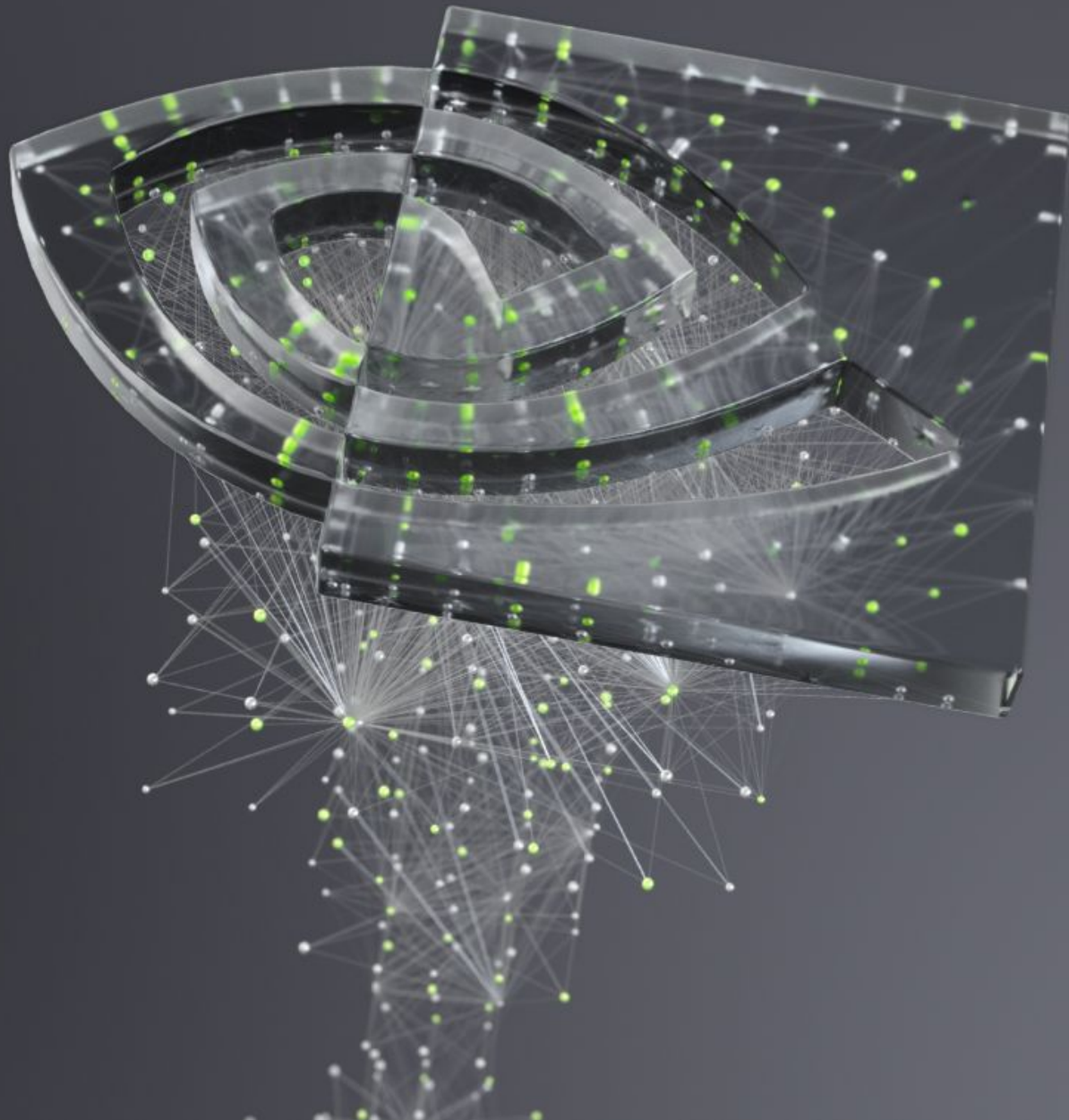




DEEP
LEARNING
INSTITUTE

FUNDAMENTALS OF DEEP LEARNING

Part 6: Advanced Architectures



AGENDA

Part 1: An Introduction to Deep Learning

Part 2: How a Neural Network Trains

Part 3: Convolutional Neural Networks

Part 4: Data Augmentation and Deployment

Part 5: Pre-trained Models

Part 6: Advanced Architectures

AGENDA – PART 6

- Moving Forward
- Natural Language Processing
- Recurrent Neural Networks
- Other Architectures
- Closing Thoughts



MOVING FORWARD

FIELDS OF AI



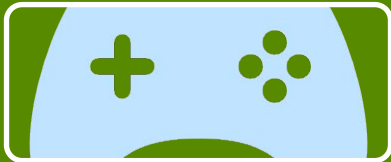
Computer Vision

- Optometry



Natural Language Processing

- Linguistics



Reinforcement Learning

- Game Theory
- Psychology



Anomaly Detection

- Security
- Medicine

FIELDS OF AI



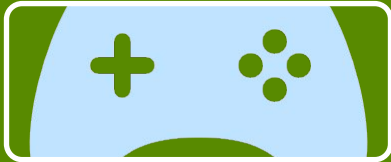
Computer Vision

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Natural Language Processing

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Anomaly Detection

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FIELDS OF AI



Computer Vision

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Reinforcement Learning

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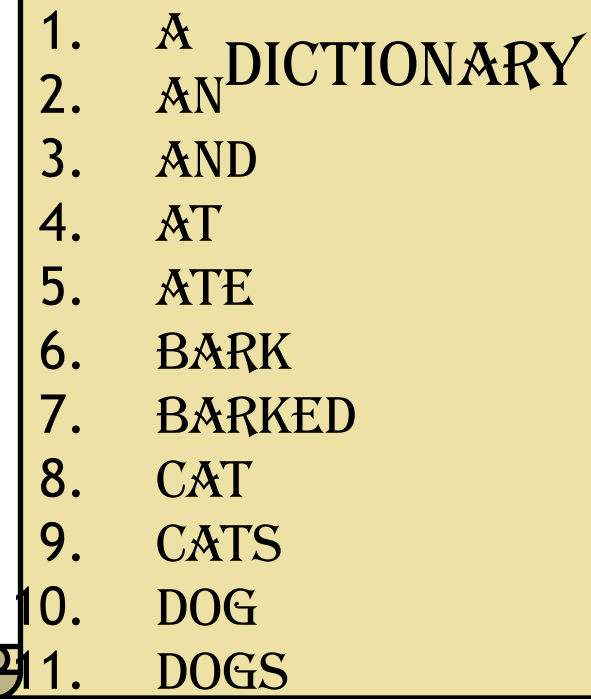


