



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

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Introduction

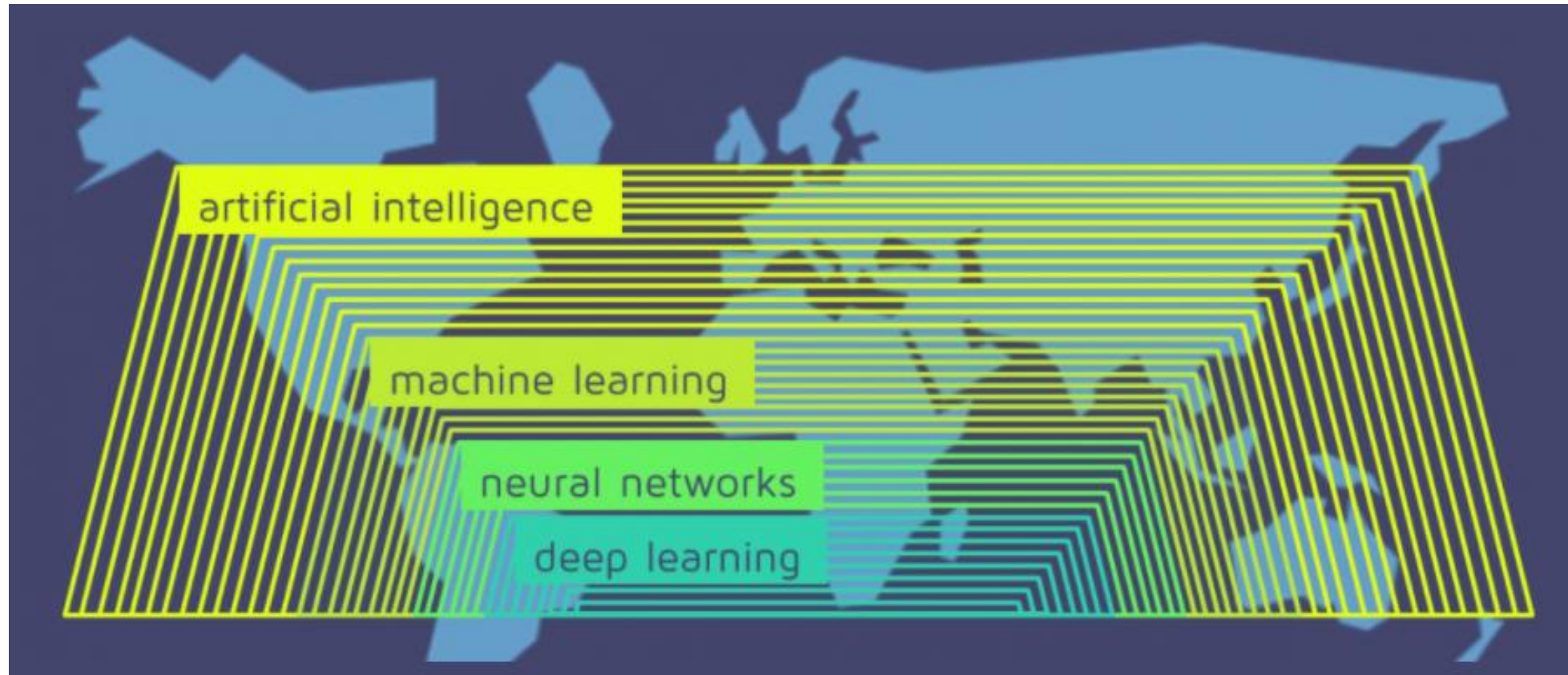
- Cloud Architect @ Harman, A Samsung Company
- Domain: Professional Audio, Video & Control
- Area of Expertise: Cloud, Distributed computing
- Area of Interest: AI/ML, Cloud and IoT
- Location: Bangalore, India
- Member:



