-difference-between-deep-learning-and-machine-learning/>

Deep Neural Network



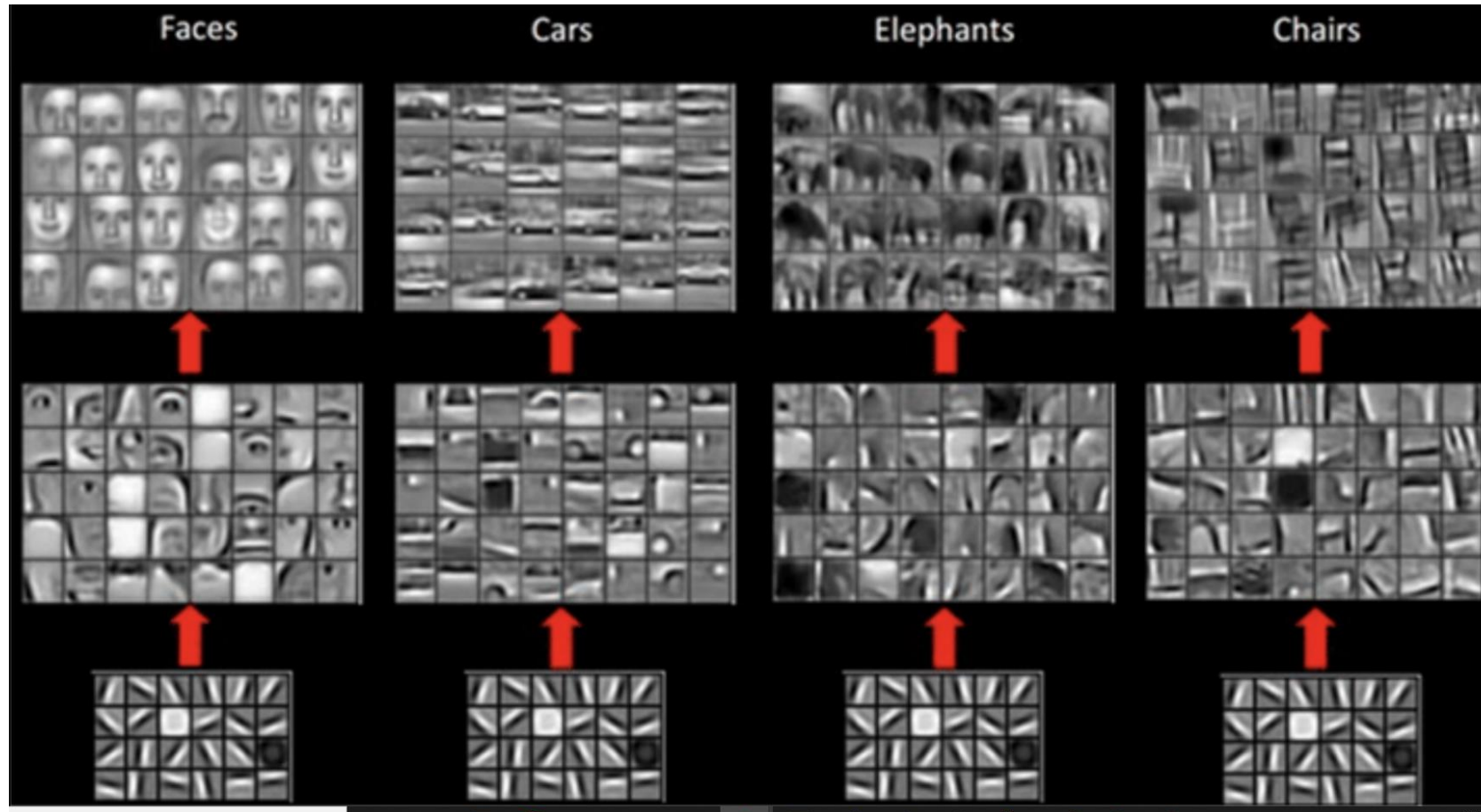
source: <https://quantdare.com/what-is-the-difference-between-deep-learning-and-machine-learning/>