NATURAL LANGUAGE PROCESSING

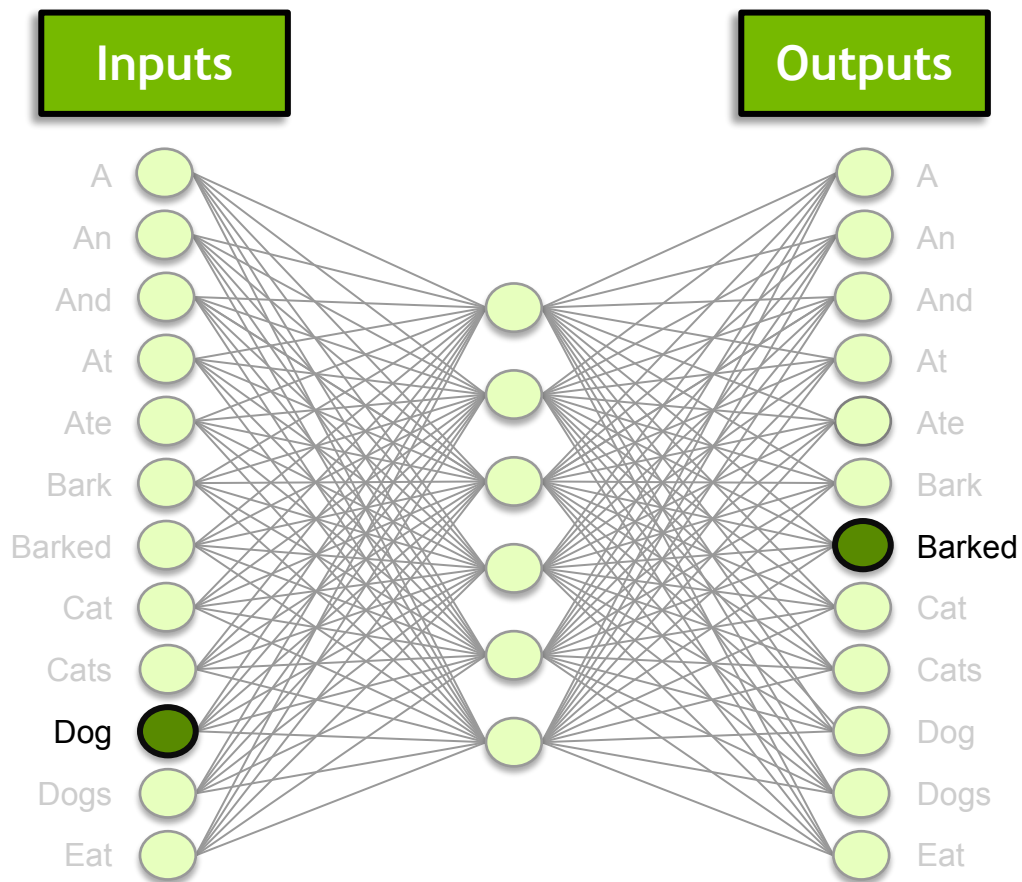
FROM WORDS TO NUMBERS

“A dog barked at a cat.”

[1, 10, 7, 4, 1, 8]

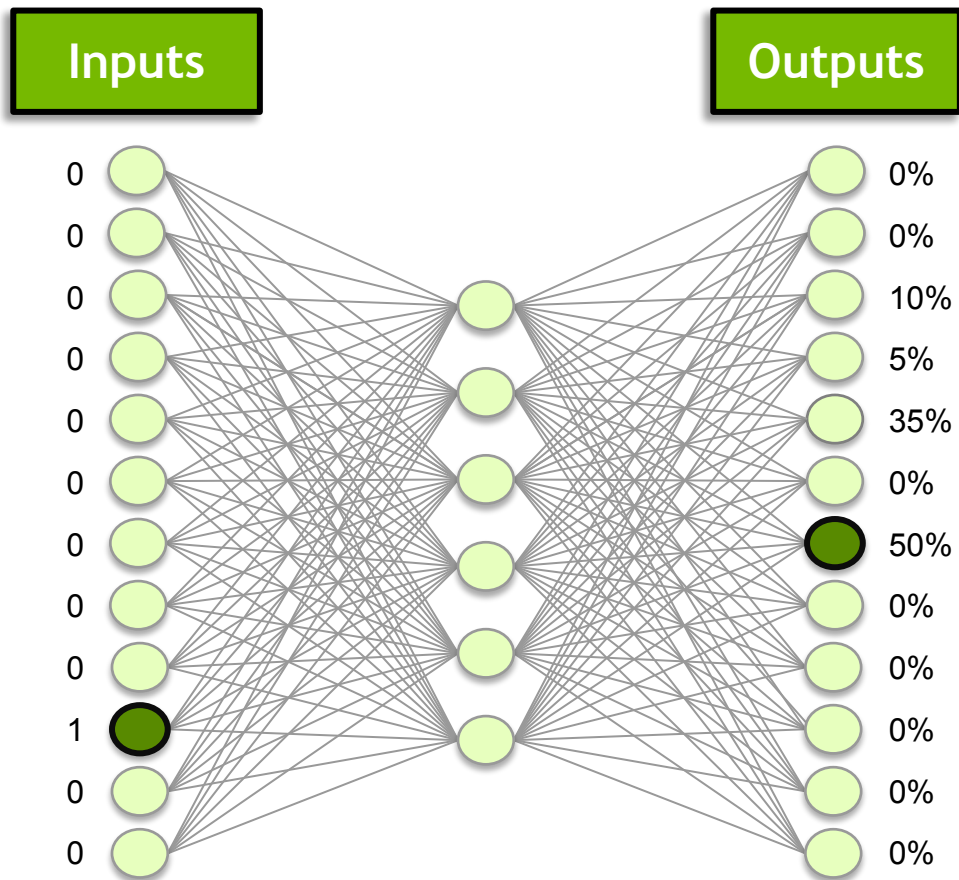
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FROM WORDS TO NUMBERS



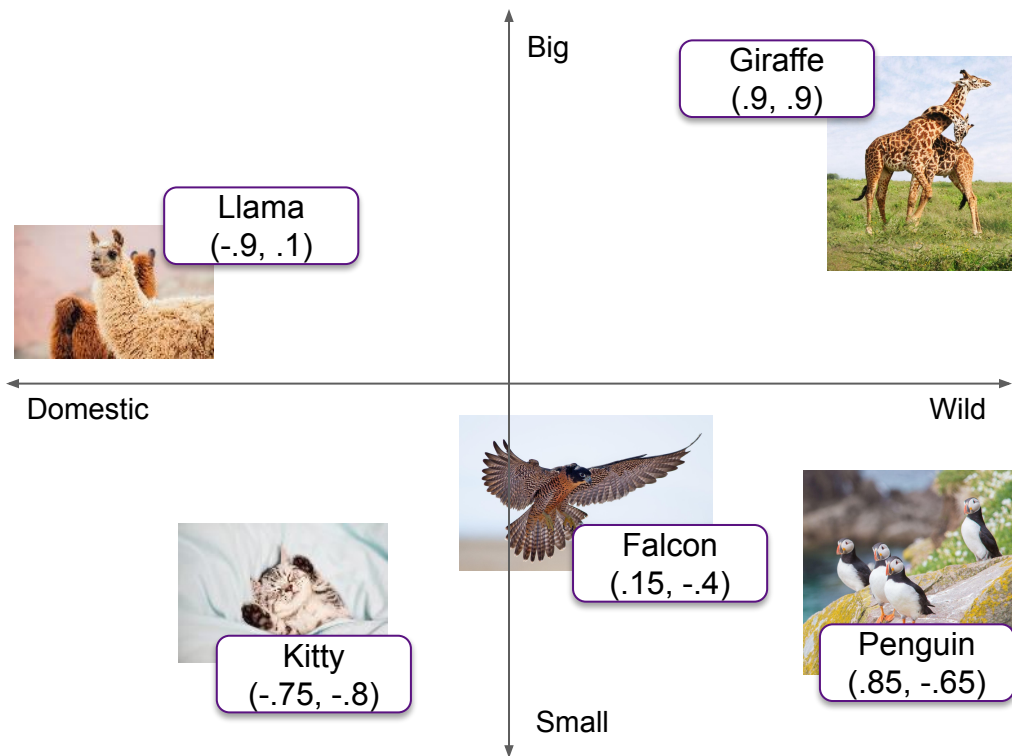
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FROM WORDS TO NUMBERS