Agenda

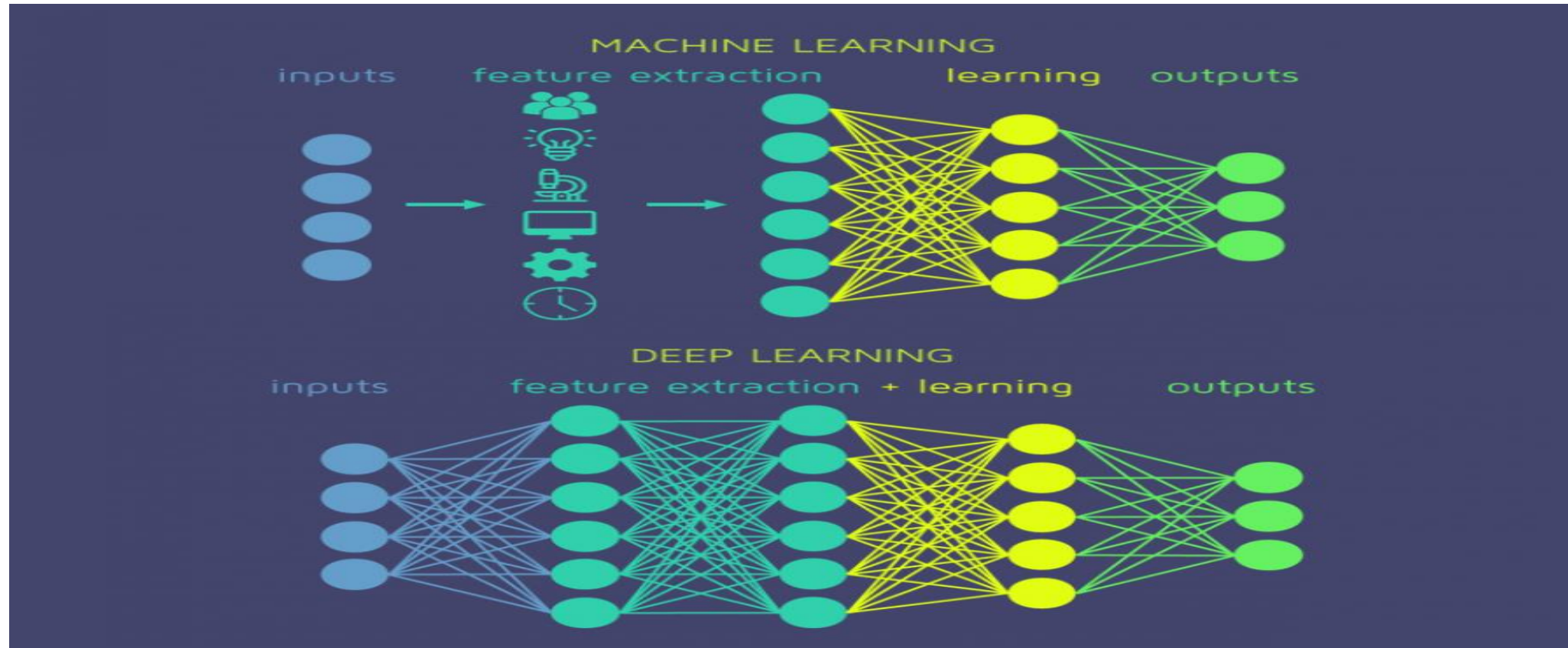
- Deep Neural Network
- Serverless
- Azure Functions
- ML.Net
- Demo