Image Classification



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

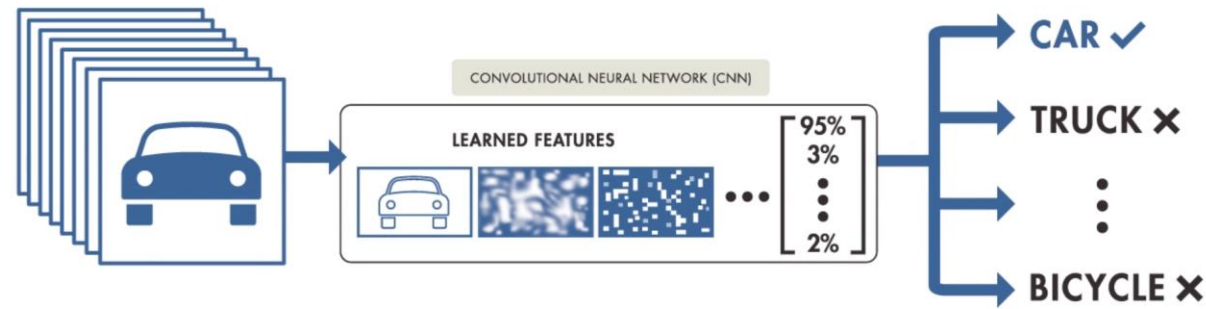
Image Classification



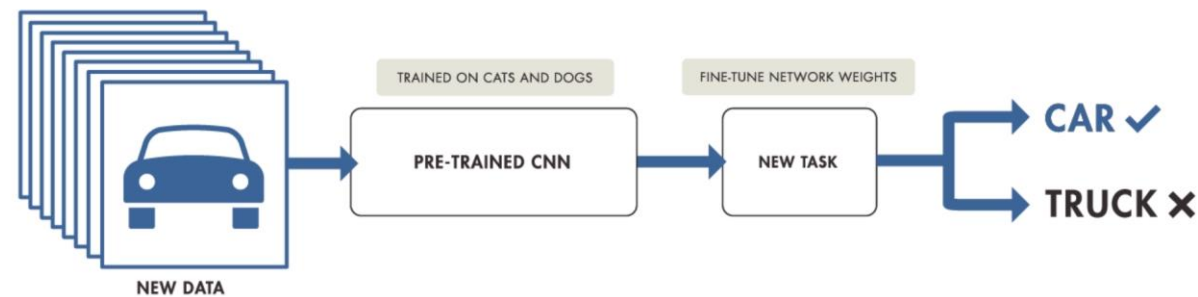
source: https://miro.medium.com/max/1910/1*fLGuAUT5imTIG AeA4zzaWA.png
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Transfer Learning – MobileNet V2

TRAINING FROM SCRATCH




TRANSFER LEARNING



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

ML.Net

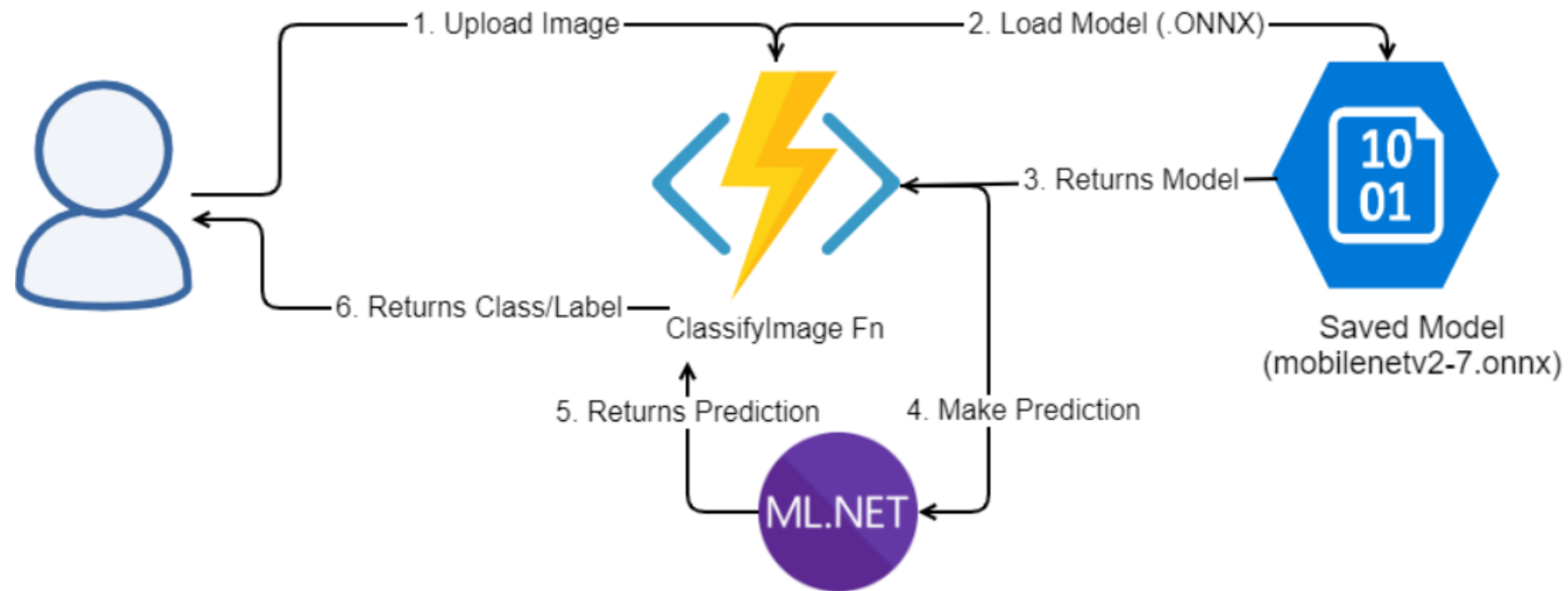
ML.NET
Machine Learning framework made for .NET developers









- 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

 <p>Asgard Systems</p> <p>Asgard Systems uses demand forecasting in grocery stores to reduce food waste and gas house emissions.</p> <p>Learn more ></p>	 <p>Scancam</p> <p>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.</p> <p>Learn more ></p>	 <p>SigParser</p> <p>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.</p> <p>Learn more ></p>
 <p>endjin</p> <p>endjin uses ML.NET with AutoML to improve the process of classifying articles for their Azure newsletter and to revolutionize simple, everyday tasks.</p> <p>Learn more ></p>	 <p>Microsoft Real Estate & Security</p> <p>Microsoft Real Estate & Security uses ML.NET to detect and classify HVAC system faults on Microsoft's campus and convert them to work orders.</p> <p>Learn more ></p>	 <p>Power BI</p> <p>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.</p> <p>Learn more ></p>

<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/07022022-CloudWorld-2022>

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>

Thank you

Q & A



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