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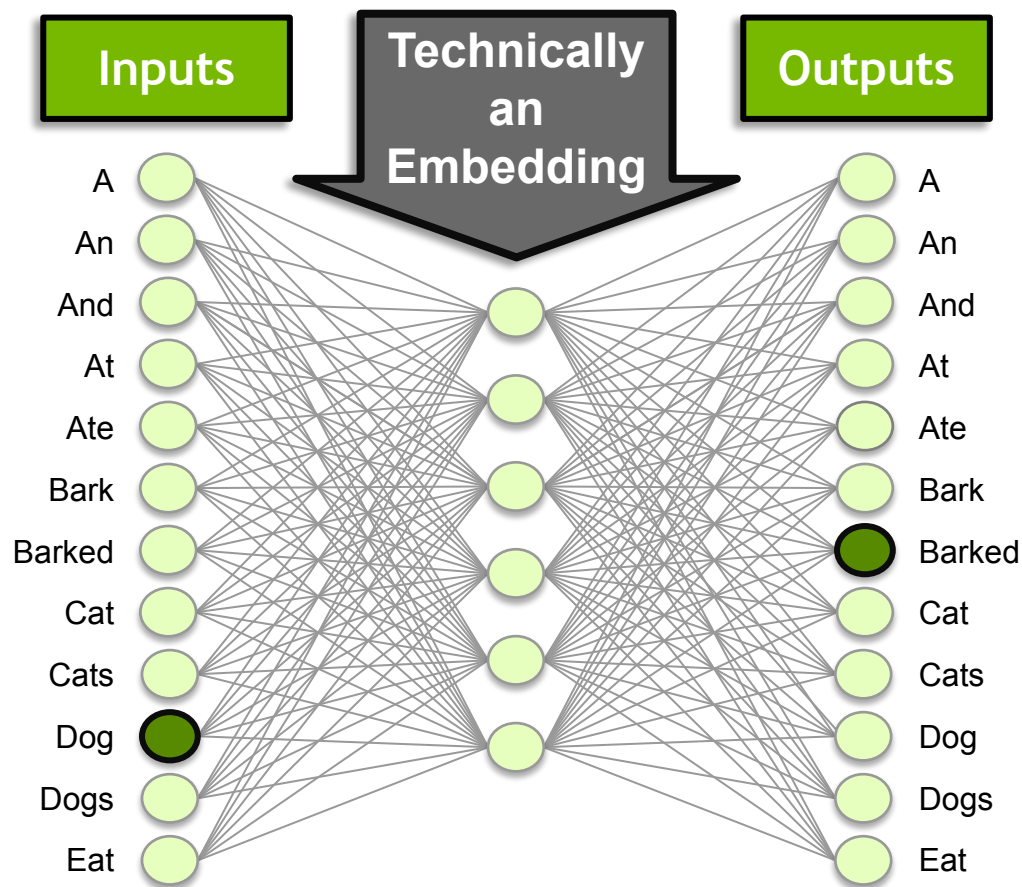
FROM WORDS TO NUMBERS



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BIGGER DICTIONARY

FROM WORDS TO NUMBERS



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RECURRENT NEURAL NETWORKS

RECURRENT NEURAL NETWORKS

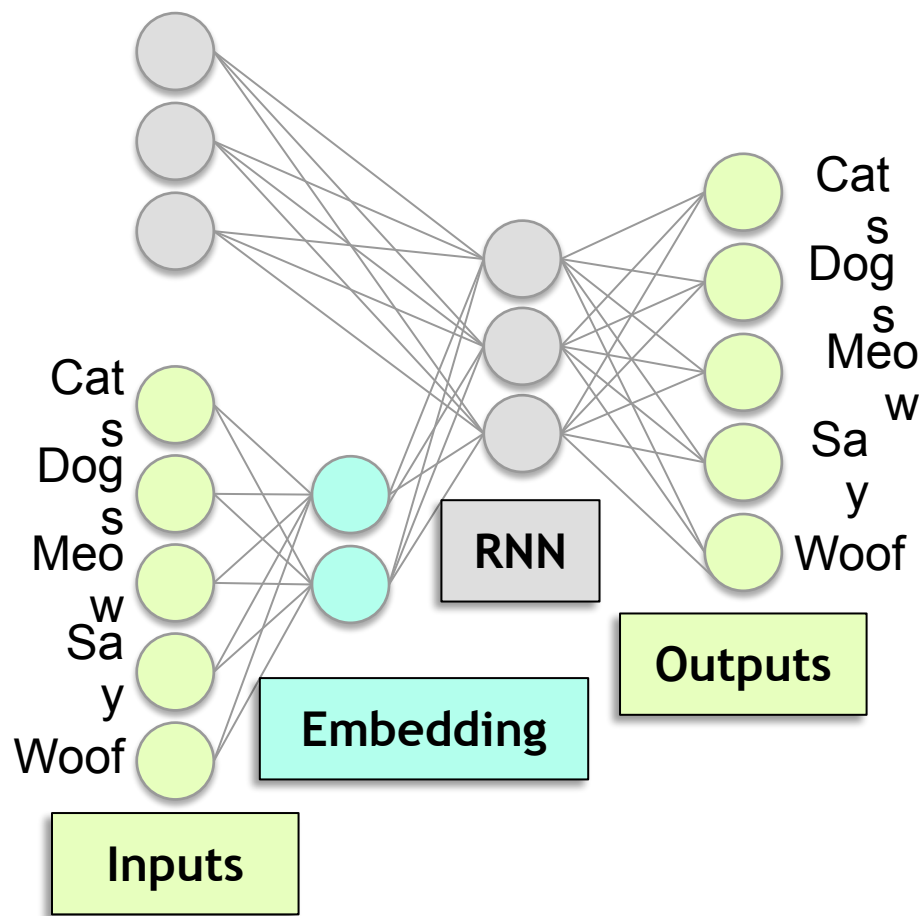
“Cats say ____.”

“Dogs say ____.”