Deep Neural Network



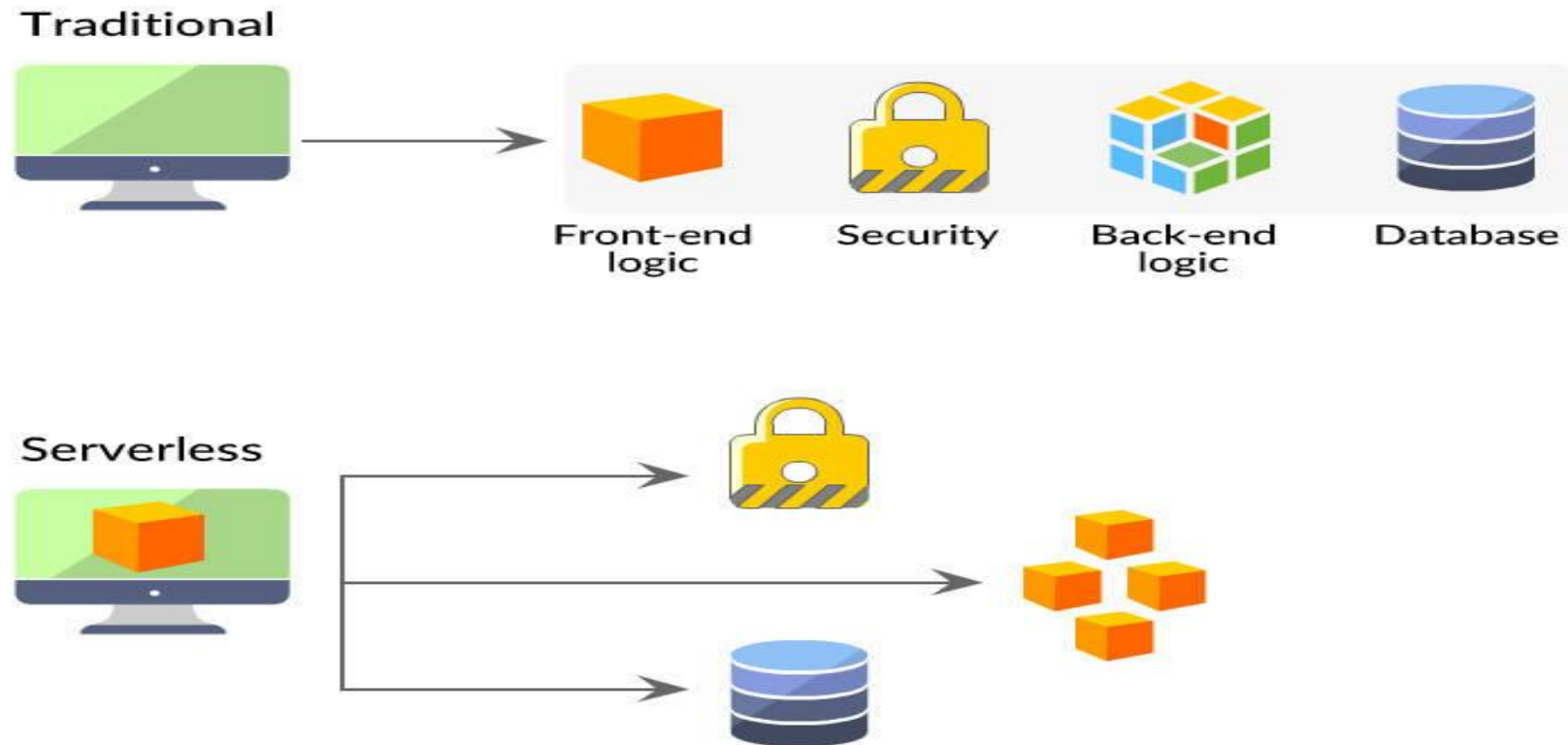
source: <https://quantdare.com/what-is-the-difference-between-deep-learning-and-machine-learning/>

