

Meu projeto de Deep Learning com Oracle Data Science!

Erik Gama

Trilha Inovação com dados em nuvem

Meu projeto de Deep Learning com Oracle Data Science!

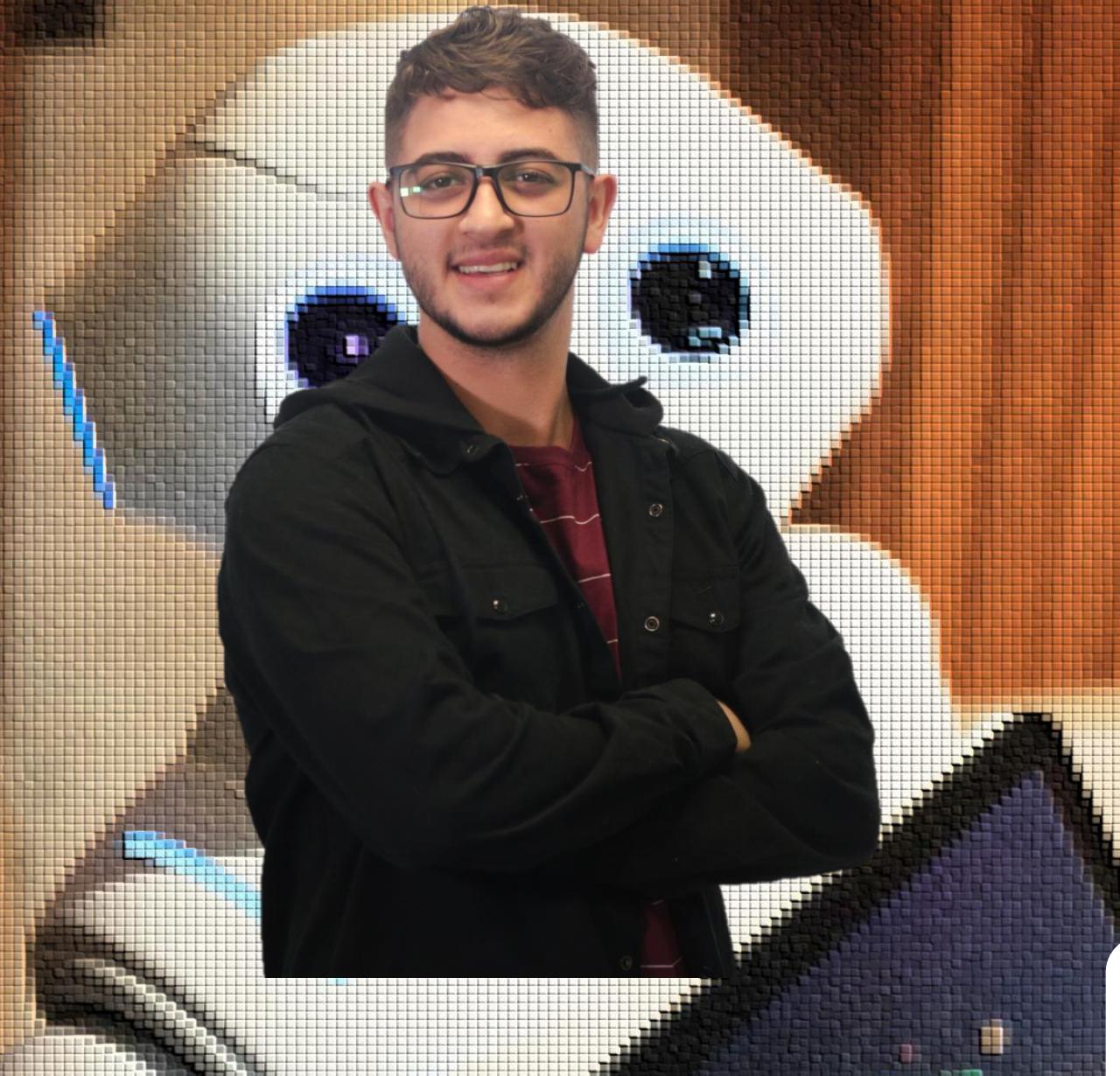
Erik Gama

Trilha Inovação com dados em nuvem

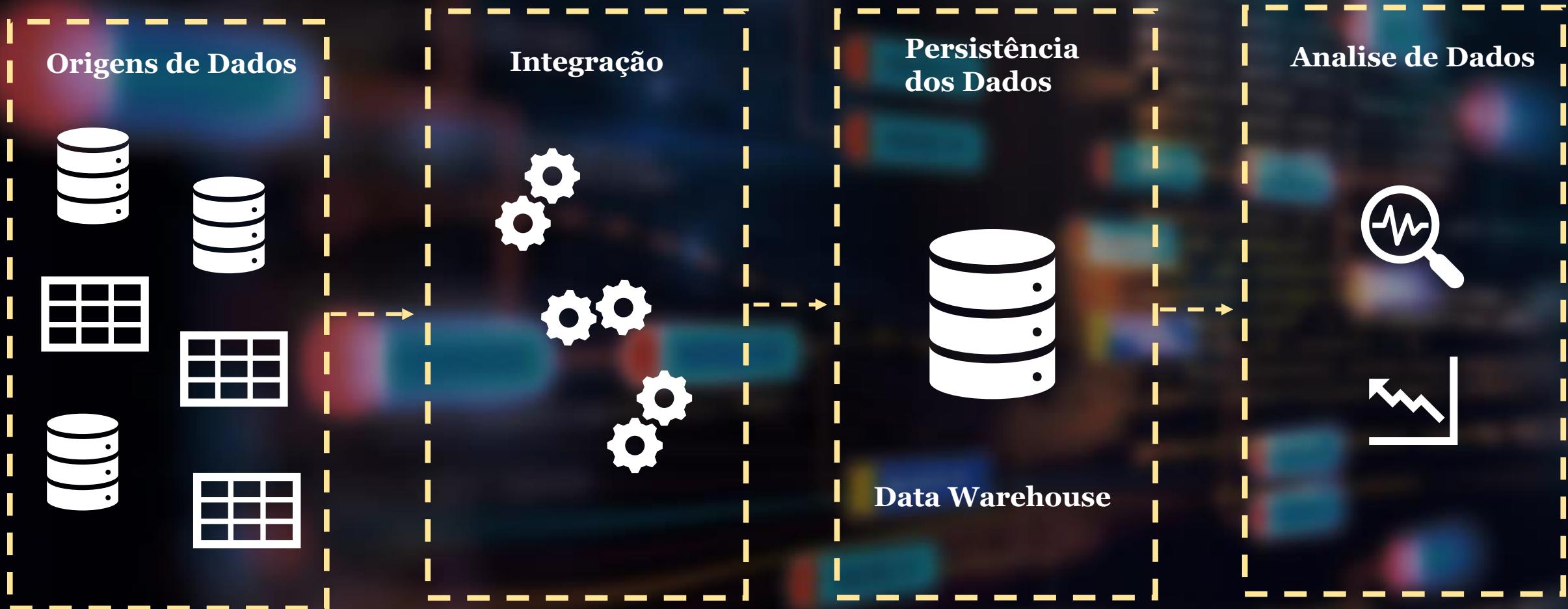


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Erik Gama



Recaptulando....



Recaptulando....

Origens de Dados



Banco de Dados



Softwares



Arquivos

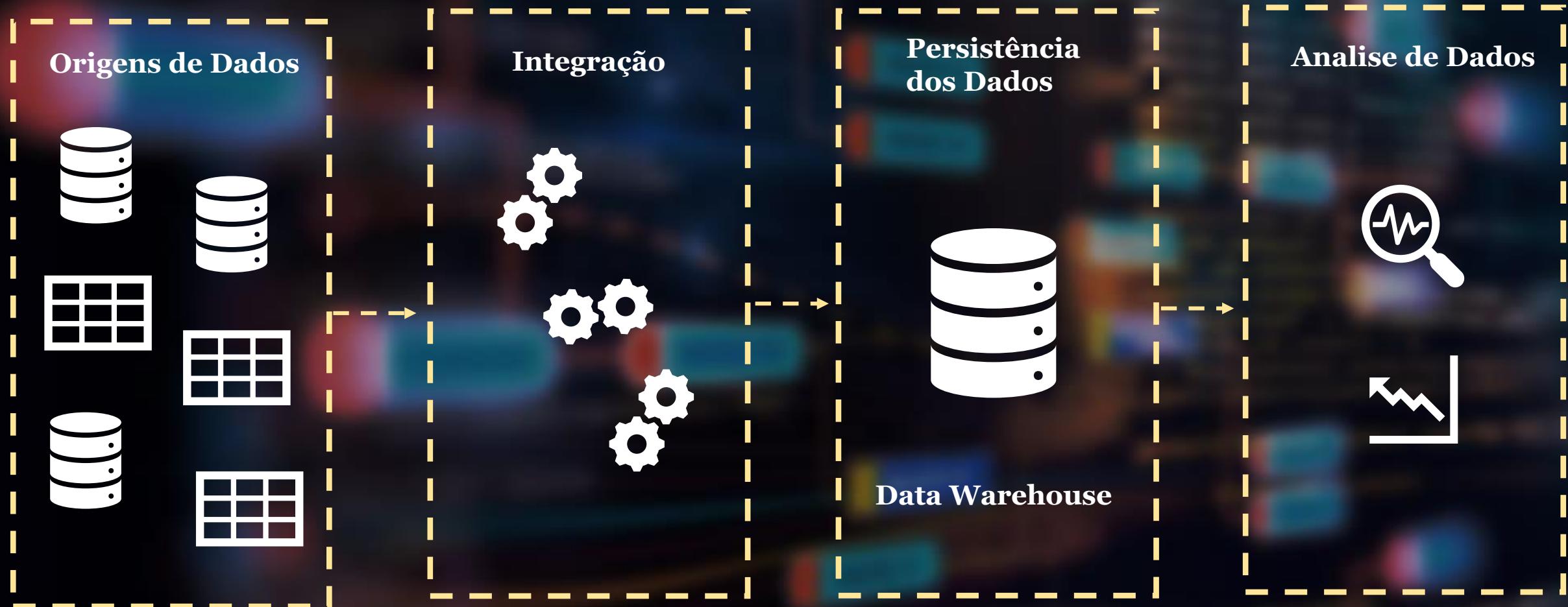
Recaptulando....



Recaptulando....



Recaptulando....

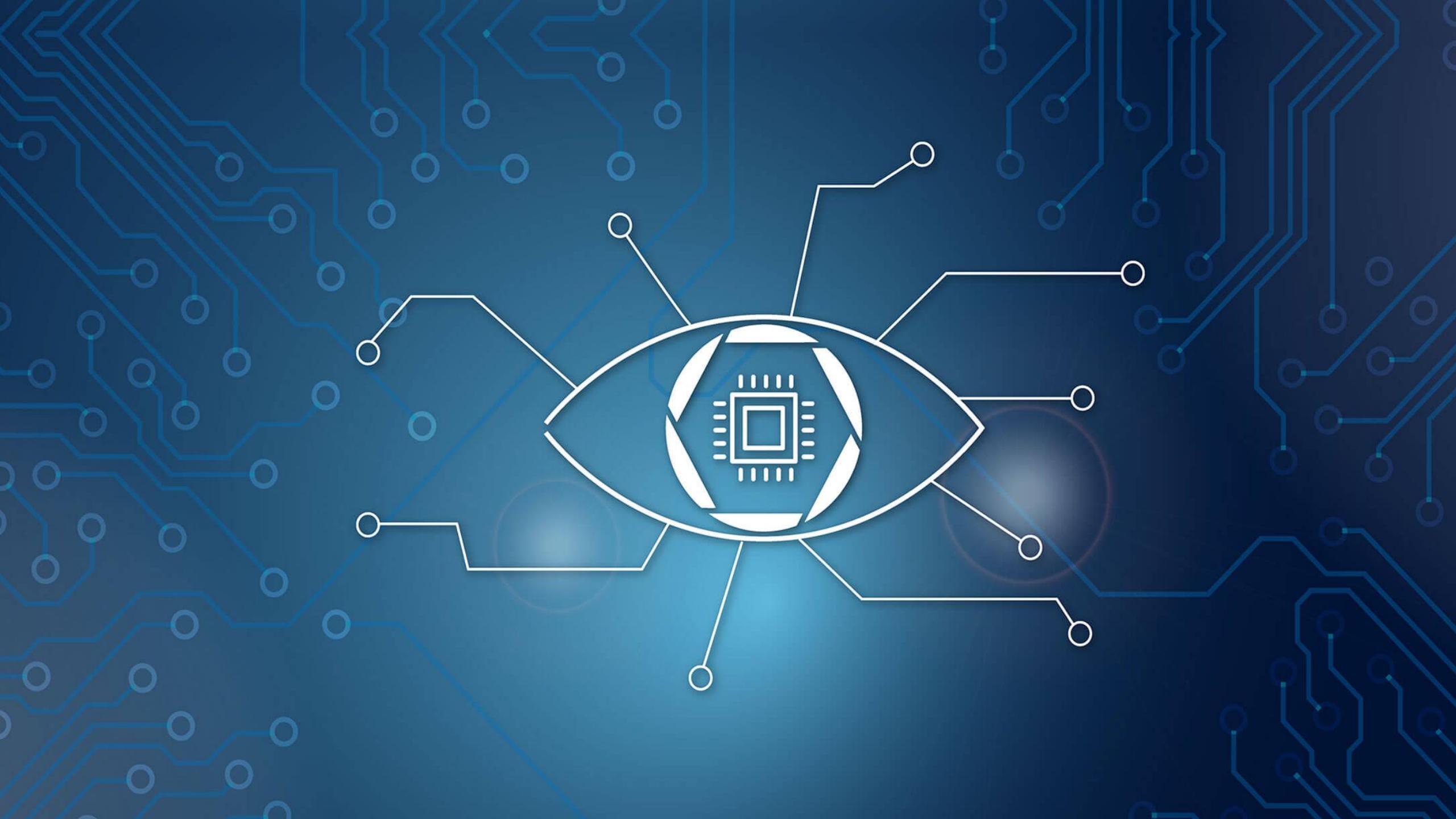


Recaptulando....



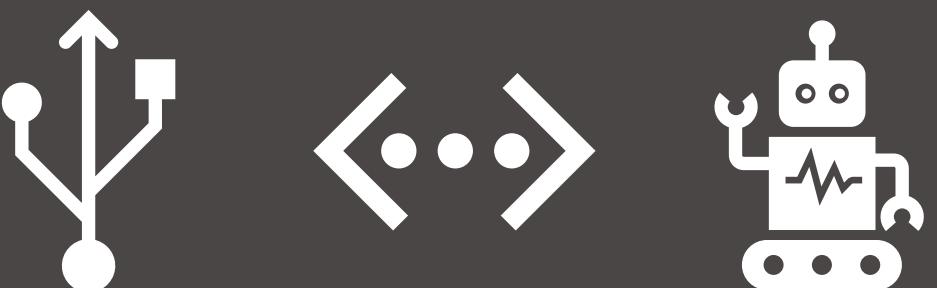
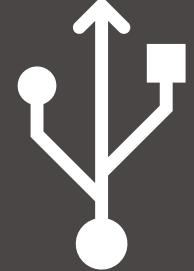
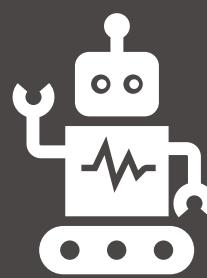


TIA



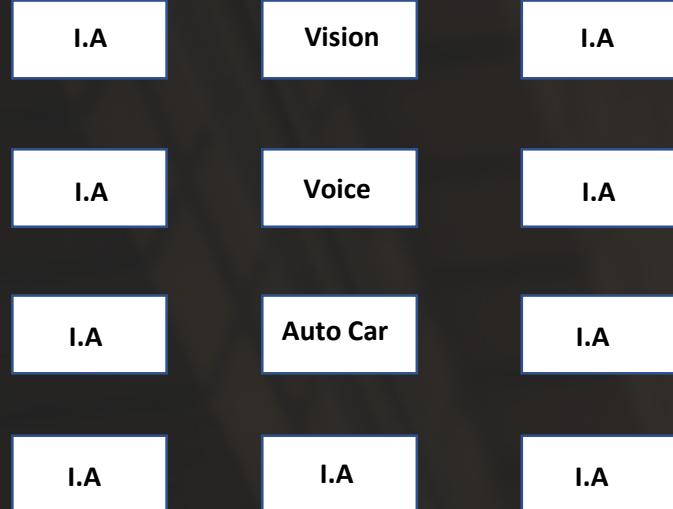




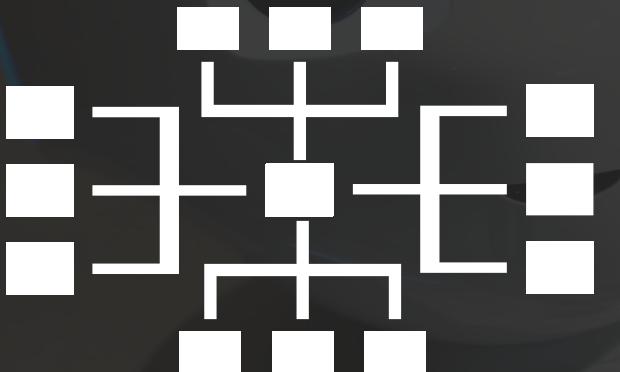


Tipos de Inteligência Artificial

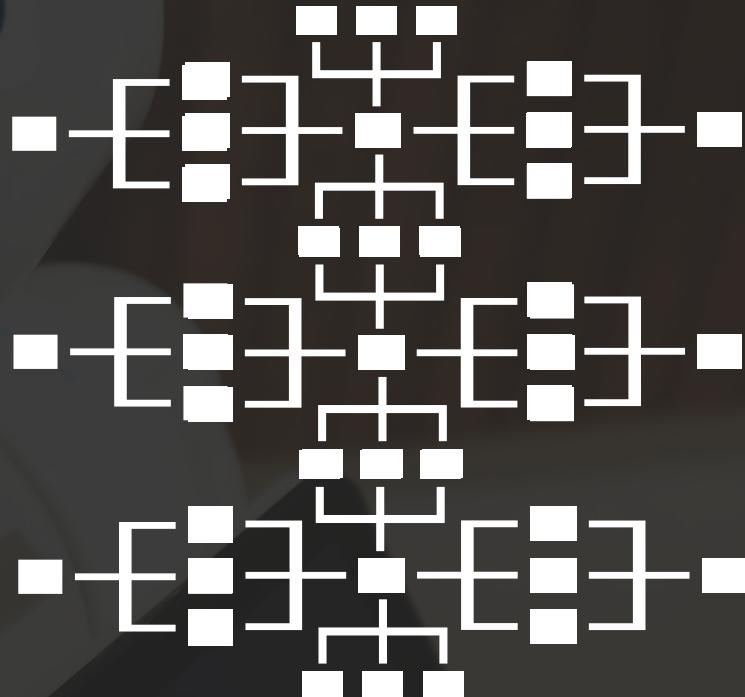
Artificial Narrow Intelligence (**ANI**)