DICTIONARY

1. CATS
2. DOGS
3. MEOW
4. SAY
5. WOOF

RECURRENT NEURAL NETWORKS



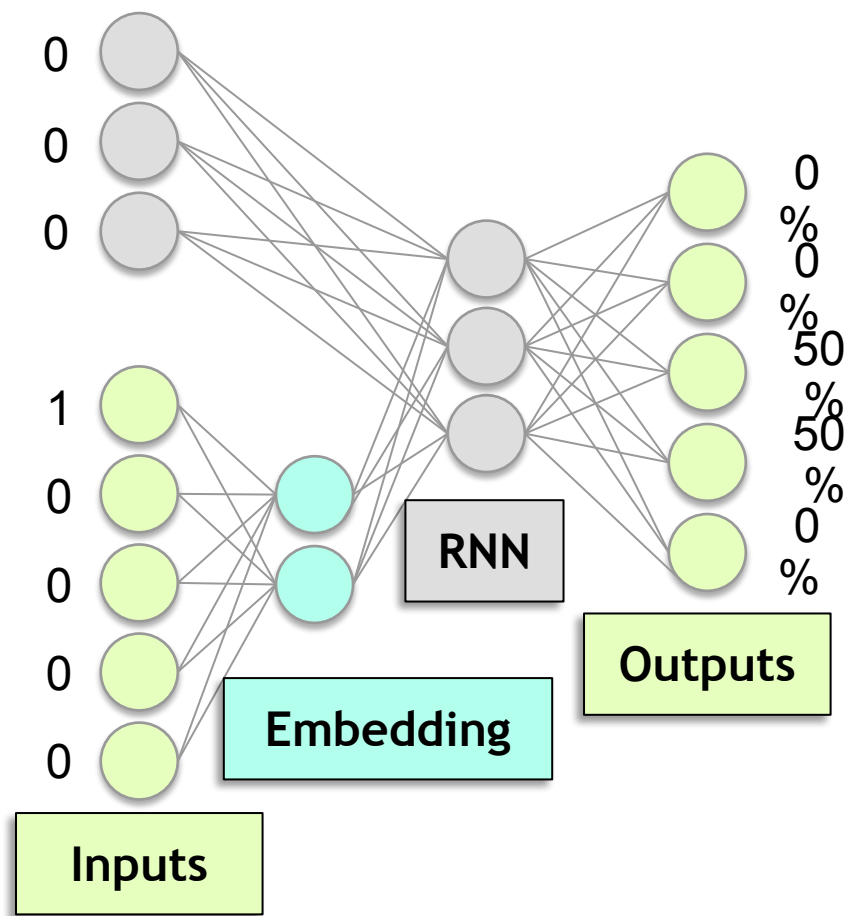
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DICTIONARY

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RECURRENT NEURAL NETWORKS



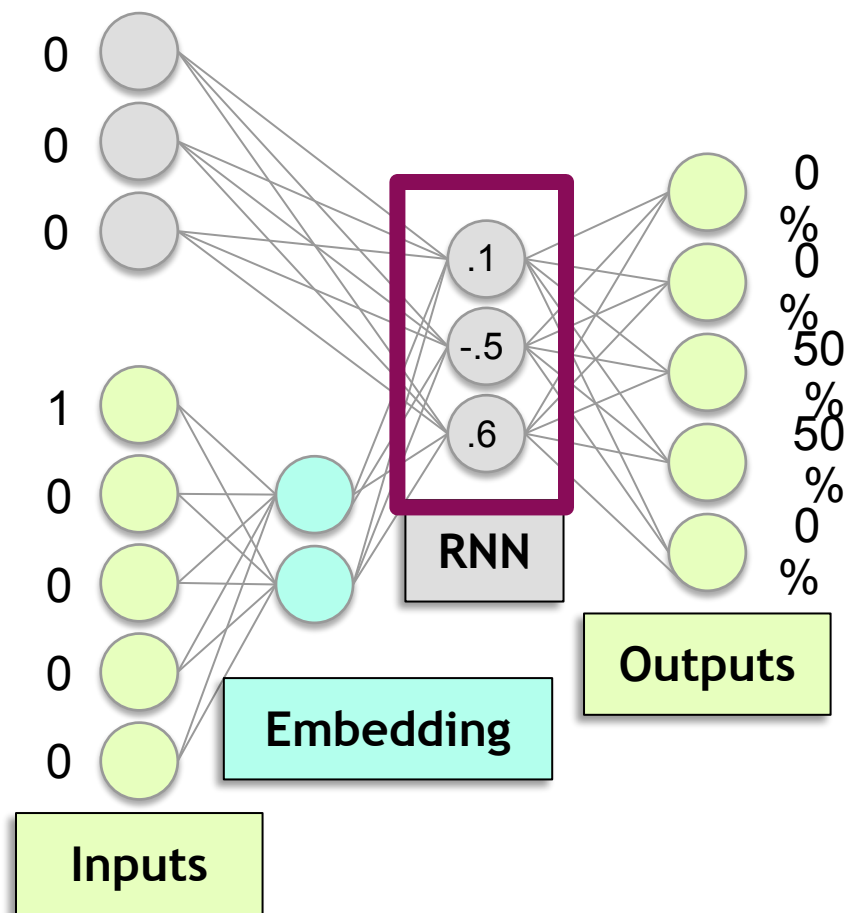
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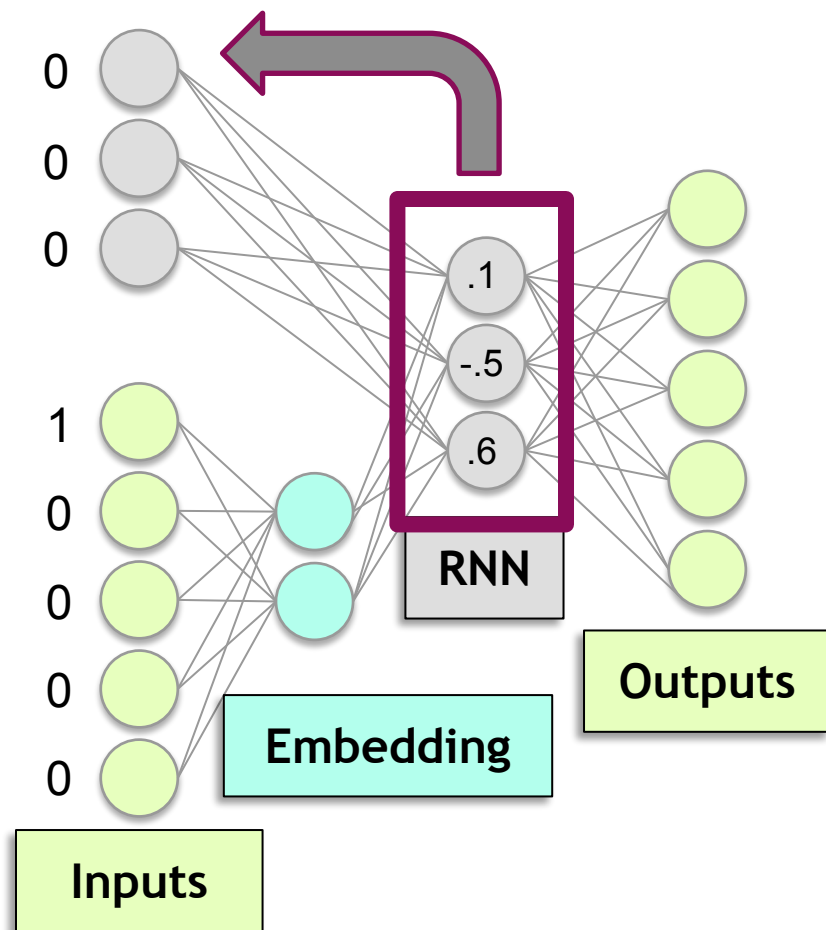
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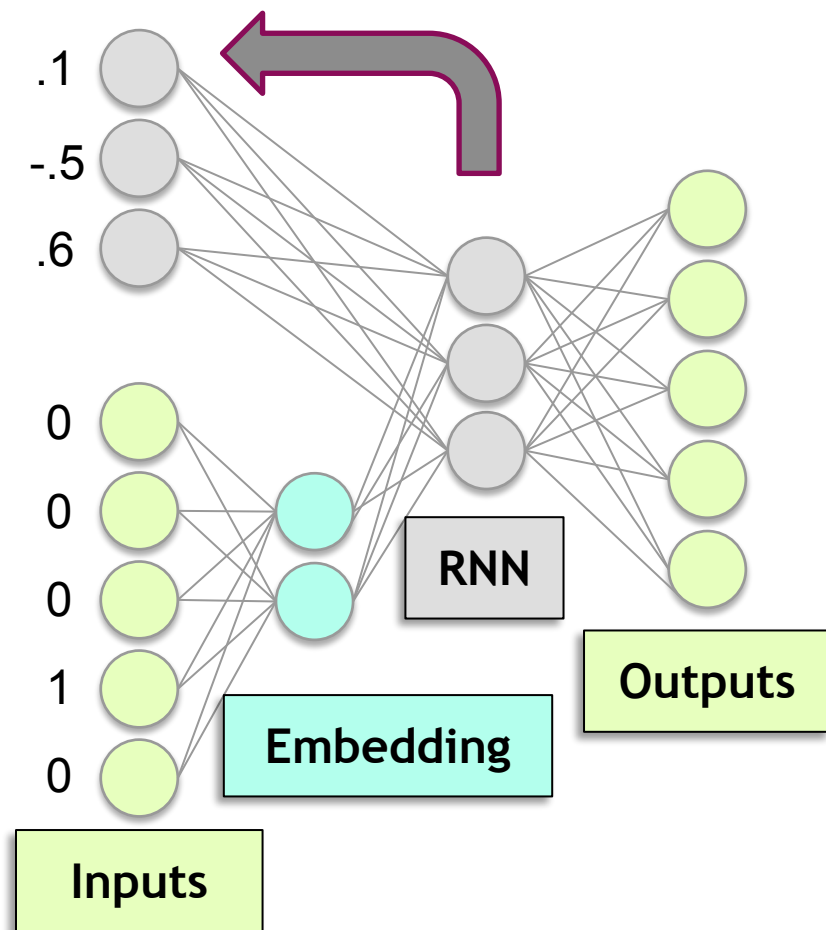
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RECURRENT NEURAL NETWORKS