Deep Neural Network



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

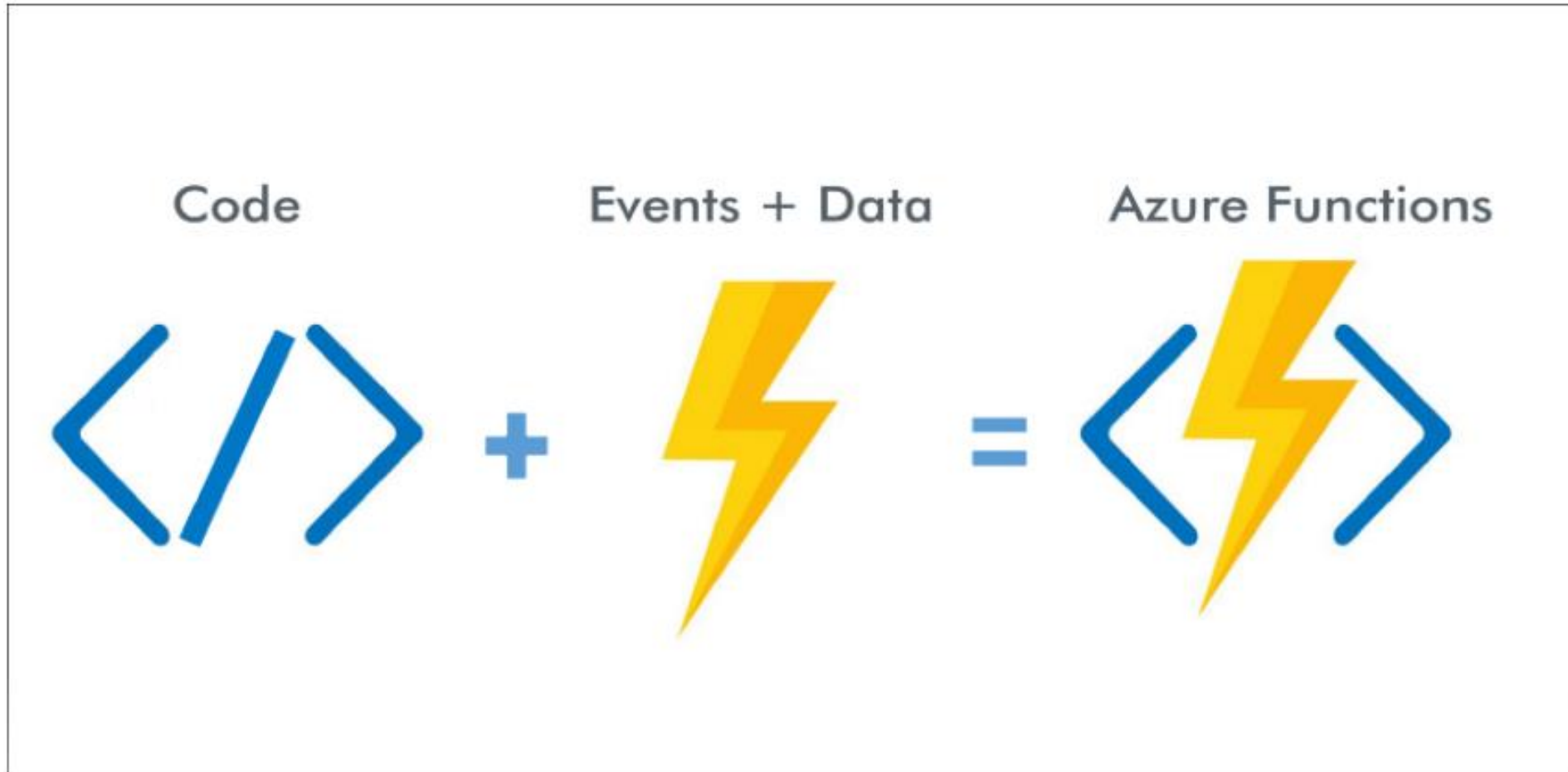