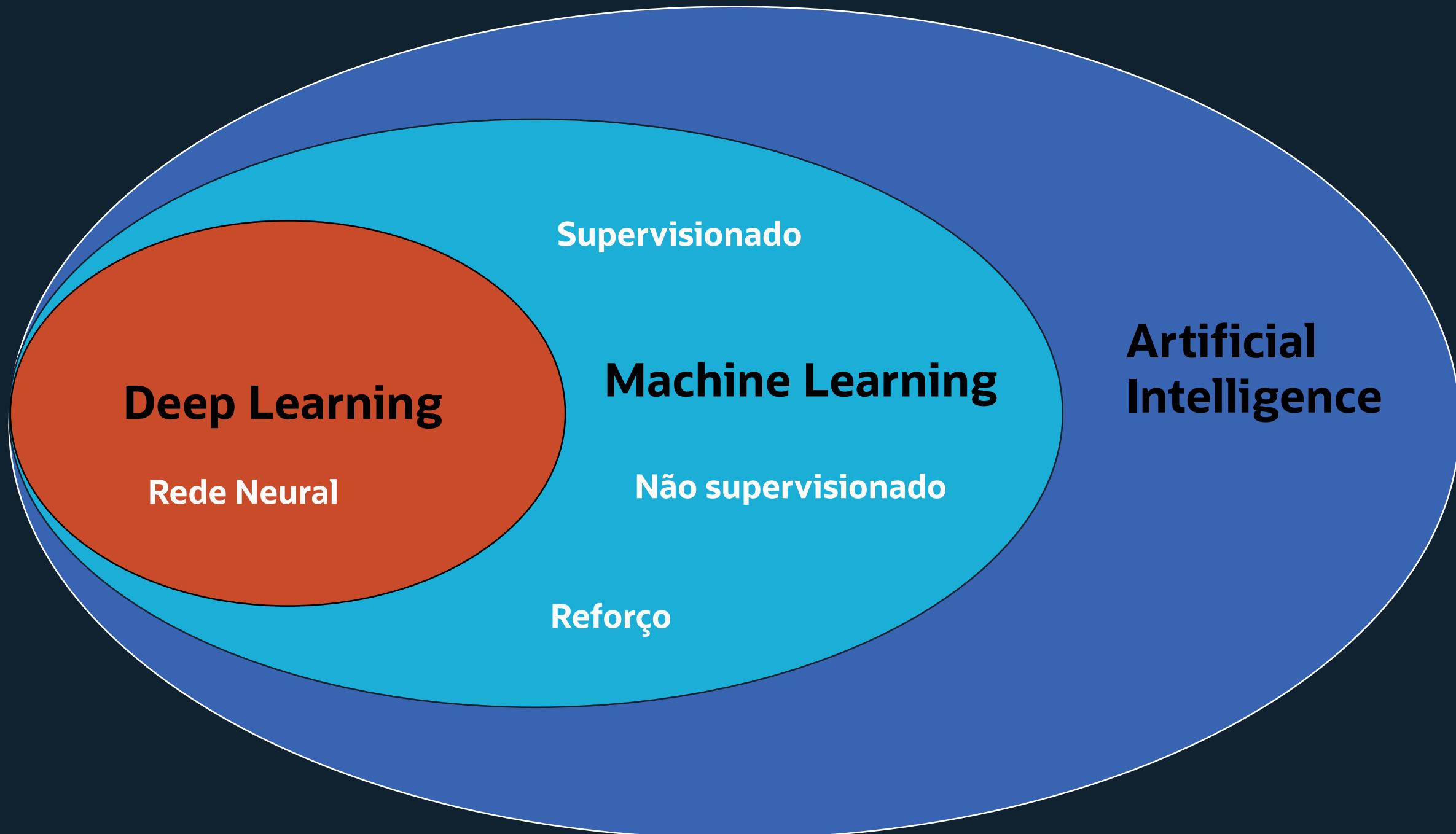


Artificial General Intelligence (**AGI**)



Artificial Superintelligence (**ASI**)







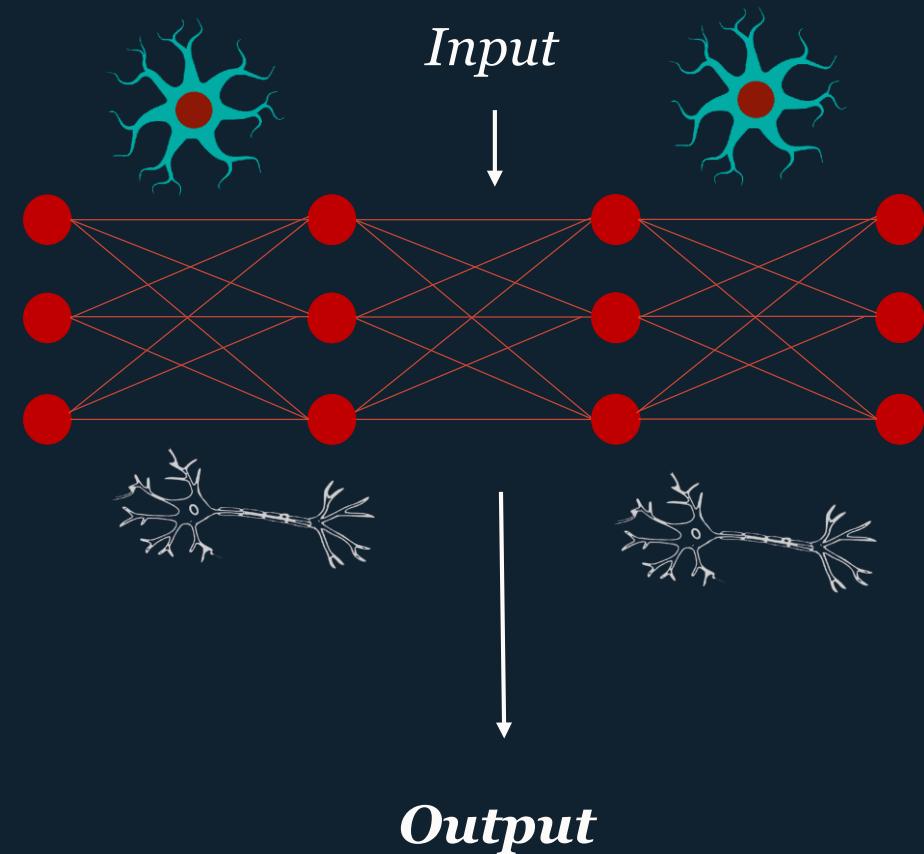
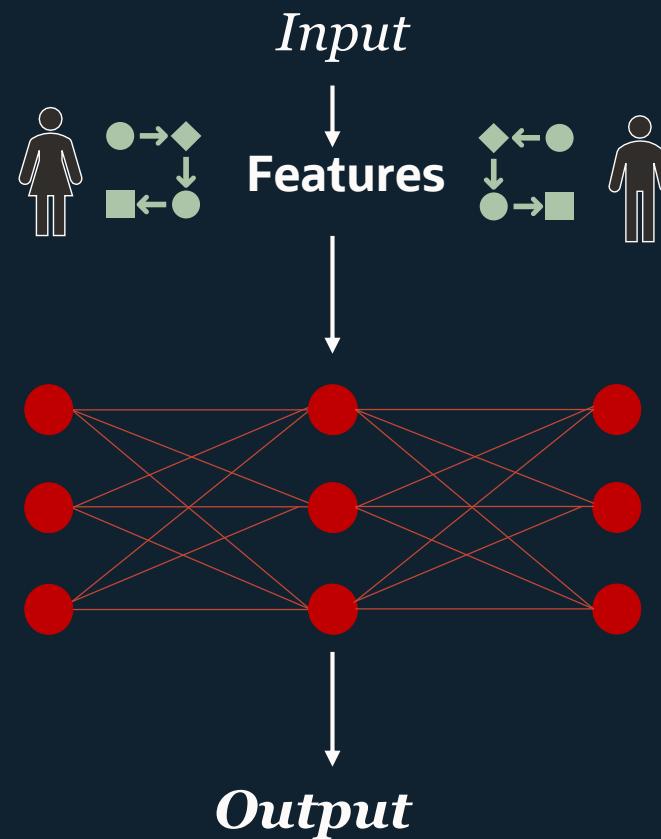
Inteligência Artificial