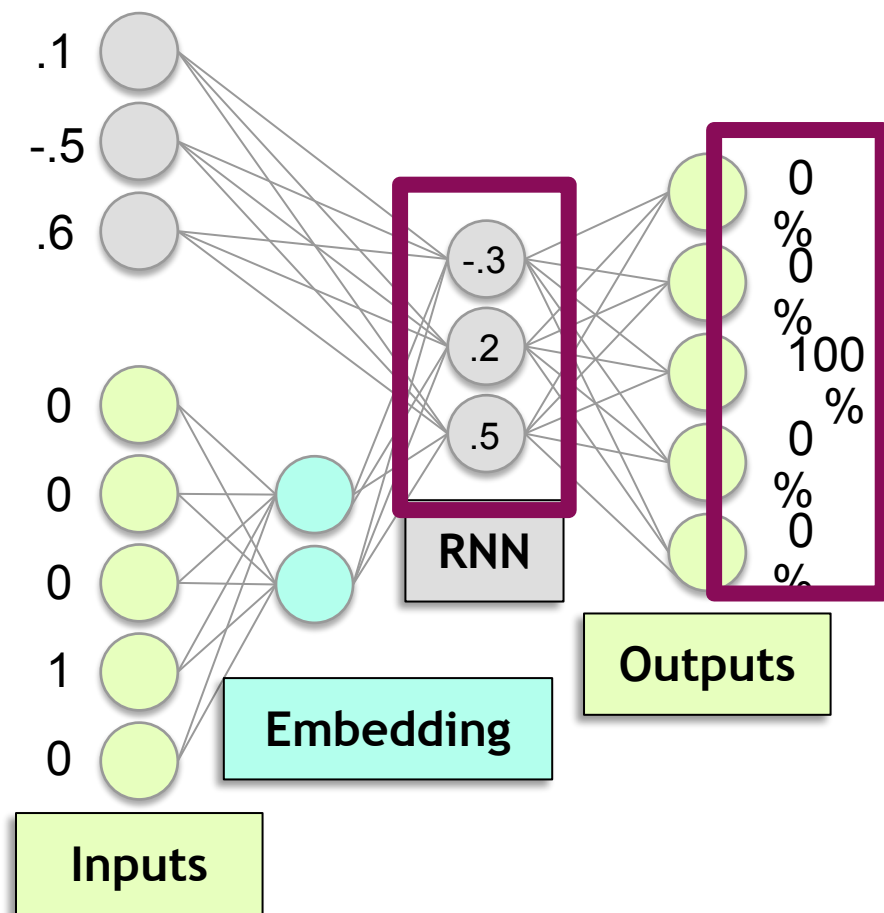
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5. WOOF