Serverless



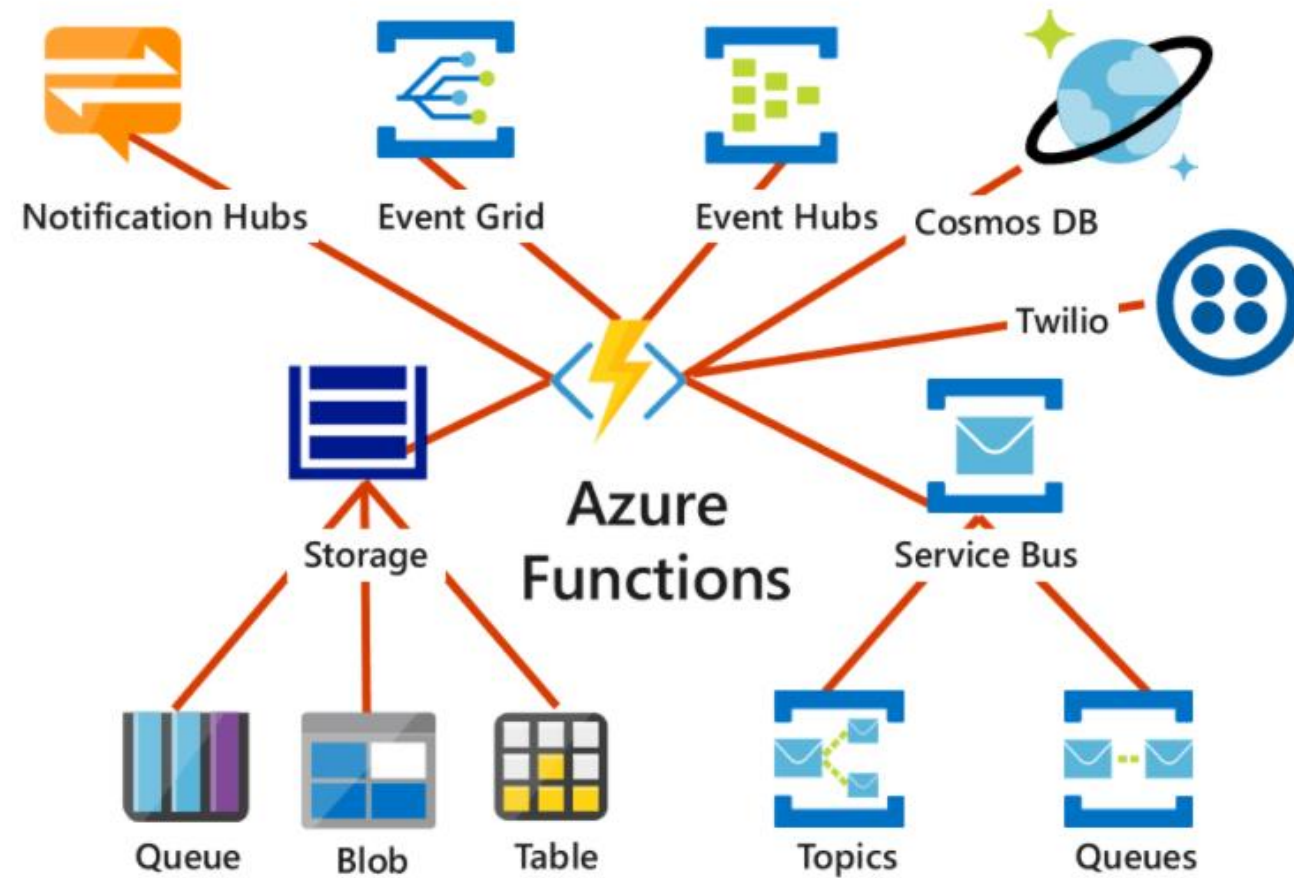
source: <https://danielhkim.net/2020/02/27/serverless-cloud-computing/>