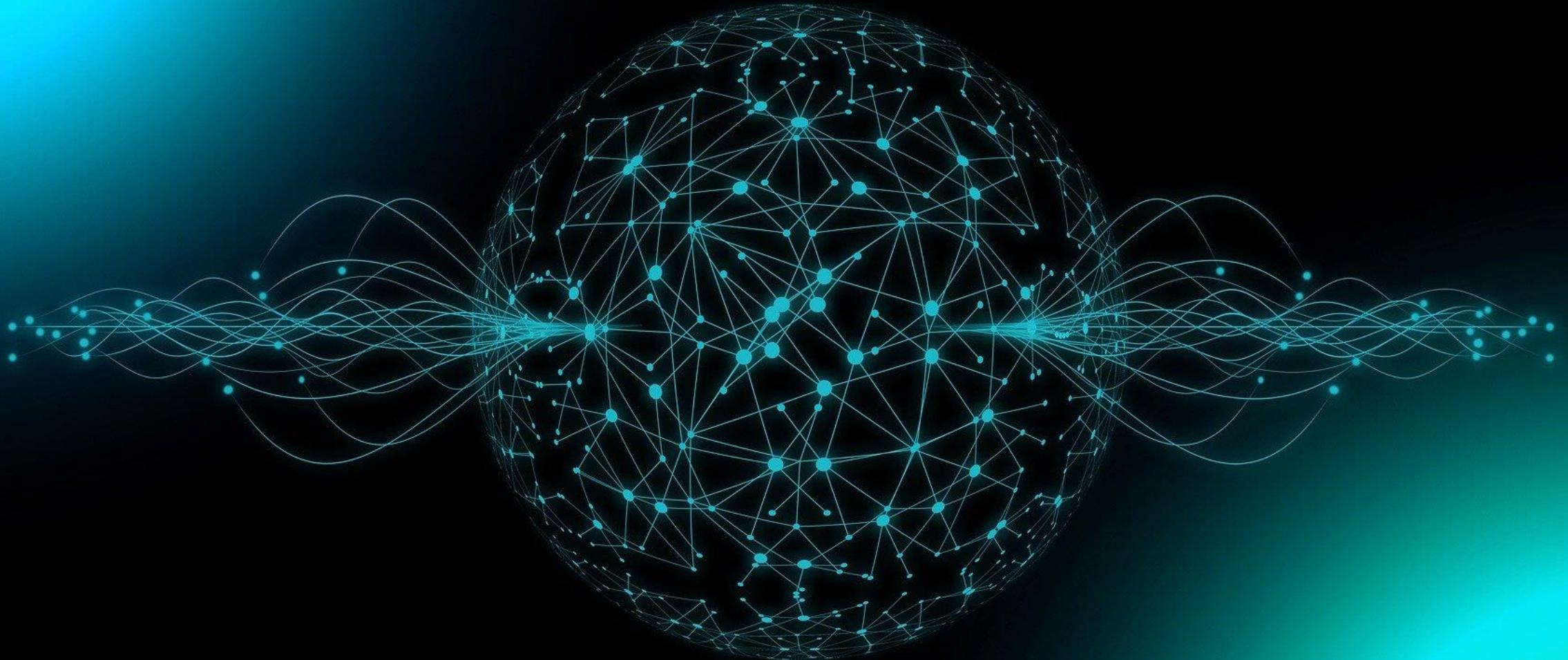


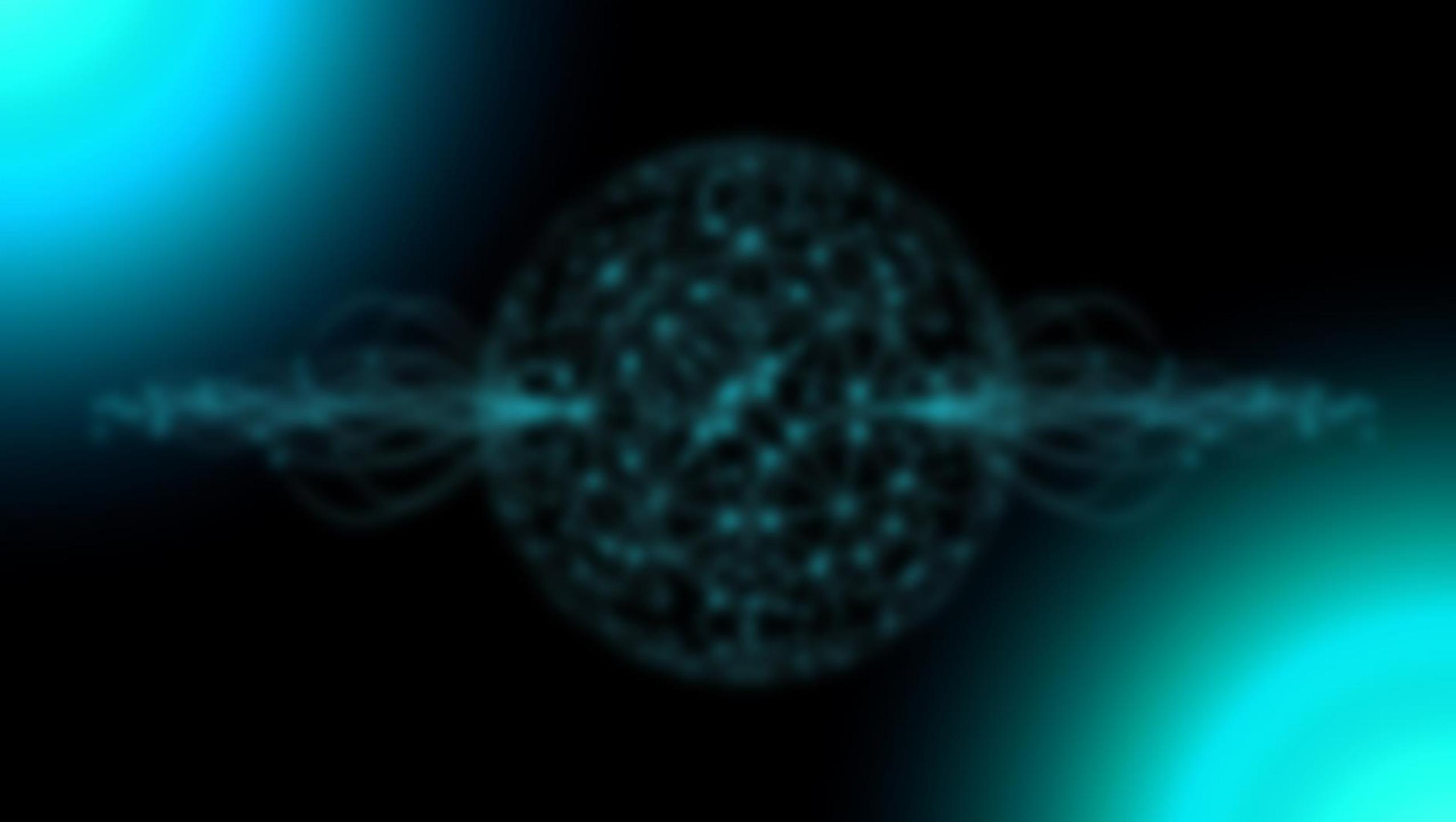
Machine Learning

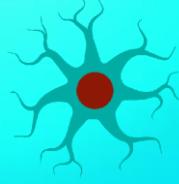
vs

Deep Learning





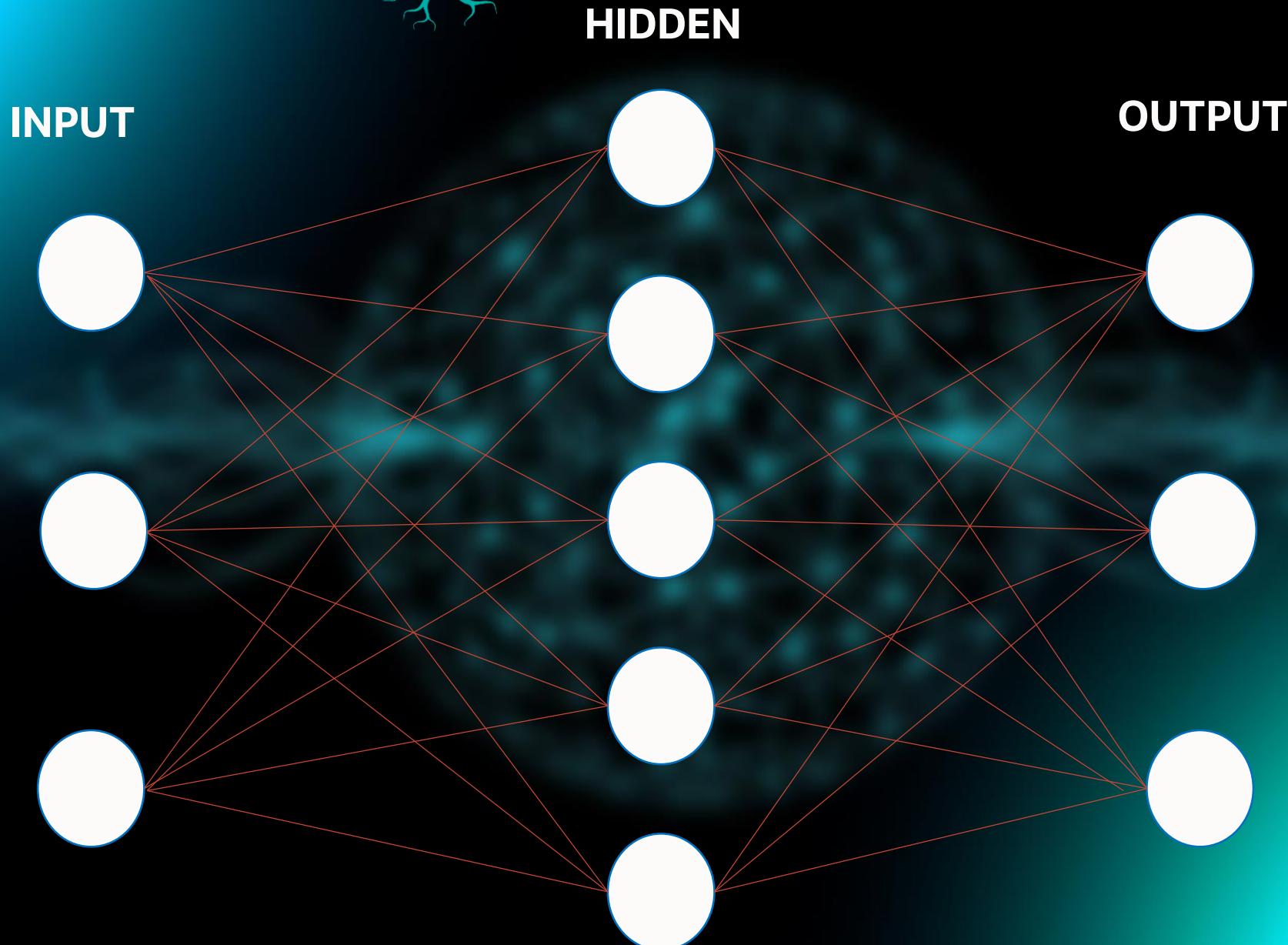


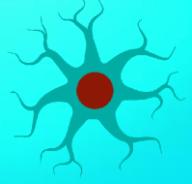


Rede Neural



Feedforward



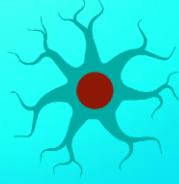


Rede Neural



Feedforward

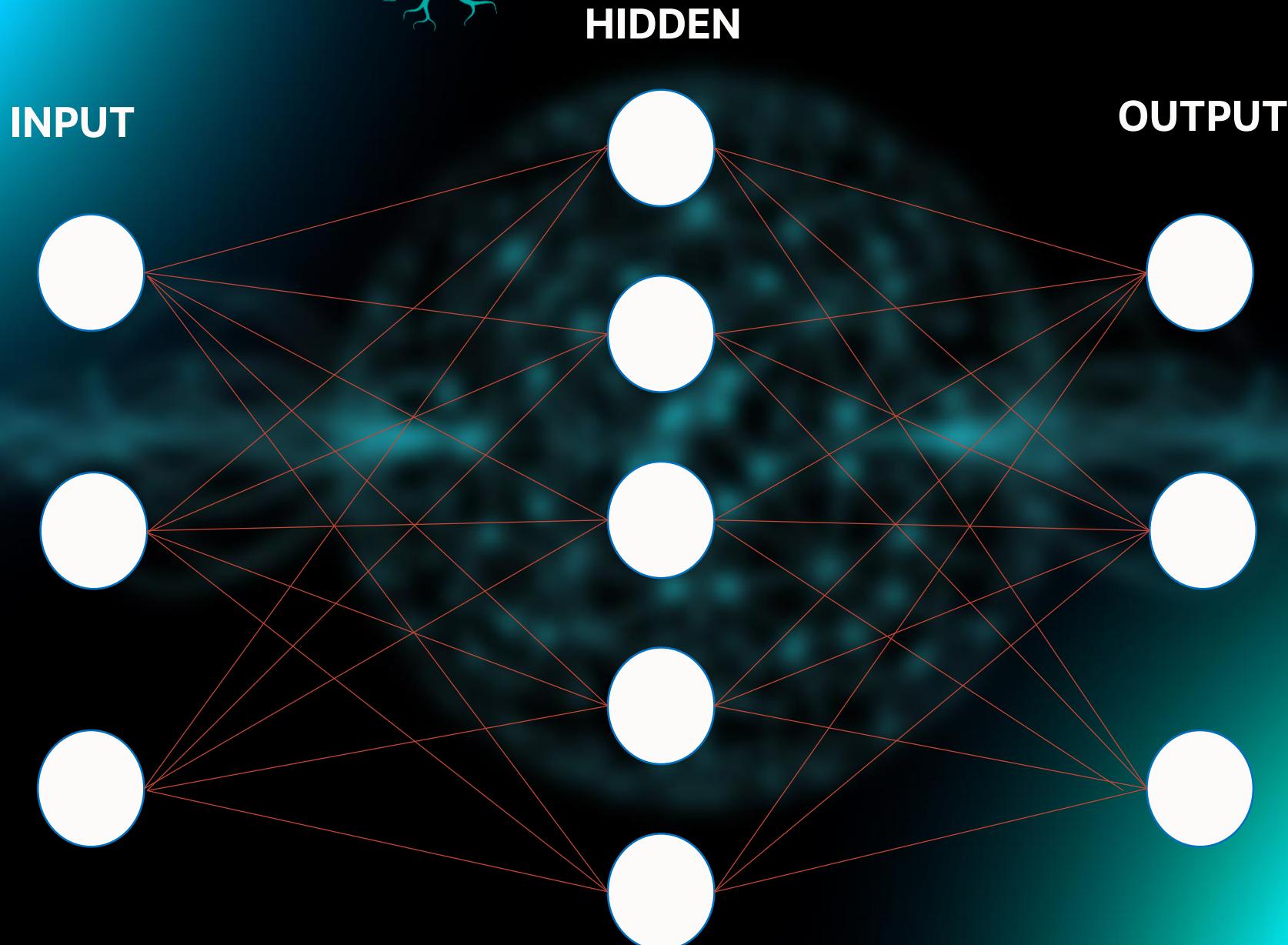


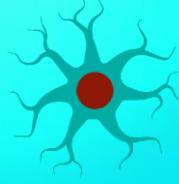


Rede Neural



Feedforward

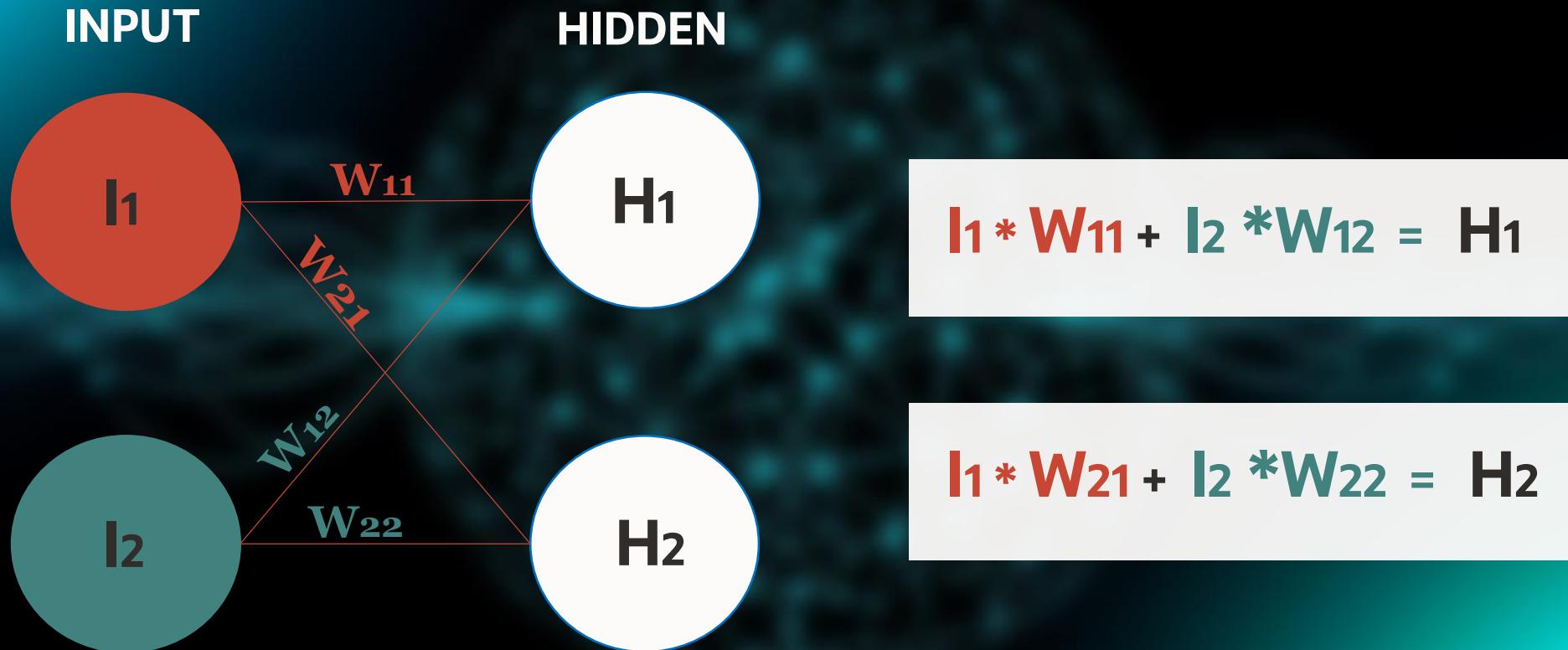


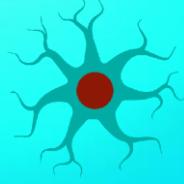


Rede Neural



Feedforward





Rede Neural



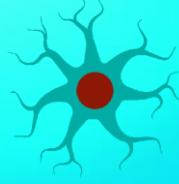
Feedforward

PESOS

INPUT

HIDDEN

$$\begin{bmatrix} W_{11} & W_{12} \\ W_{21} & W_{22} \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} W_{11} * I_1 + W_{12} * I_2 \\ W_{21} * I_1 + W_{22} * I_2 \end{bmatrix}$$



Rede Neural



Feedforward

HIDDEN

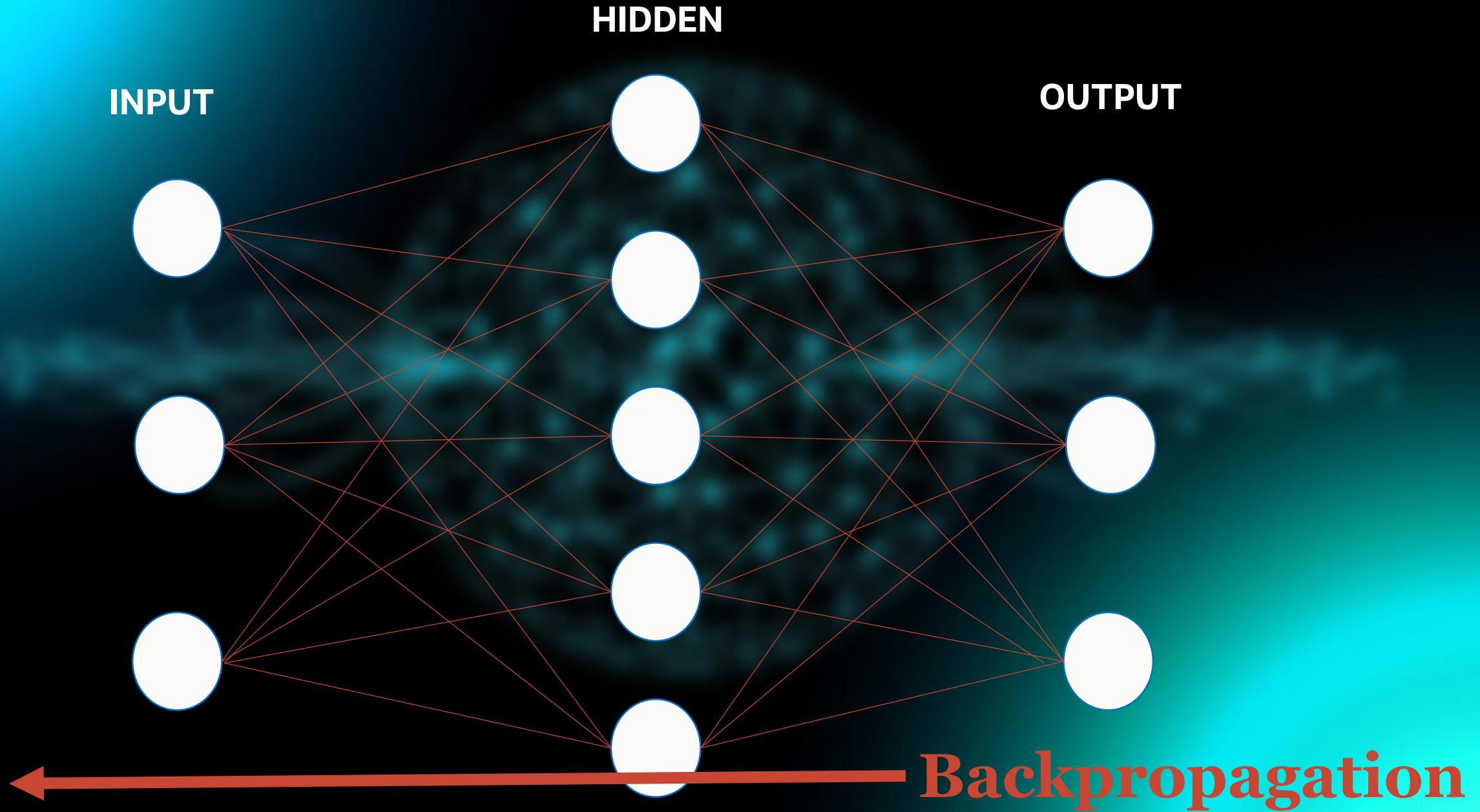
BIAS

HIDDEN

$$\begin{bmatrix} W_{11} * l_1 + W_{12} * l_2 \\ W_{21} * l_1 + W_{22} * l_2 \end{bmatrix} + \begin{bmatrix} b_1 \\ b_2 \end{bmatrix} = f \begin{bmatrix} W_{11} * l_1 + W_{12} * l_2 + b_1 \\ W_{11} * l_1 + W_{22} * l_2 + b_2 \end{bmatrix}$$