RECURRENT NEURAL NETWORKS



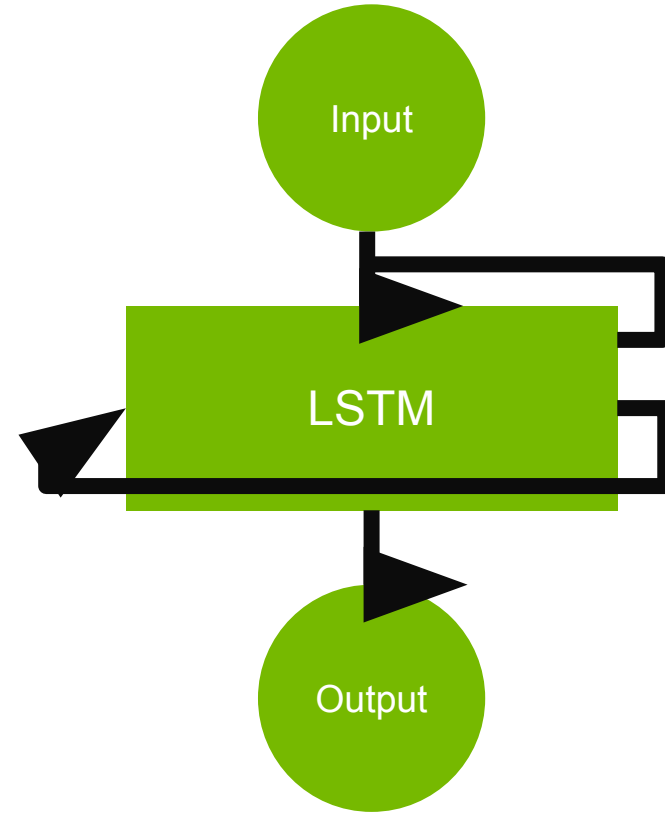
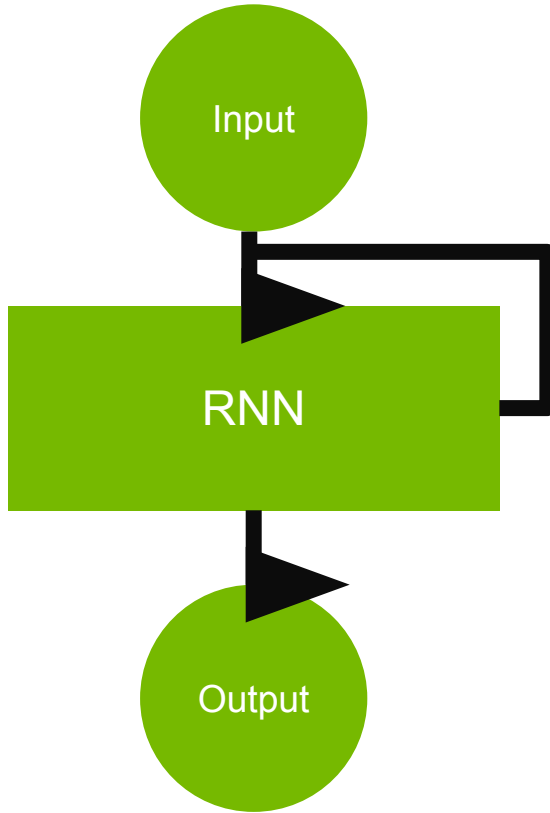
“Cats say ____.”

“Dogs say ____.”