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Azure Functions




Azure Functions



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

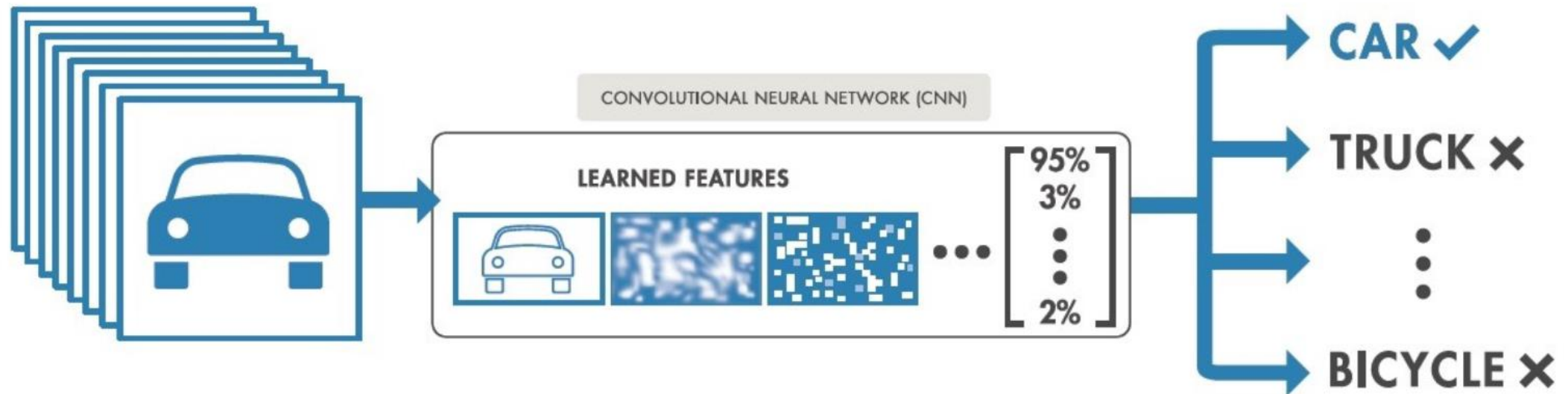


Open source and Cross-platform

Runs on Windows, macOS and Linux and developed in the open on GitHub

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

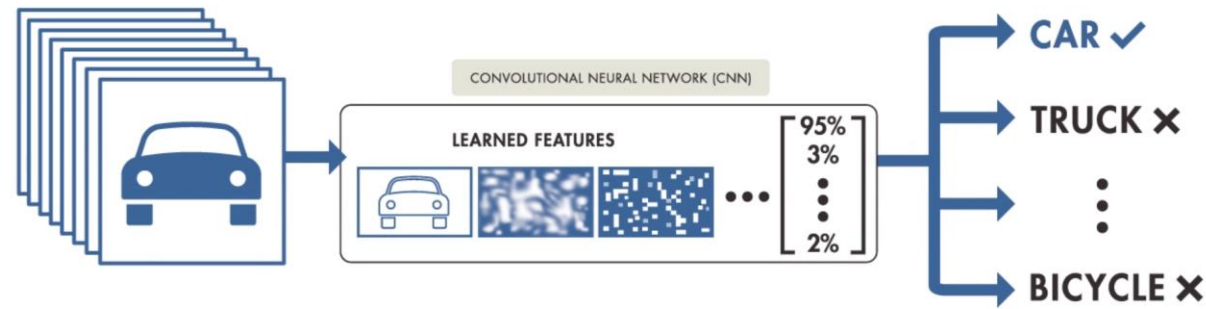
Image Classification



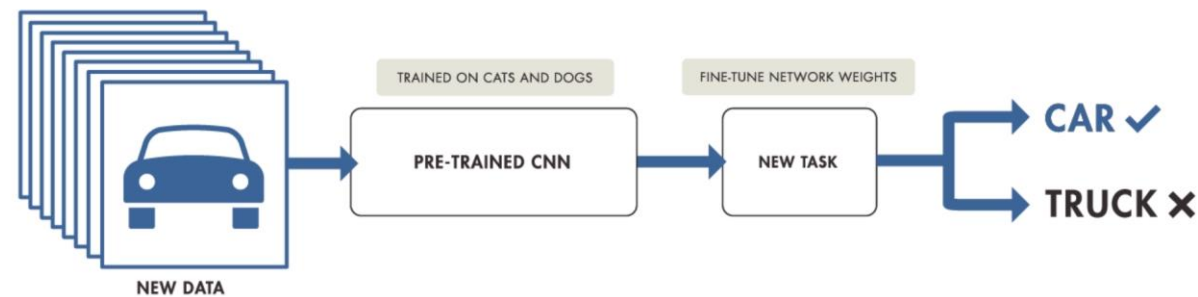
Source : MathWorks (<https://goo.gl/zondfq>)

Transfer Learning – MobileNet V2

TRAINING FROM SCRATCH

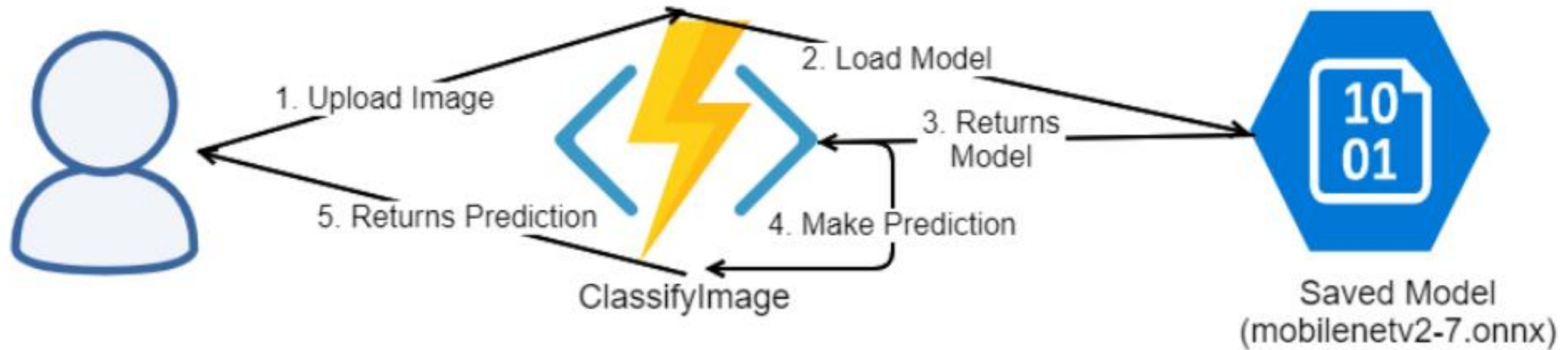


TRANSFER LEARNING



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







Cloud Architecture



Demo

1. Create a Azure Function App
2. Save MobileNetV2 model to Azure Storage Blob
3. Create ClassifyImage API
4. Load model in Azure Function
5. Make Prediction
6. Test through Postman – Locally
7. Deploy to Azure Functions on Cloud.

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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Resources

Github: <https://github.com/praveenraghuvanshi/tech-sessions/tree/master/04092020-ServerlessDays-ANZ-2020>

References

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

Thank you

Q & A