FUNÇÃO DE ATIVAÇÃO

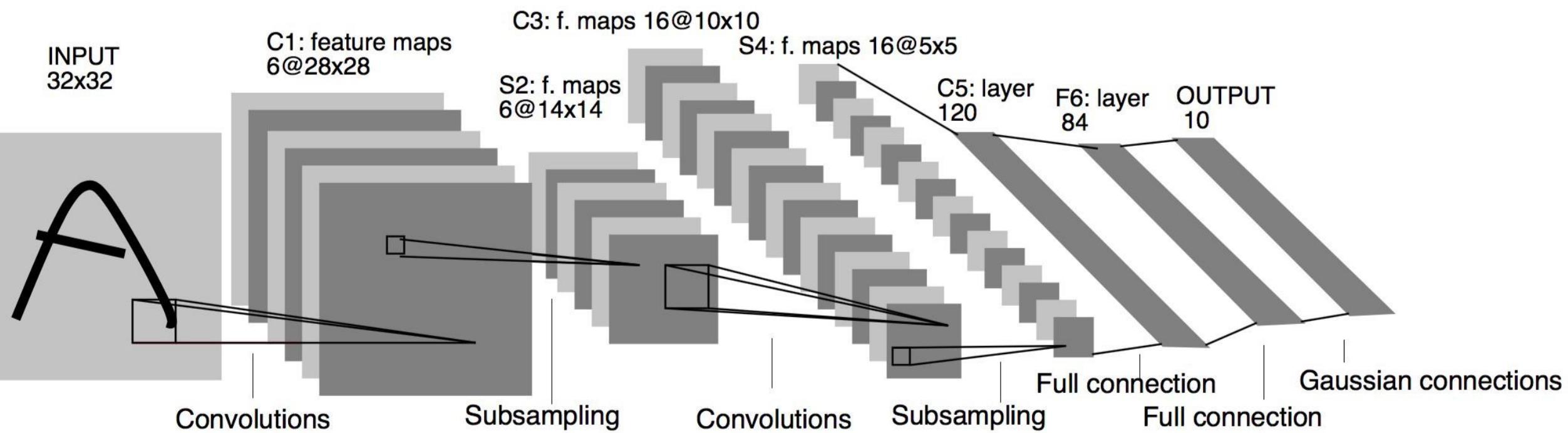
Feedforward



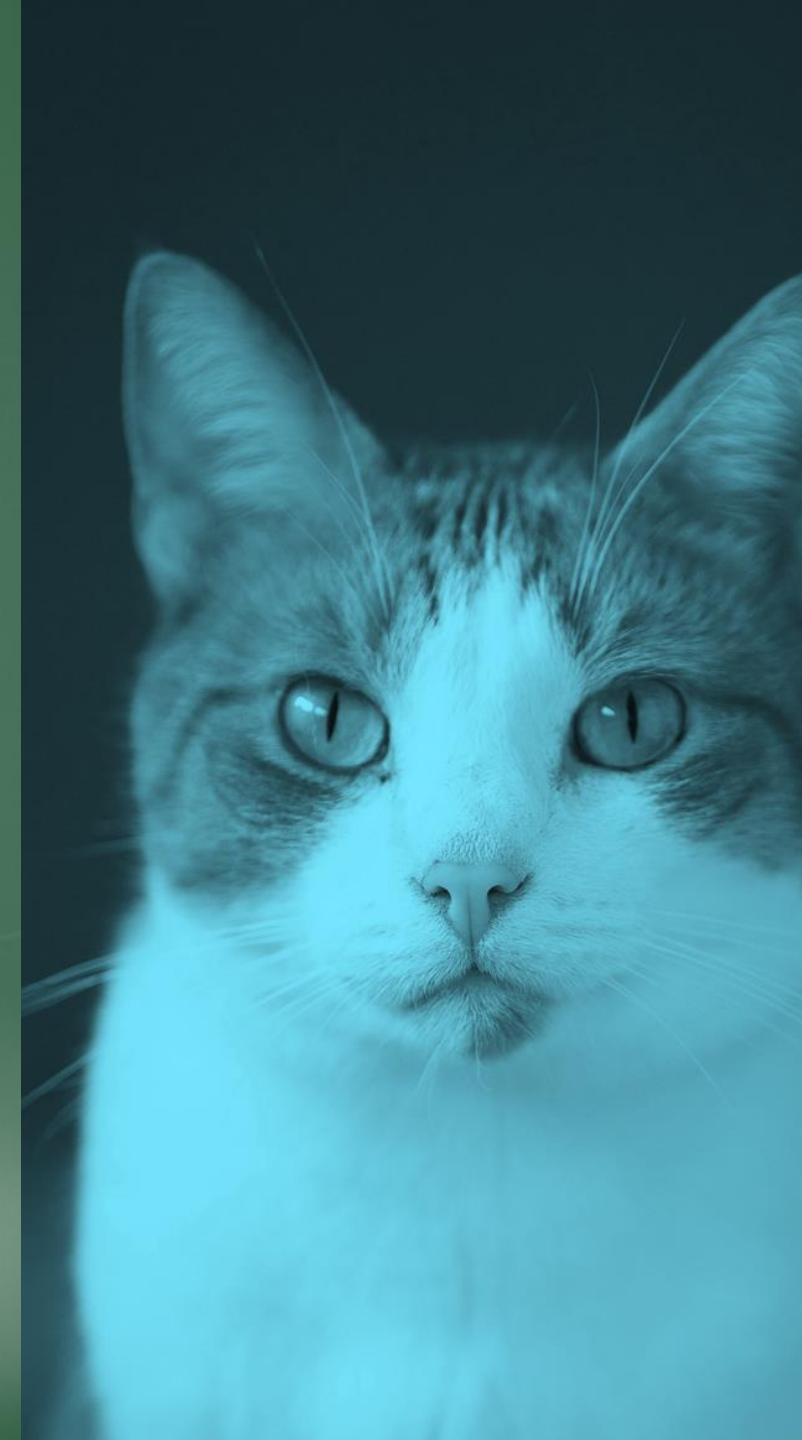
BACKPROPAGATION

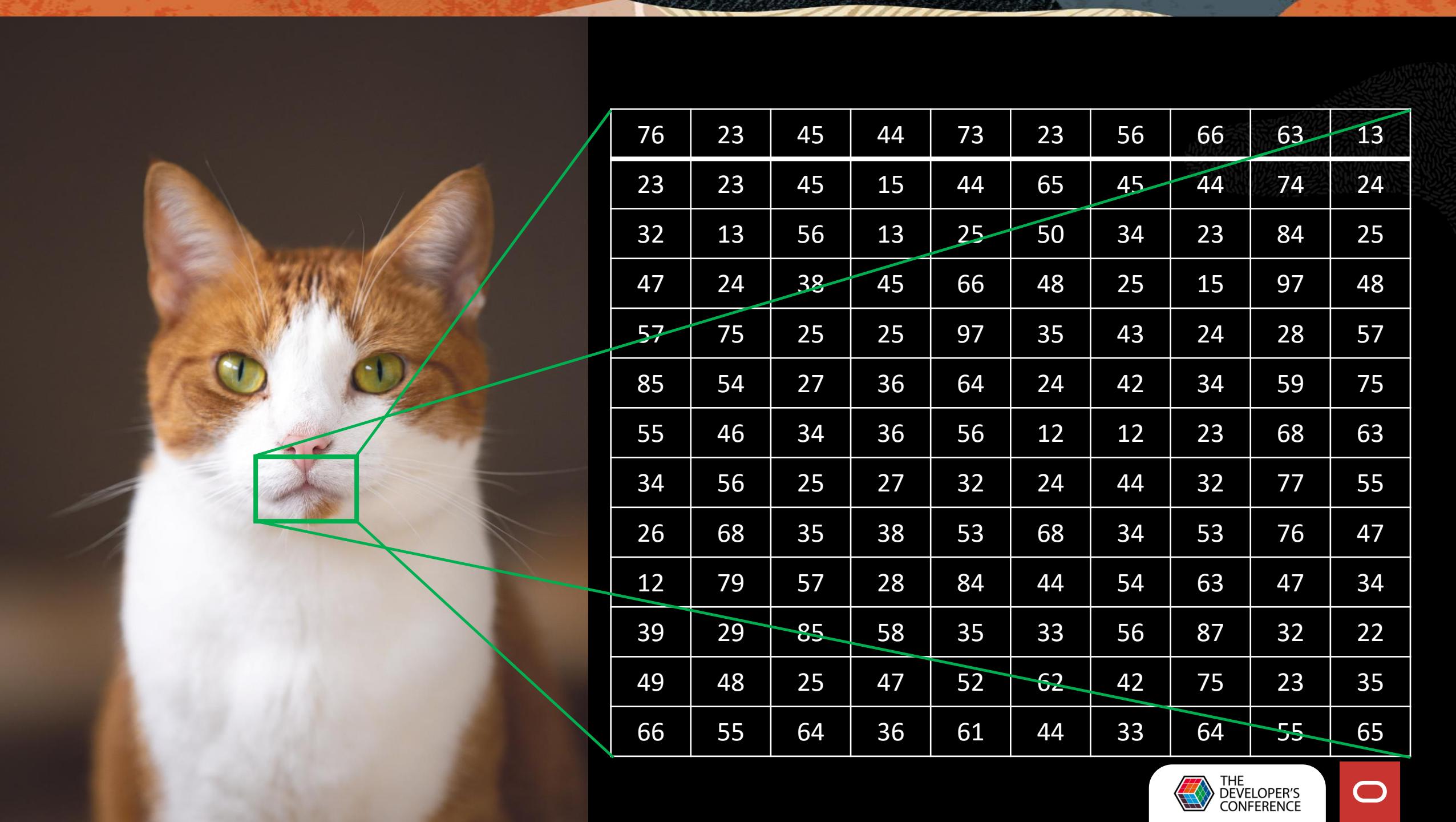


Rede Neural Convolucional

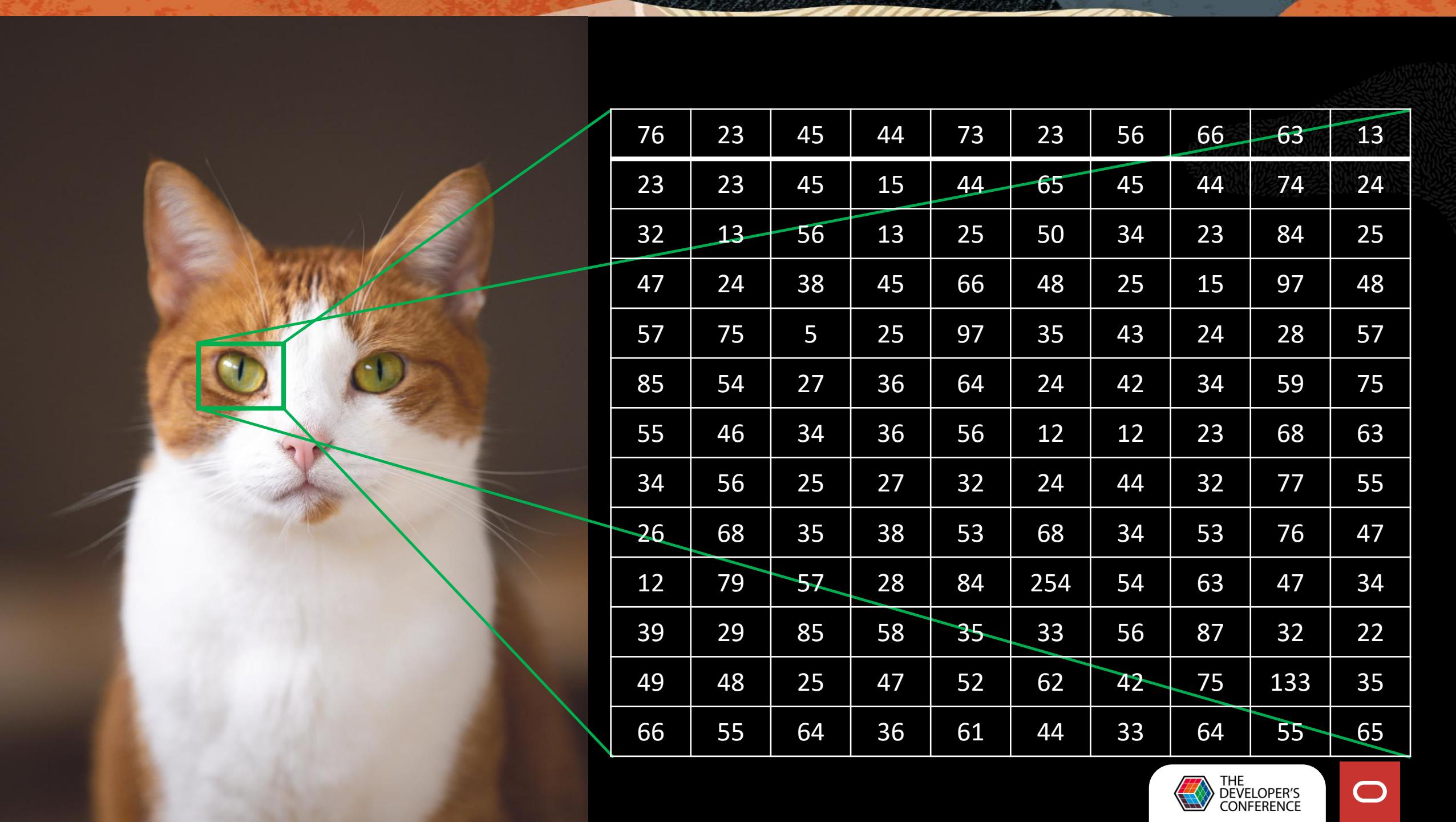




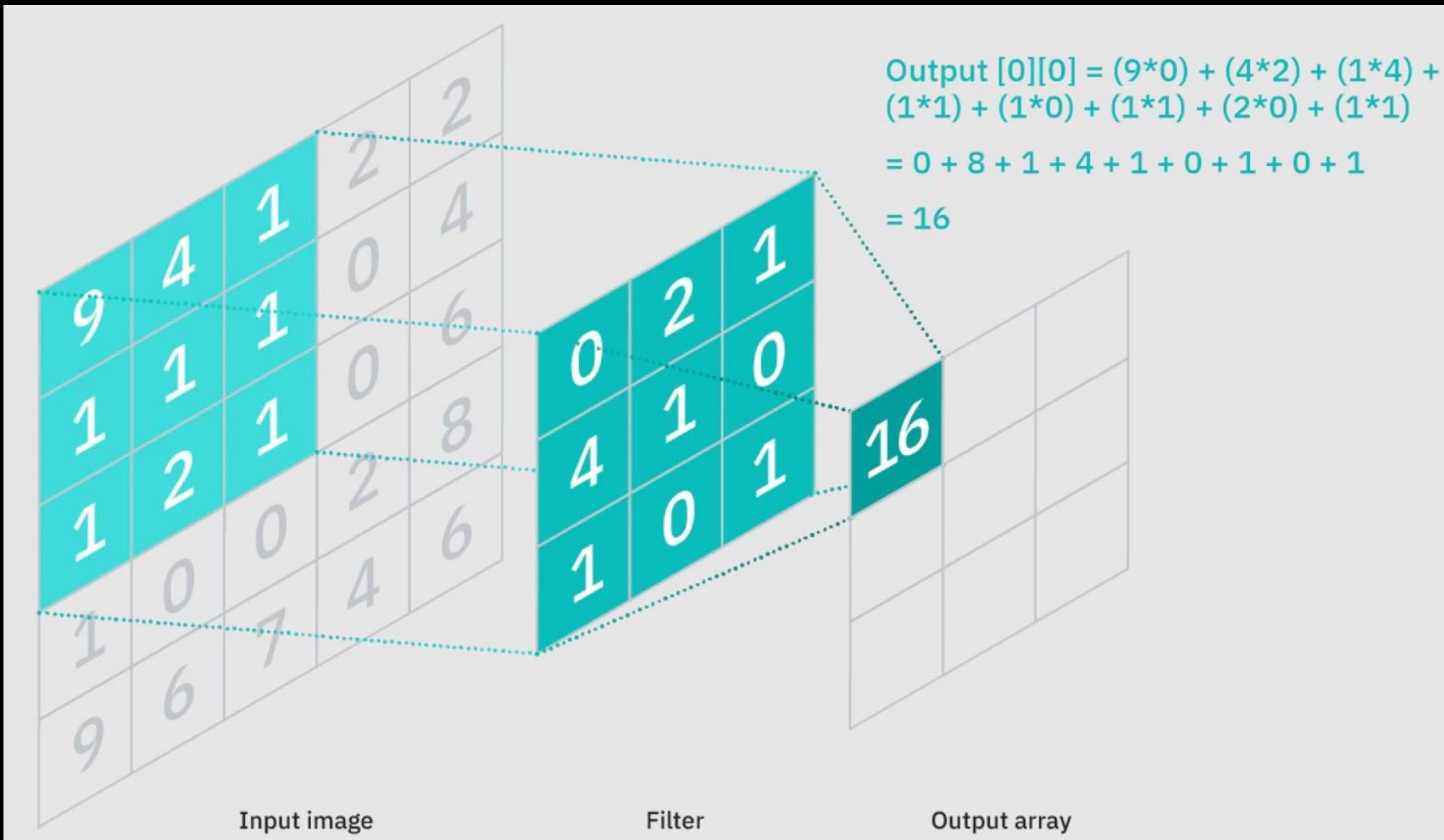


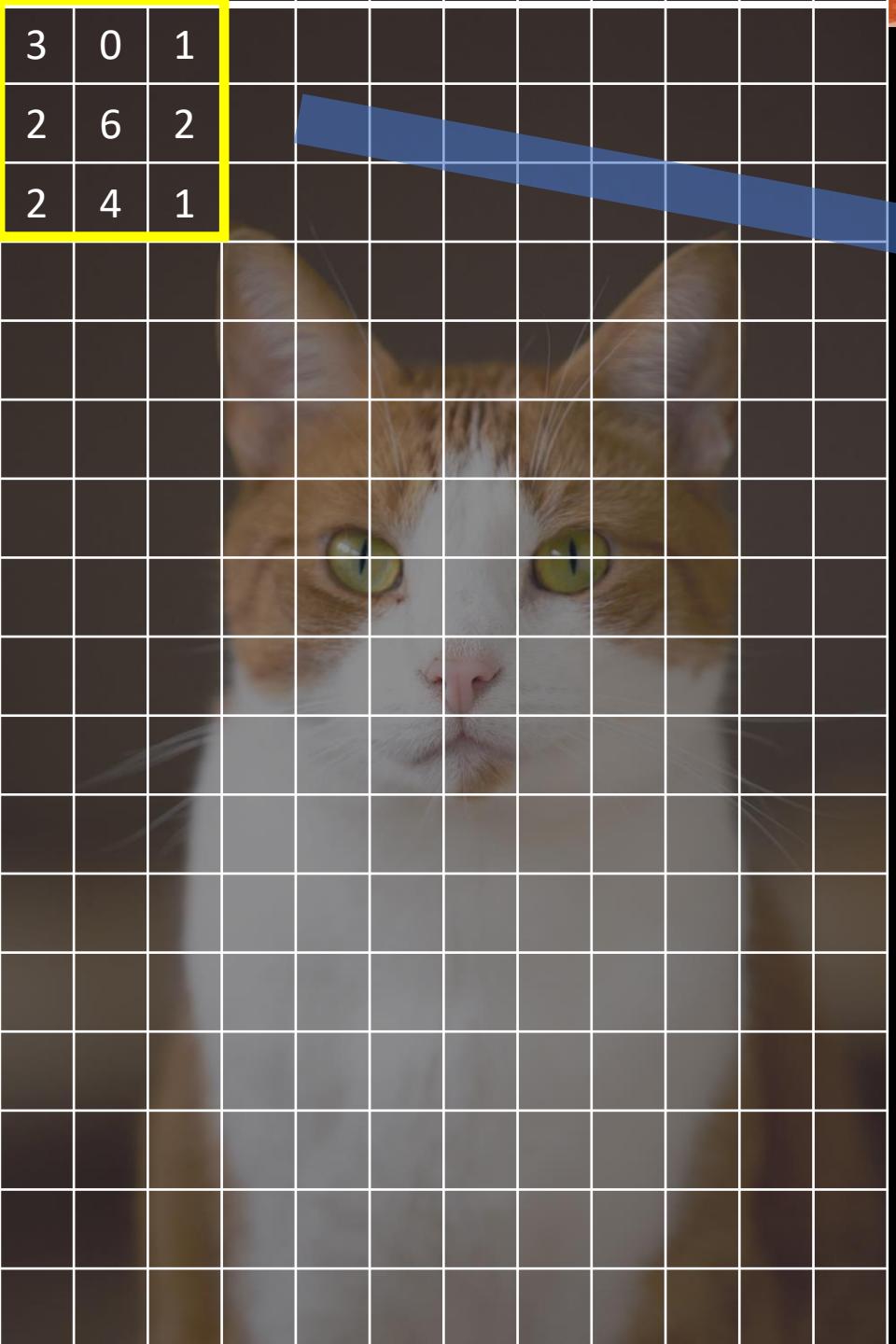


76	23	45	44	73	23	56	66	63	13
23	23	45	15	44	65	45	44	74	24
32	13	56	13	25	50	34	23	84	25
47	24	38	45	66	48	25	15	97	48
57	75	25	25	97	35	43	24	28	57
85	54	27	36	64	24	42	34	59	75
55	46	34	36	56	12	12	23	68	63
34	56	25	27	32	24	44	32	77	55
26	68	35	38	53	68	34	53	76	47
12	79	57	28	84	44	54	63	47	34
39	29	85	58	35	33	56	87	32	22
49	48	25	47	52	62	42	75	23	35
66	55	64	36	61	44	33	64	55	65



76	23	45	44	73	23	56	66	63	13
23	23	45	15	44	65	45	44	74	24
32	13	56	13	25	50	34	23	84	25
47	24	38	45	66	48	25	15	97	48
57	75	5	25	97	35	43	24	28	57
85	54	27	36	64	24	42	34	59	75
55	46	34	36	56	12	12	23	68	63
34	56	25	27	32	24	44	32	77	55
26	68	35	38	53	68	34	53	76	47
12	79	57	28	84	254	54	63	47	34
39	29	85	58	35	33	56	87	32	22
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66	55	64	36	61	44	33	64	55	65



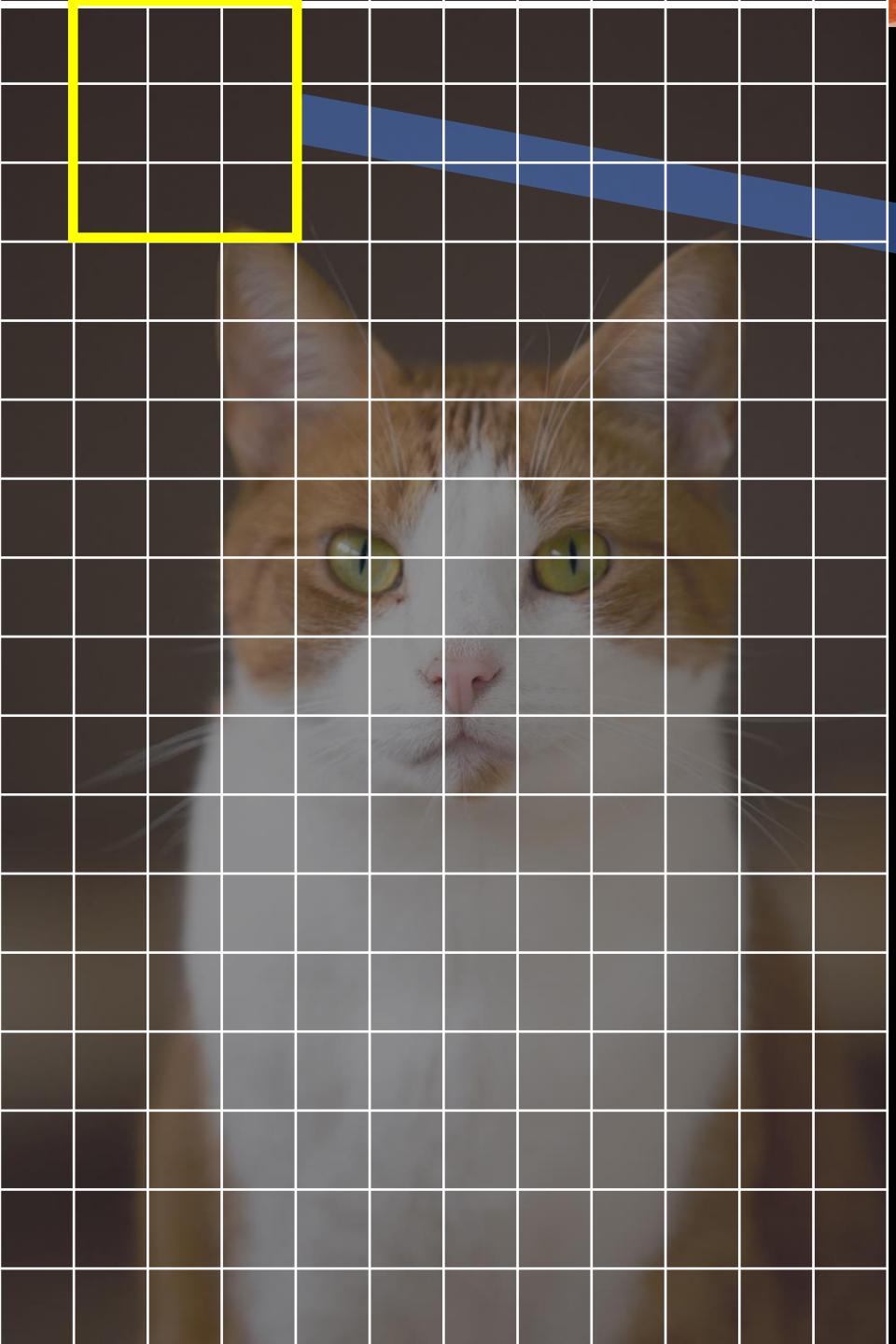


-1	0	1
-2	0	2
-1	0	1

Filtro convolucional

	-3		

Feature Map

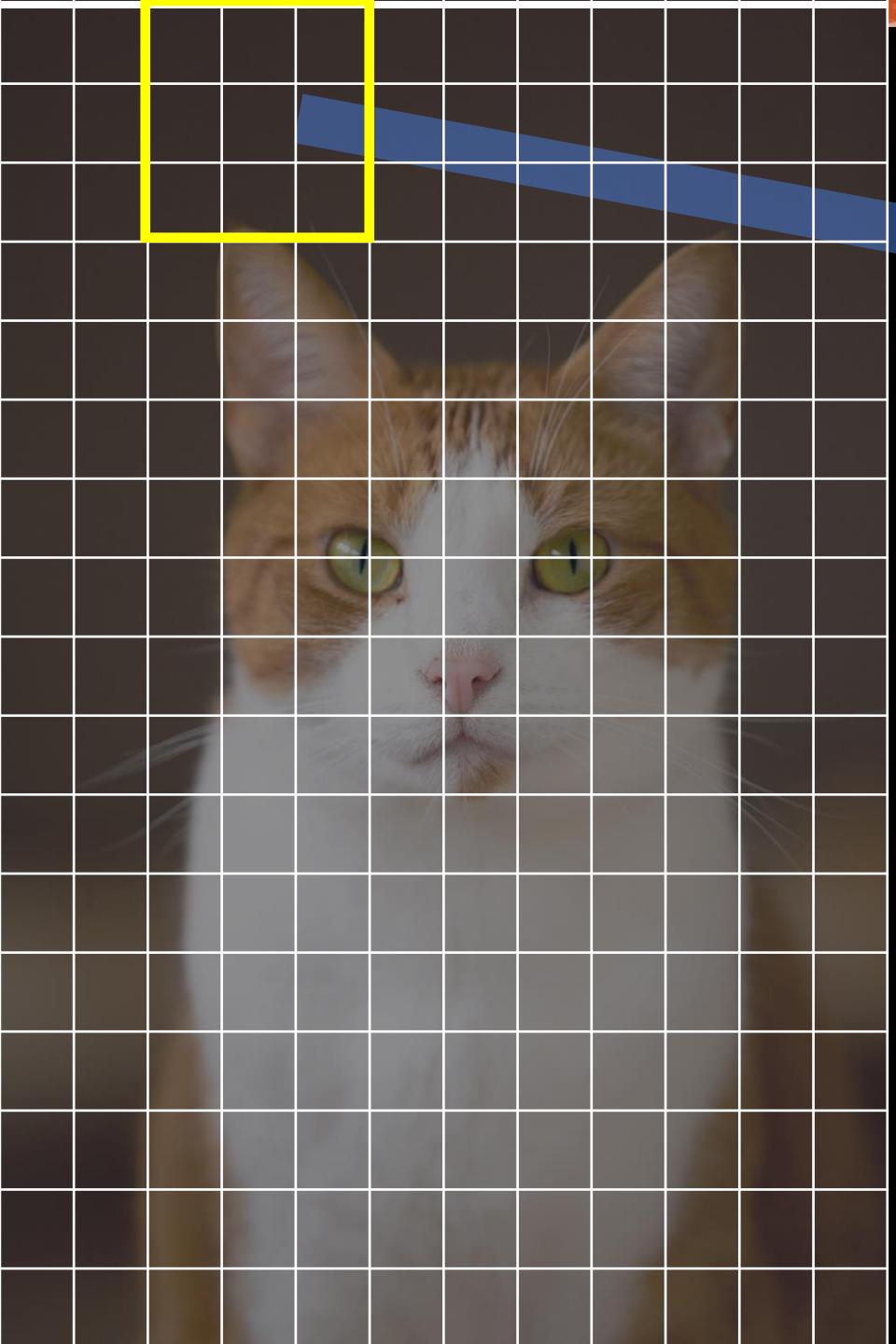


x	x	x
x	x	x
x	x	x

Filtro convolucional

x	x			

Feature Map

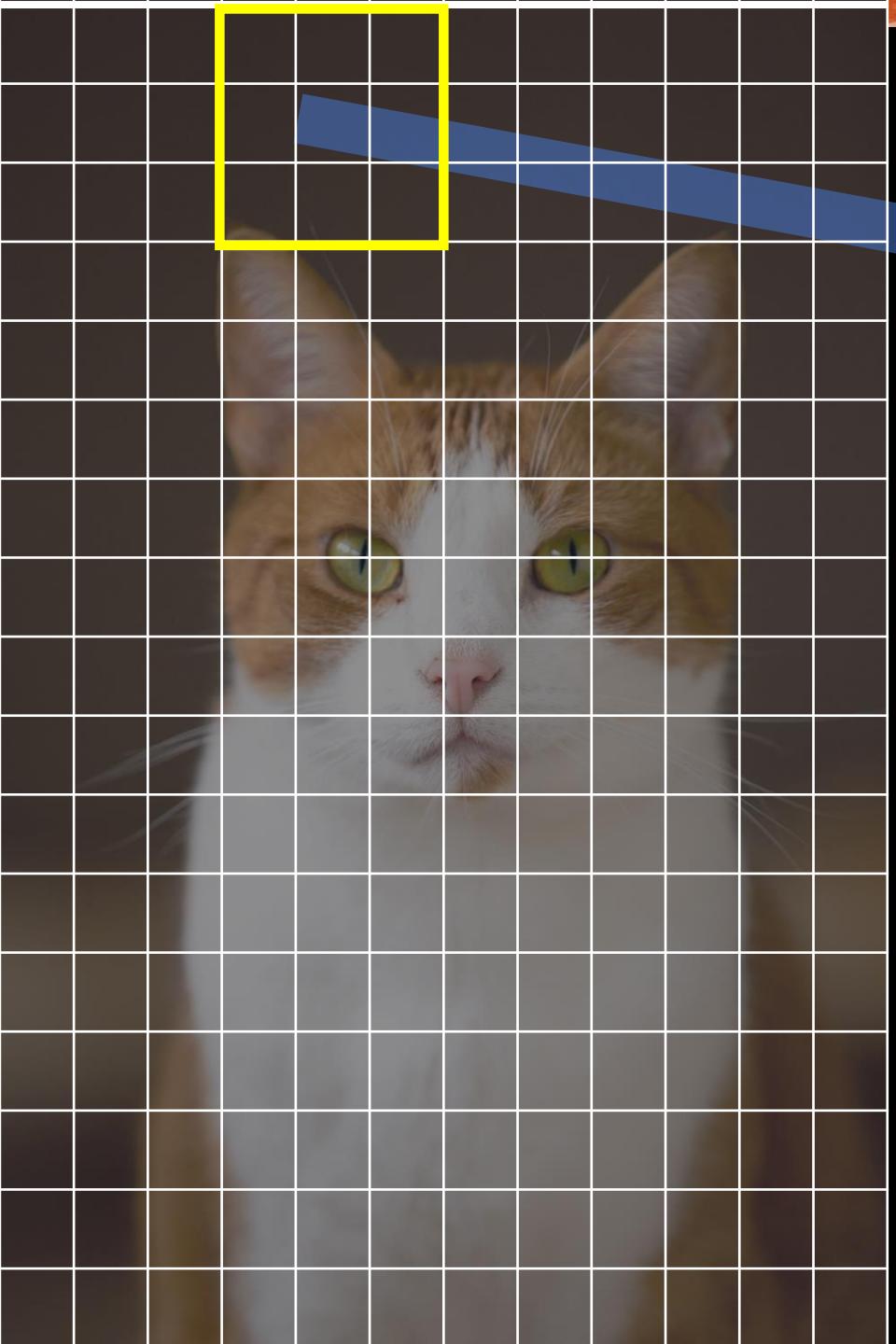


X	X	X
X	X	X
X	X	X

Filtro convolucional

X	X	X		

Feature Map

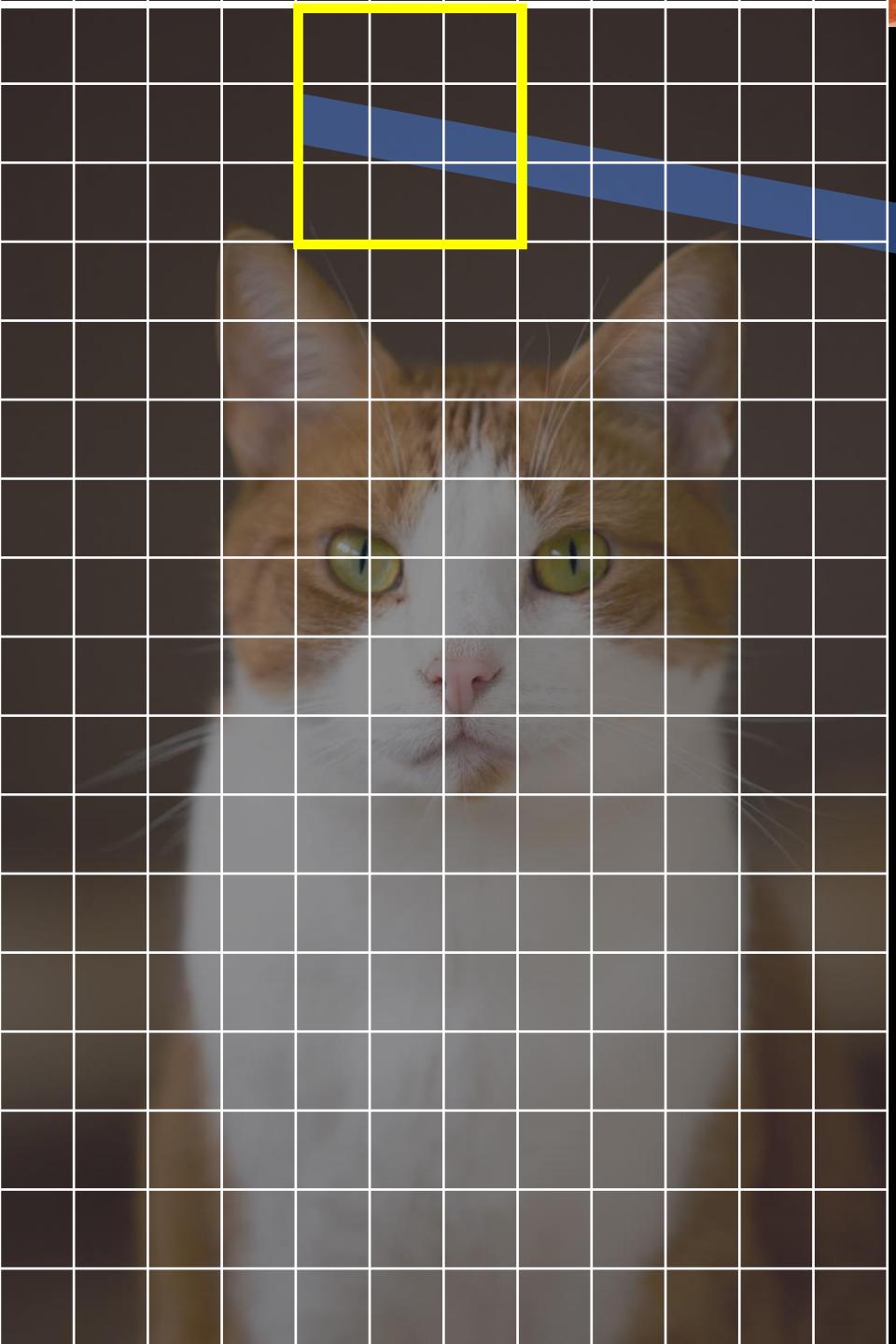


X	X	X
X	X	X
X	X	X

Filtro convolucional

X	X	X	X	

Feature Map

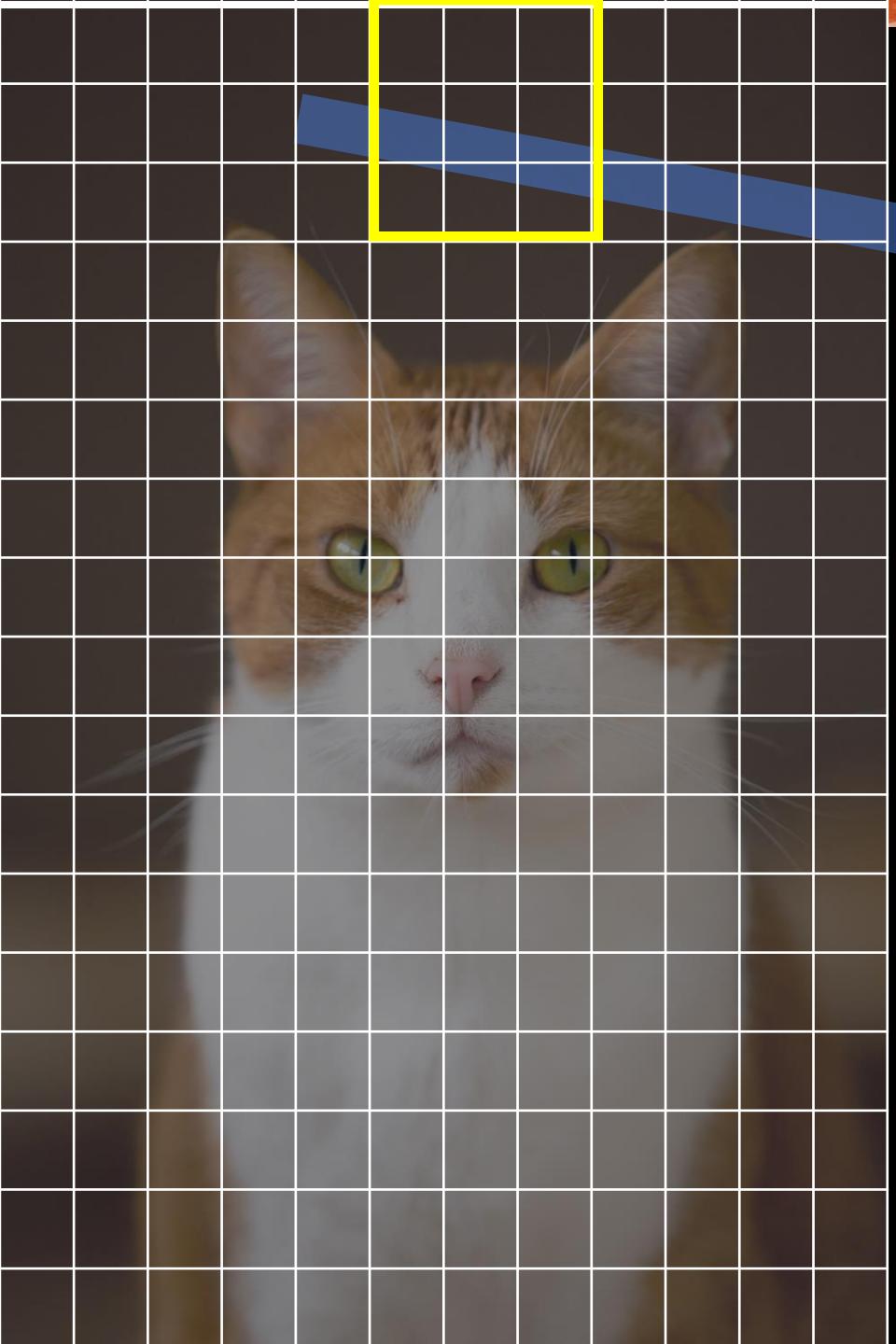


X	X	X
X	X	X
X	X	X

Filtro convolucional

X	X	X	X	X	

Feature Map

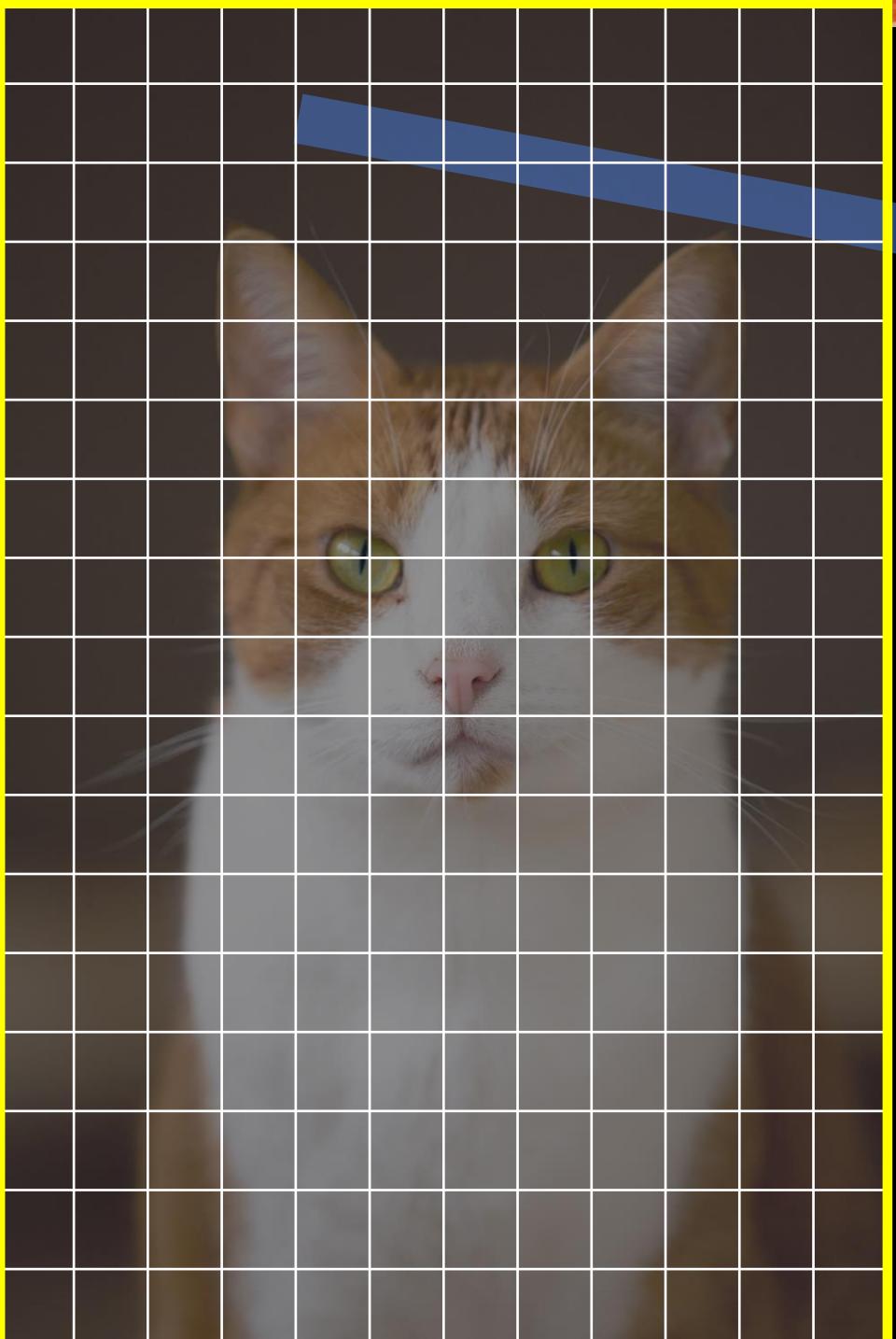


X	X	X
X	X	X
X	X	X

Filtro convolucional

X	X	X	X	X	X

Feature Map

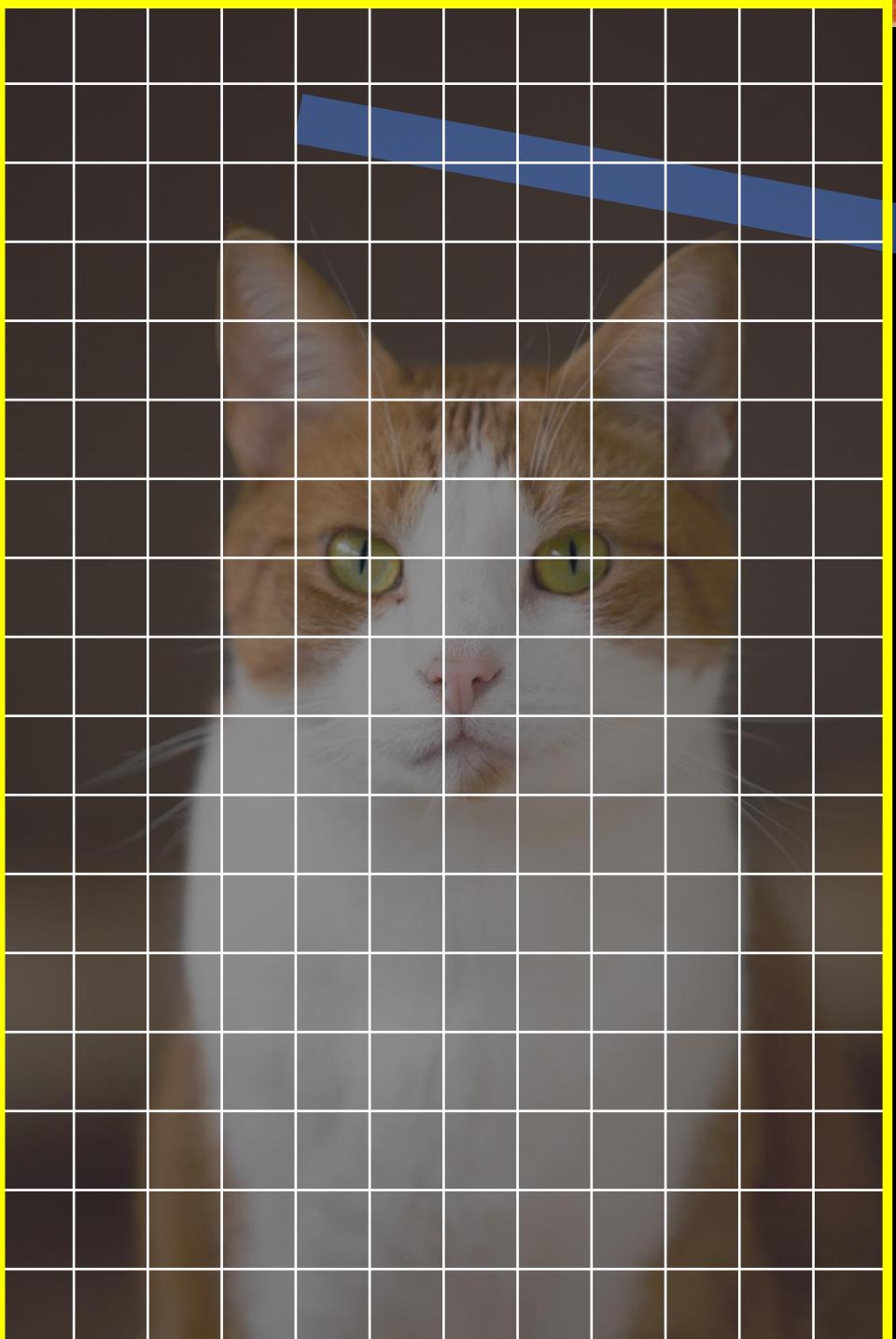


x	x	x
x	x	x
x	x	x

Filtro convolucional

x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x

Feature Map



x	x	x
x	x	x
x	x	x

Filtro convolucional

x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x
x	x	x	x	x	x

Feature Map

X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X

Feature Map

maxpooling



X	X	X	X	X
X	X	X	X	X
X	X	X	X	X
X	X	X	X	X

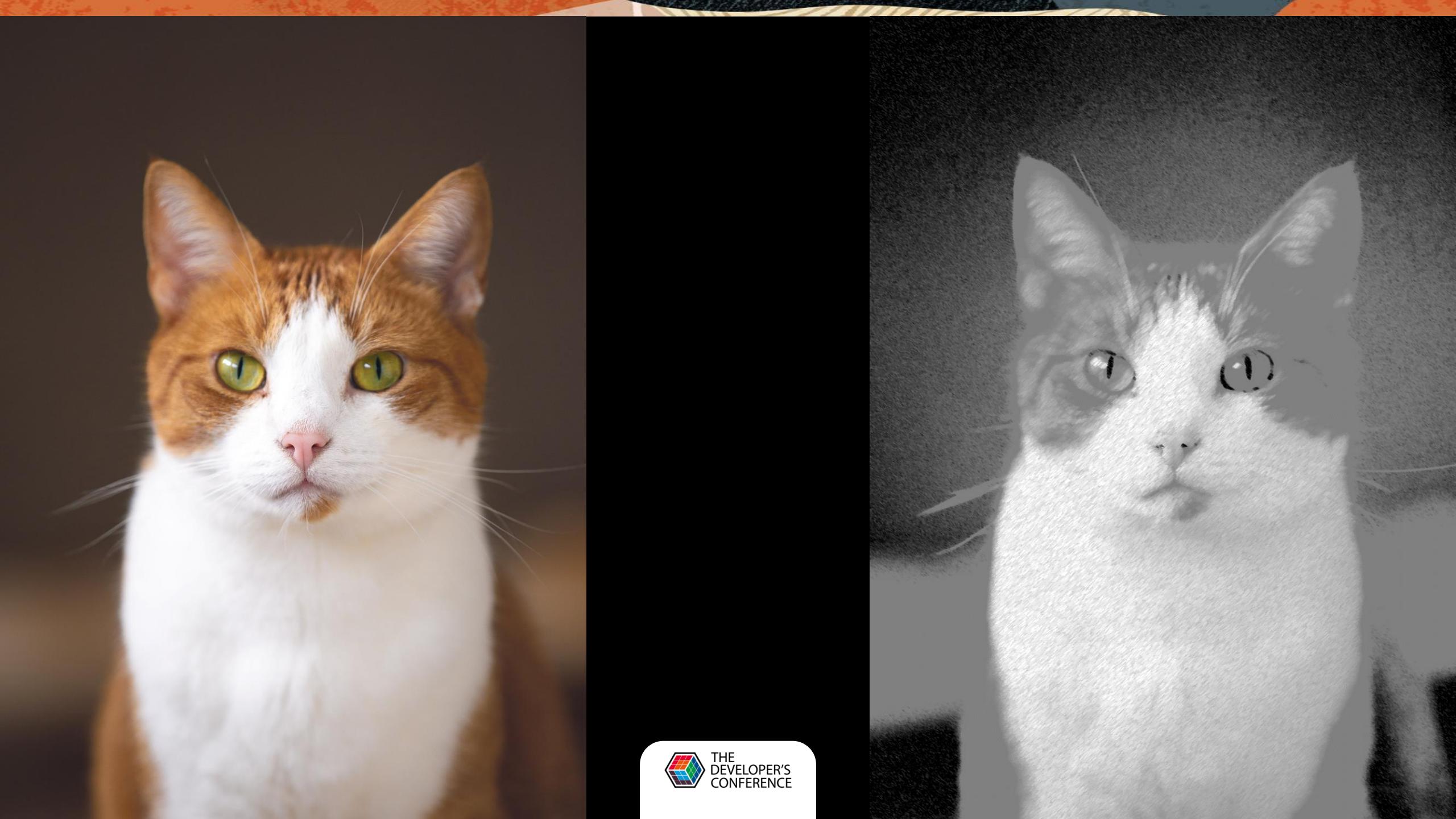
0	1	0	0	0
1	4	2	0	0
1	1	2	2	4
1	2	0	0	0

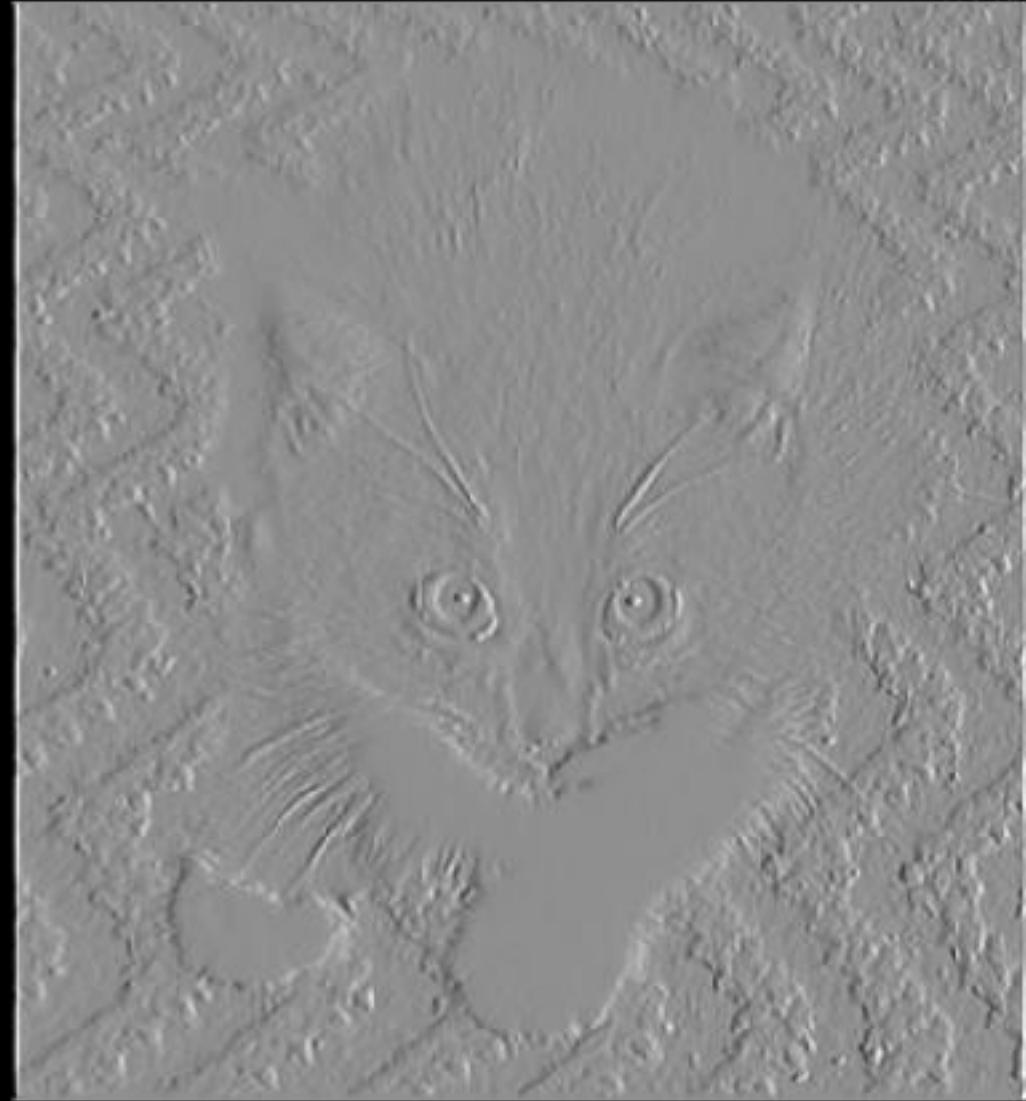
Pooled Feature Map

Flattening



0
1
0
0
0
1
4
2
0
0
1
1







(a)

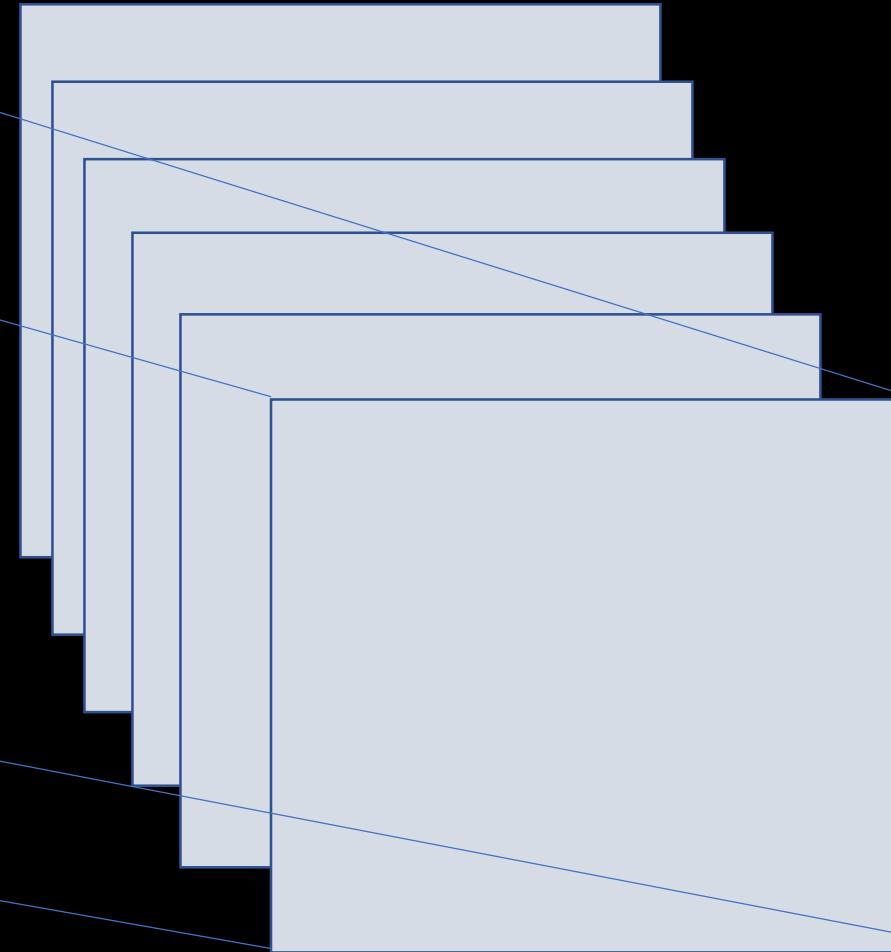


(b)



(c)

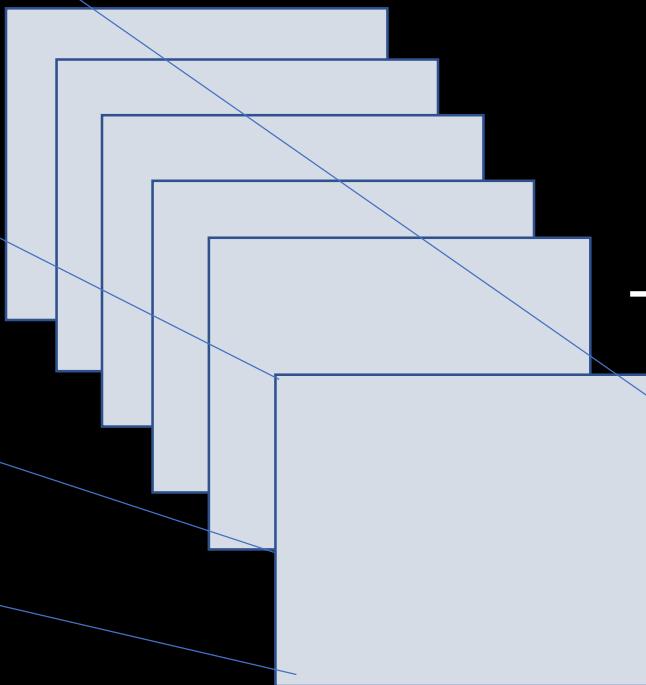
1	0	0	0	0	1	0
1	0	0	1	1	0	0
1	1	0	0	0	0	0
0	0	0	1	1	1	1
0	1	0	1	1	1	1
0	0	0	0	1	0	1
1	0	0	0	0	0	0



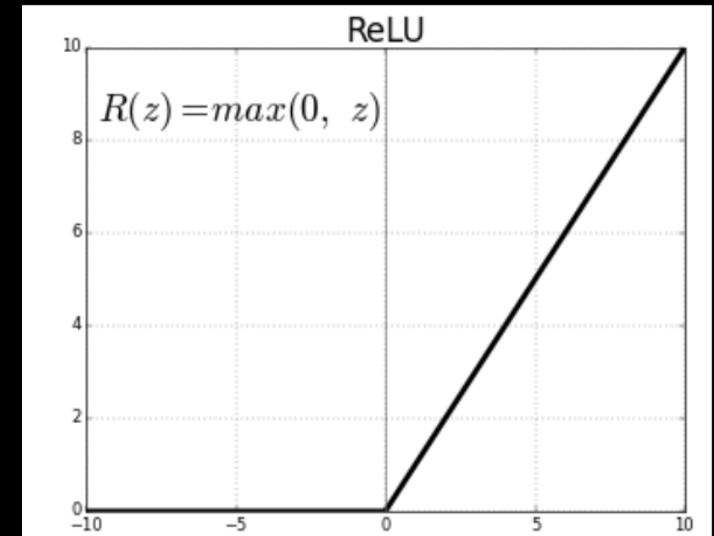
Camada Convolucional

<https://playground.tensorflow.org>

1	0	0	0	0	1	0
1	0	0	1	1	0	0
1	1	0	0	0	0	0
0	0	0	1	1	1	1
0	1	0	1	1	1	1
0	0	0	0	1	0	1
1	0	0	0	0	0	0



FUNÇÃO DE ATIVAÇÃO



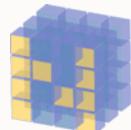
Oracle Data Science

Oracle Data Science



PyTorch

K Keras



NumPy



ANACONDA®

pandas

ATOM

scikit
learn

SPYDER
The Scientific Python Development Environment

seaborn



Oracle Cloud Infrastructure VMs for Data Science

Pre-configured

Automated install, update of Linux, supplied packages and Nvidia drivers.

Any open source library, tool or framework

Comes with over 80 tools, libraries or frameworks. Users can update supplied project, bring their own projects or ISV licenses

Massive scale

Automated scale out provisioning of multiple VMs to enable training of models on massive data sets that require multiple VMs and GPUs



Ensuring success with Data Science



Create and validate high-quality models, faster

Productive



Work with all the data you need for better results

Flexible



Deliver trusted AI for applications

Trusted

Create and validate high-quality models, faster

Make every data scientist more productive

- Automated predictive feature selection
- AutoML automated algorithm selection, tuning
- Model evaluation
- Model explanation



Tools



Languages



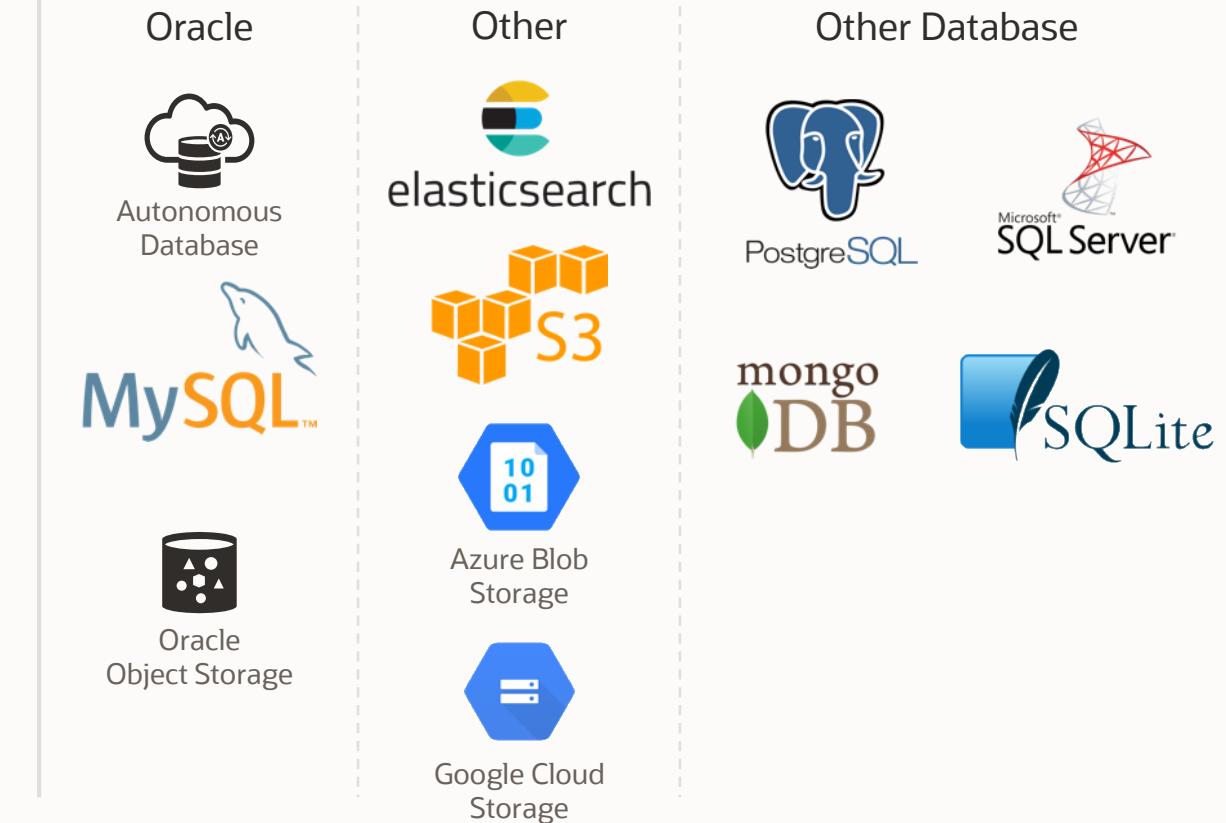
Frameworks



Work with all the data you need for better results

Needed data is never all in one place

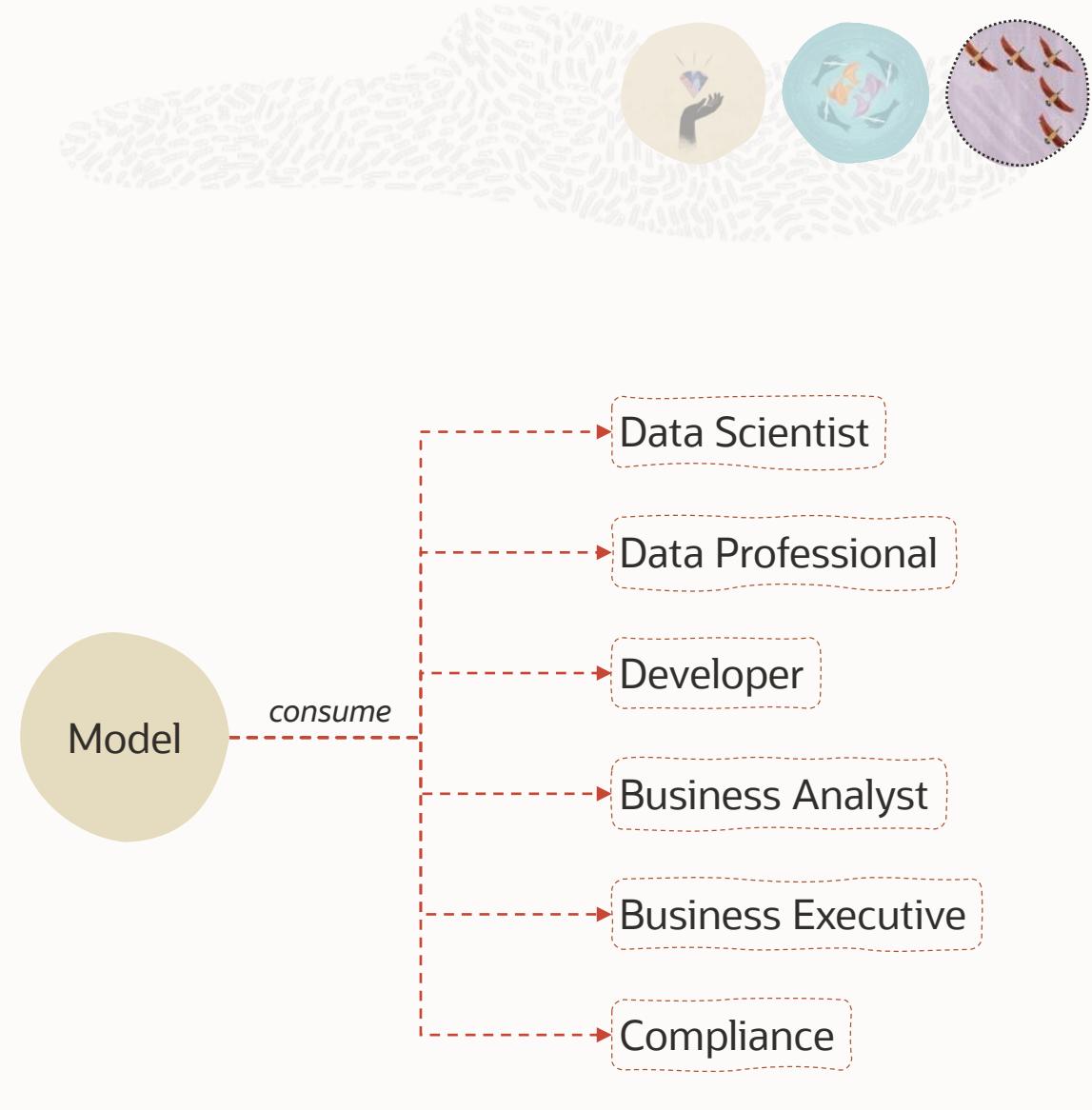
- Location of data
 - Oracle cloud
 - Other clouds
 - On-premises
- Type of data
 - Existing enterprise data
 - SaaS apps
 - Third party data



Deliver trusted AI for application

Operationalize models to ensure business change

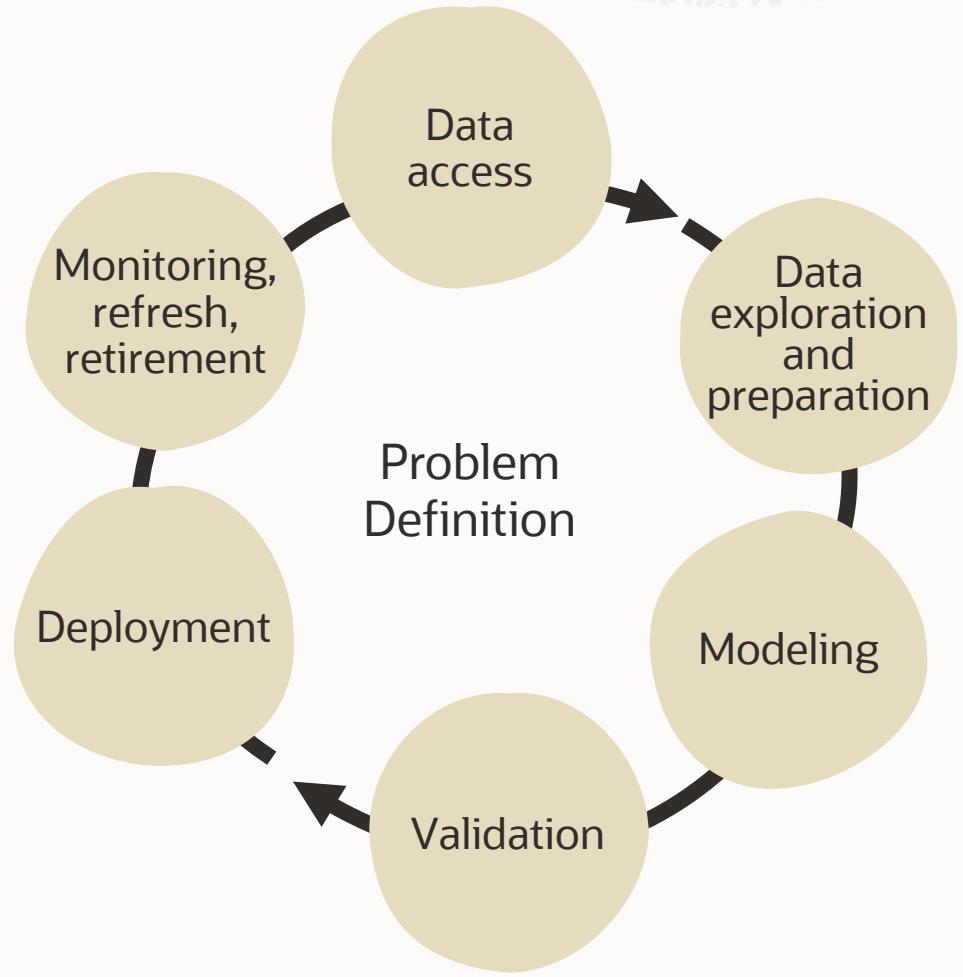
- Model deployment
 - REST API endpoint
 - Oracle Functions
 - Production databases
 - Analytics dashboards
 - Applications
- Model management
 - Storage
 - Monitoring
 - Explanation & Evaluation
 - Audit



Deliver trusted AI for applications

Ensure teams of data scientists can collaborate with each other

- Shared projects
- Model catalogs
- Team-based security policies
- Reproducibility and auditability



Oracle Cloud Infrastructure Data Science

Accelerated

Allow data scientists to work the way they want to, and provide access to automated workflows, the best of open source, and a streamlined approach to building models.

Collaborative

Enable data science teams to work together with ways to share and reproduce models in a structured, secure way for enterprise-grade results.

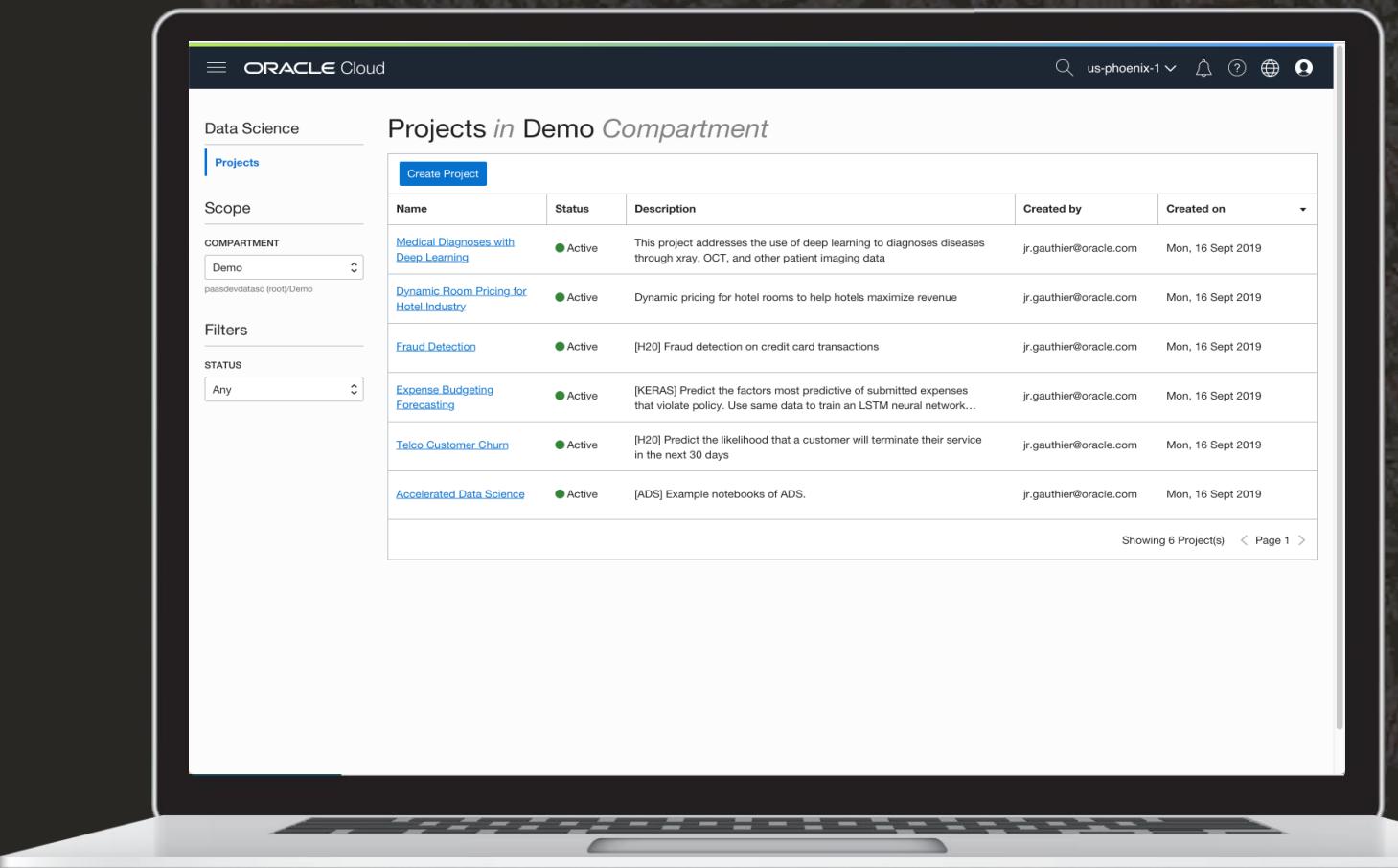
Enterprise-Grade

Provide a fully managed platform built to meet the needs of the modern enterprise



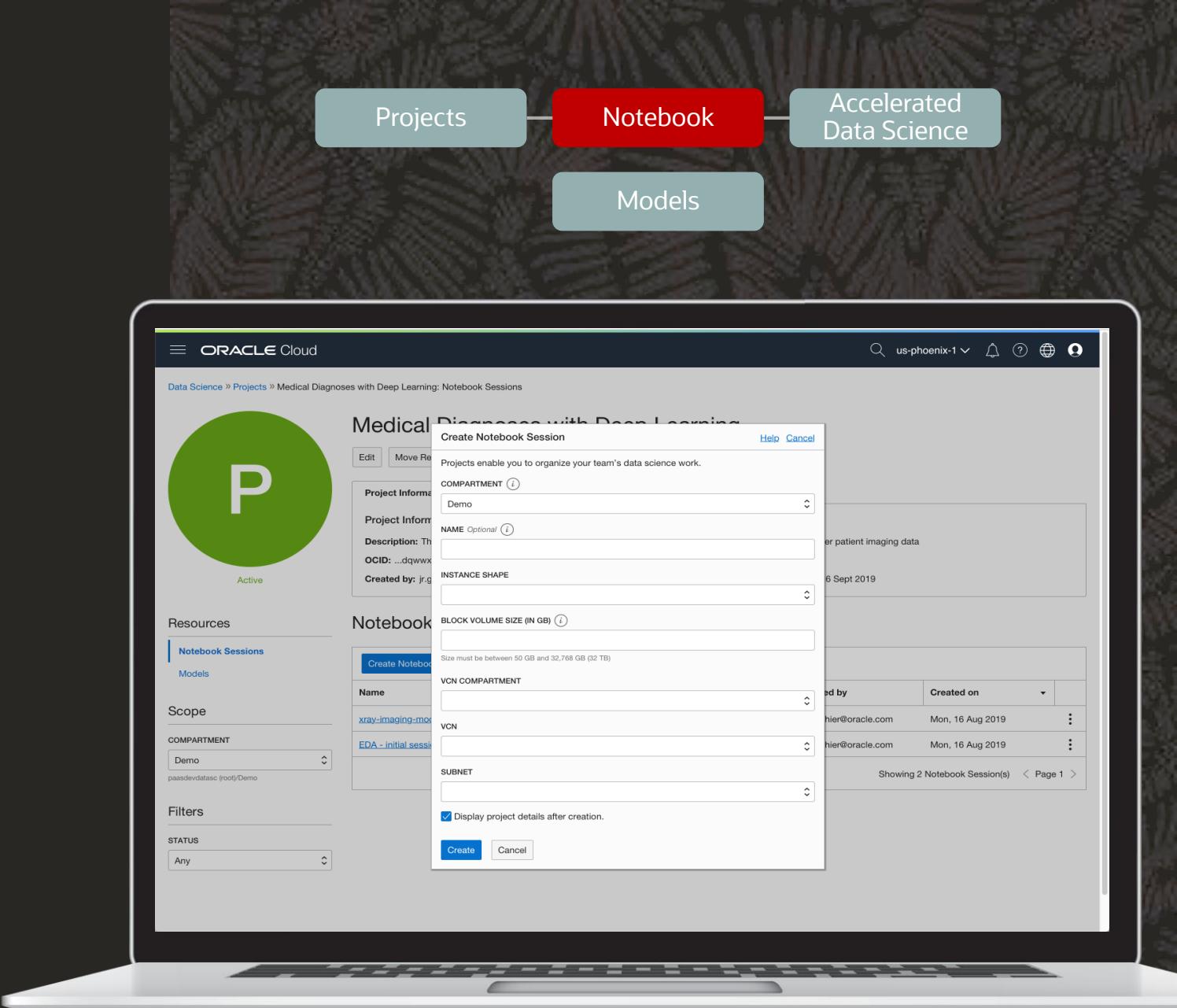
Projects to collaborate

- Describe the purpose of your work
- Organize notebook sessions and models



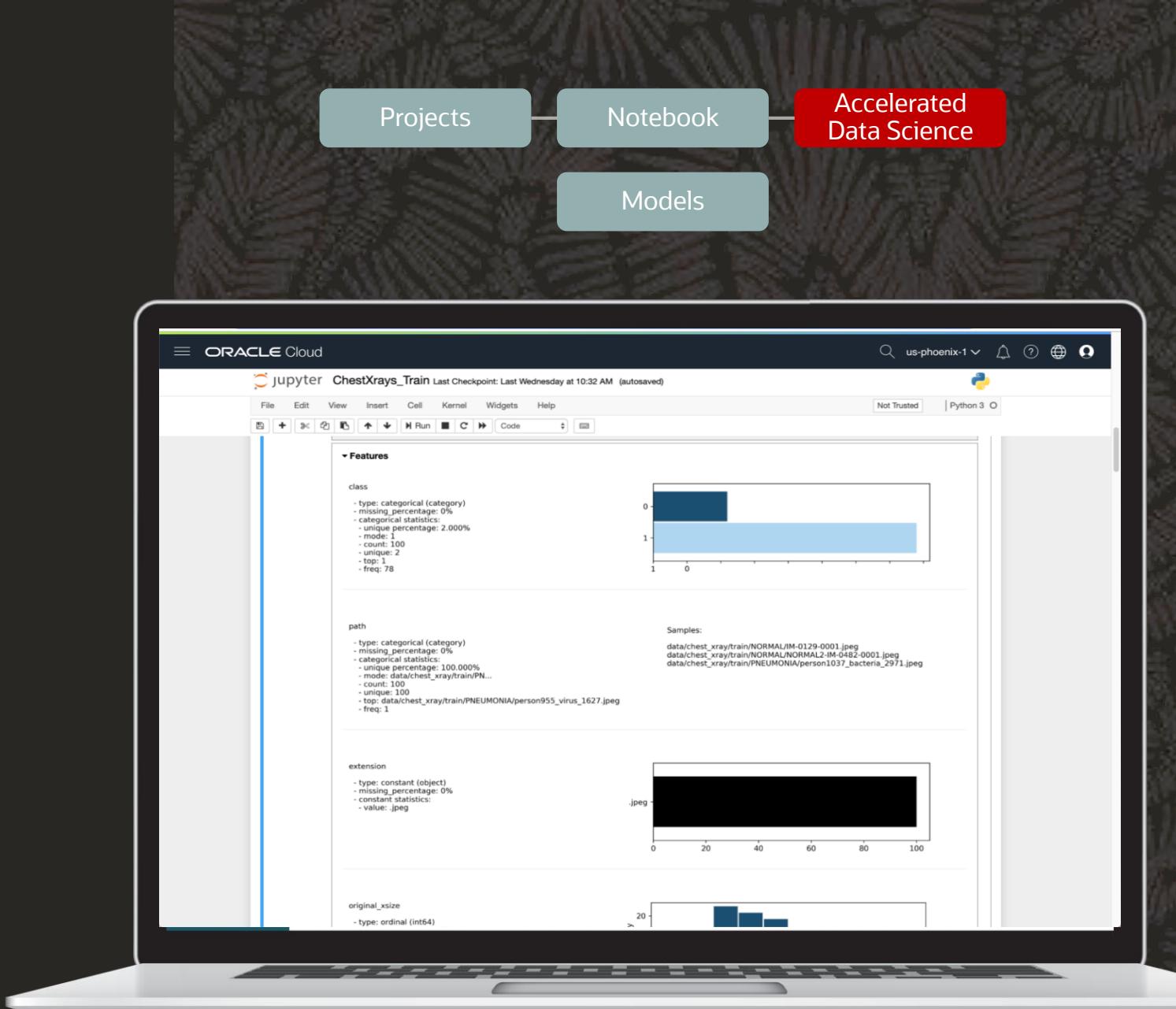
Notebook to build

- Easily launch OCI compute, storage, and networking for Python data science workloads
- JupyterLab and curated open source machine learning libraries for building and training models
- Loaded with Expertise Content and use cases
- Includes the Oracle Accelerated Data Science SDK



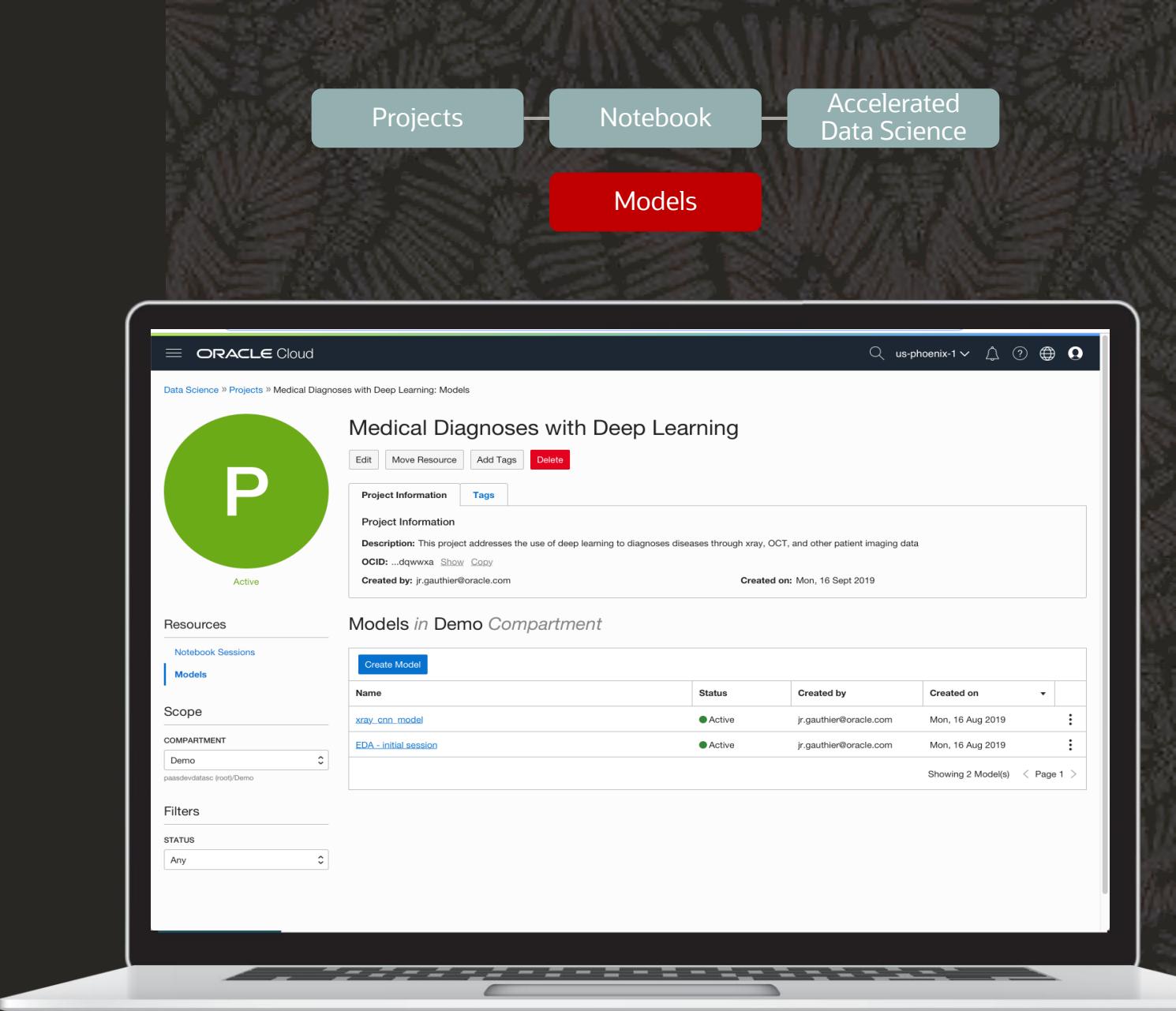
Accelerated Data Science SDK to innovate faster

- Python library to make common data science tasks faster, easier, and less error-prone
- Capabilities for data exploration and manipulation, model explanation and interpretation, and AutoML



Models to deliver business value

- Track model metadata (creator, created date, name, provenance)
- Save model artifacts in service-managed object storage
- Load models into notebook session for testing



Vamos juntos nesta trilha!



linkedin.com/groups/8984009



youtube.com/c/Inovaçãocomdadosemnuvem



anchor.fm/inova-dados-nuvem



github.com/taborda-cbip/inovacao-com-dados-em-nuvem



Inovação com dados em nuvem

MEU PROJETO DE DEEP
LEARNING COM ORACLE
DATA SCIENCE