DICTIONARY

1. CATS
2. DOGS
3. MEOW
4. SAY
5. WOOF

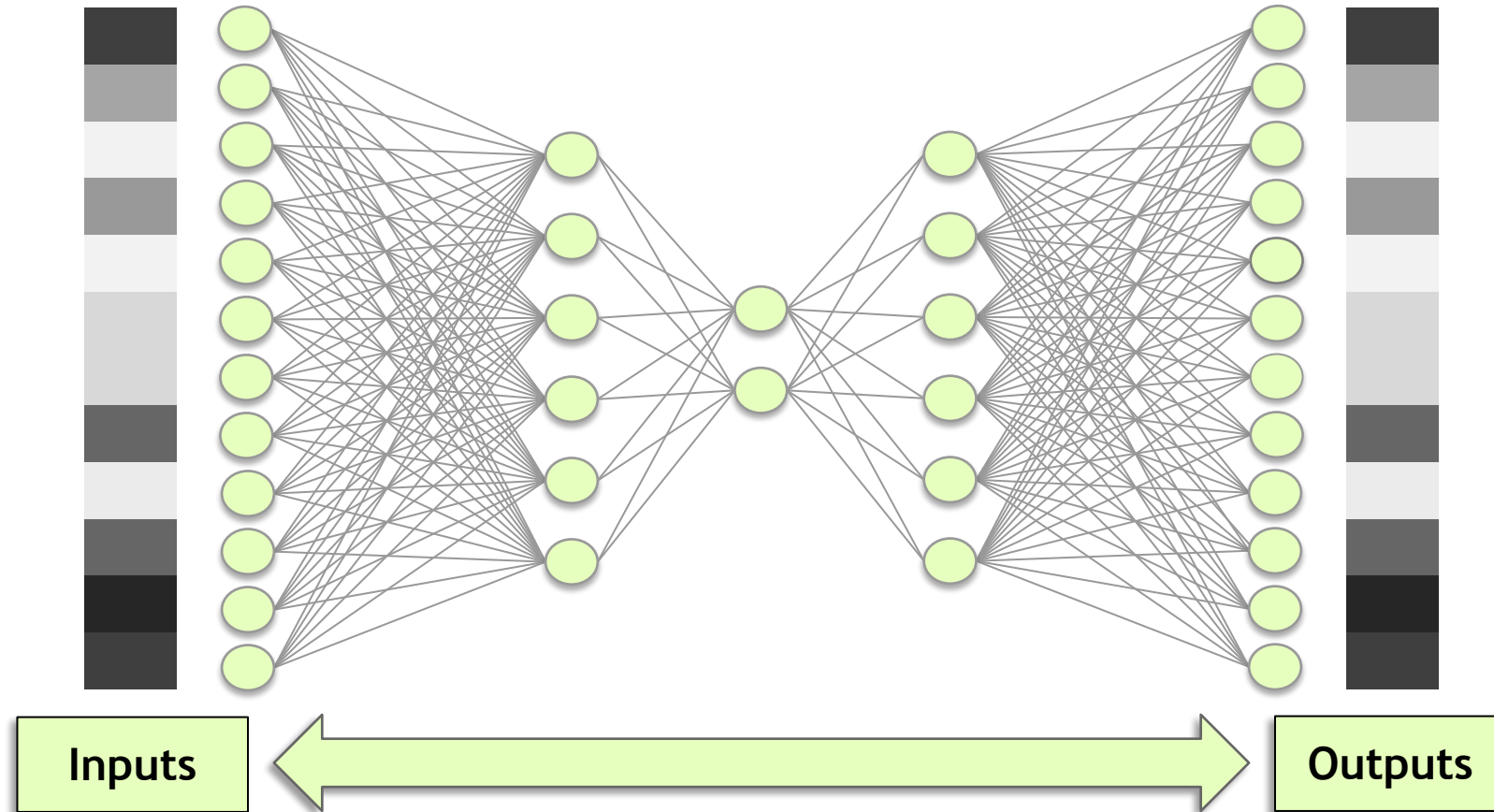
RECURRENT NEURAL NETWORKS



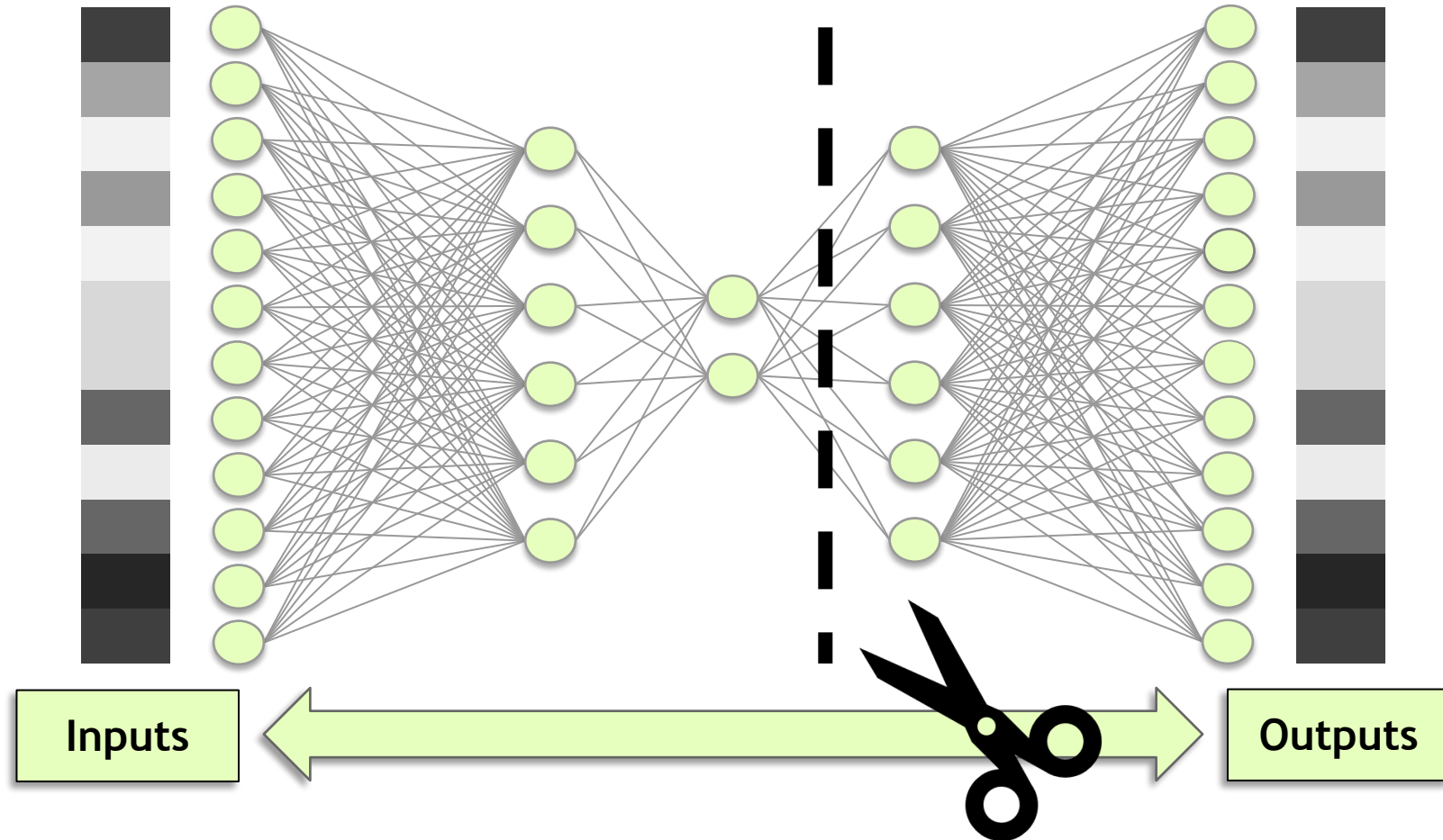


OTHER ARCHITECTURES

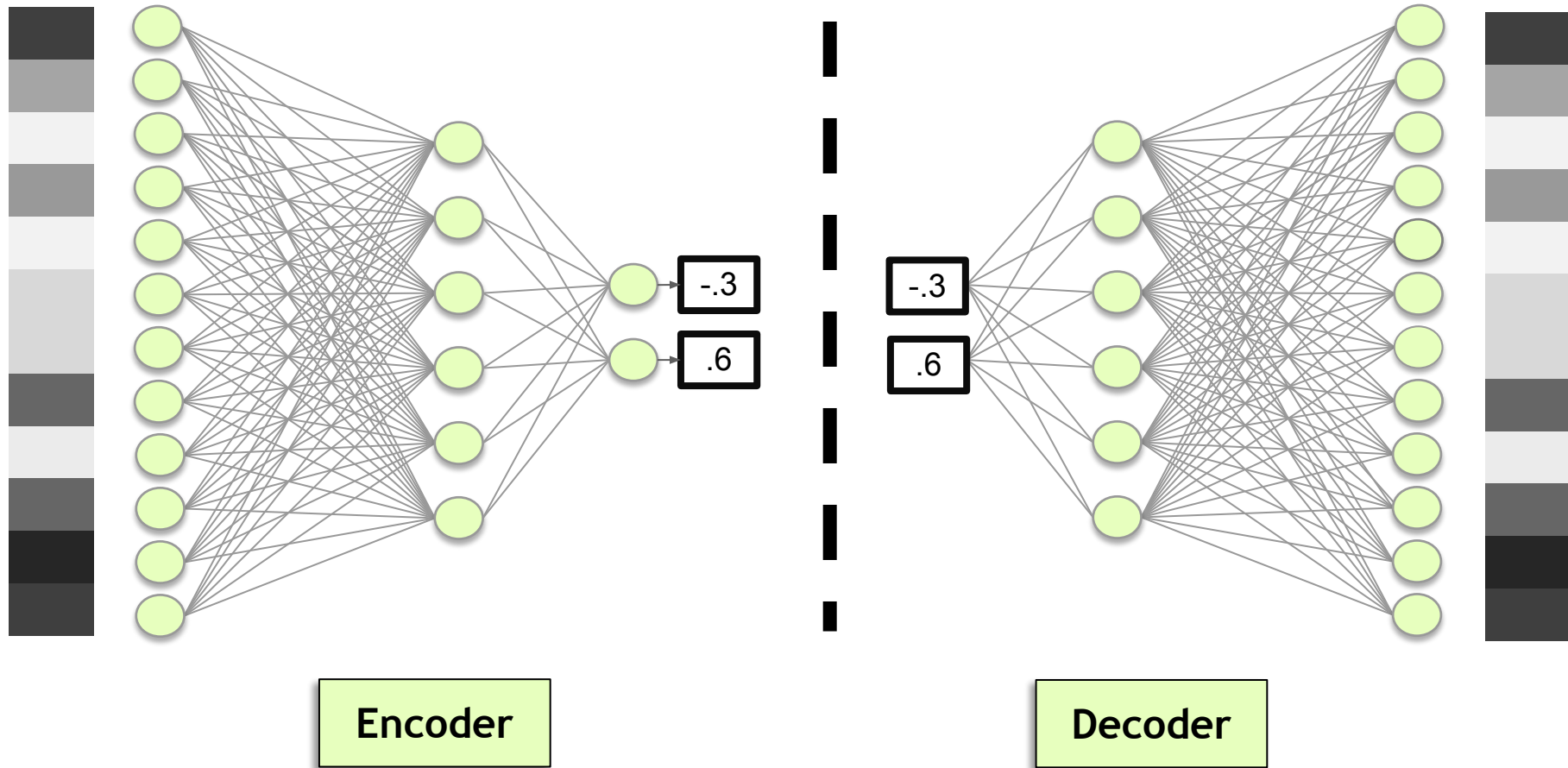
AUTOENCODERS



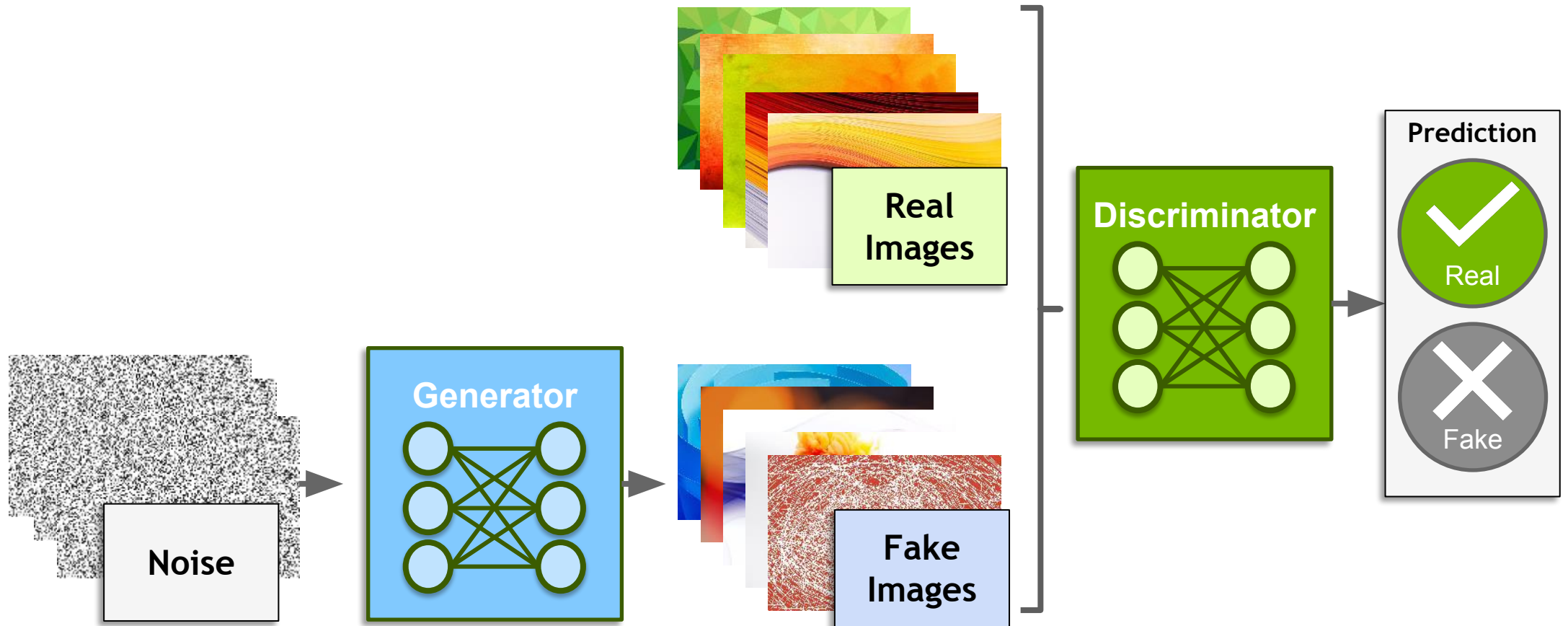
AUTOENCODERS



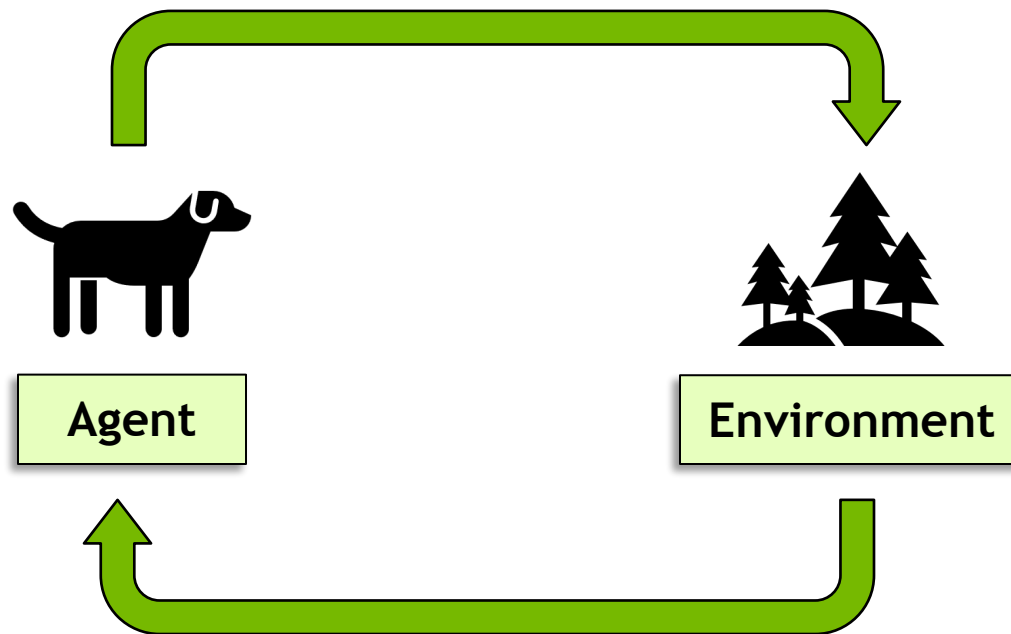
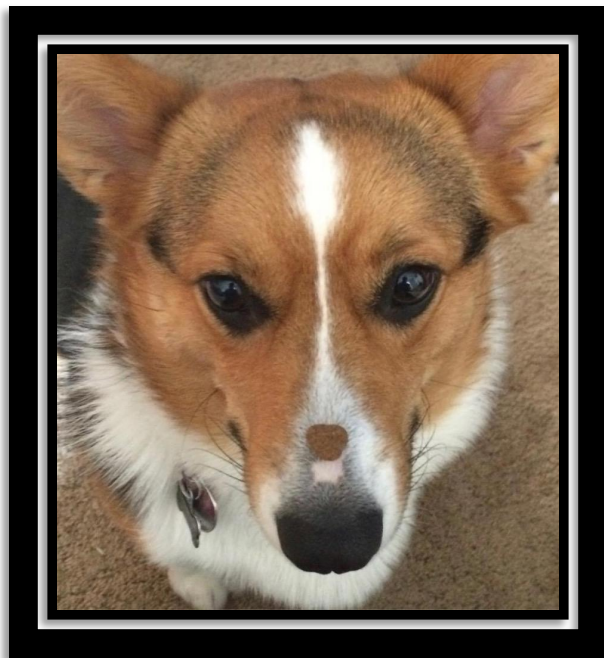
AUTOENCODERS



GENERATIVE ADVERSARIAL NETWORKS (GANS)



REINFORCEMENT LEARNING





NEXT STEPS

ENABLING PORTABILITY WITH NGC CONTAINERS

Extensive

- Diverse range of workloads and industry specific use cases

Optimized

- DL containers updated monthly
- Packed with latest features and superior performance

Secure & Reliable

- Scanned for vulnerabilities and crypto
- Tested on workstations, servers, & cloud instances

Scalable

- Supports multi-GPU & multi-node systems

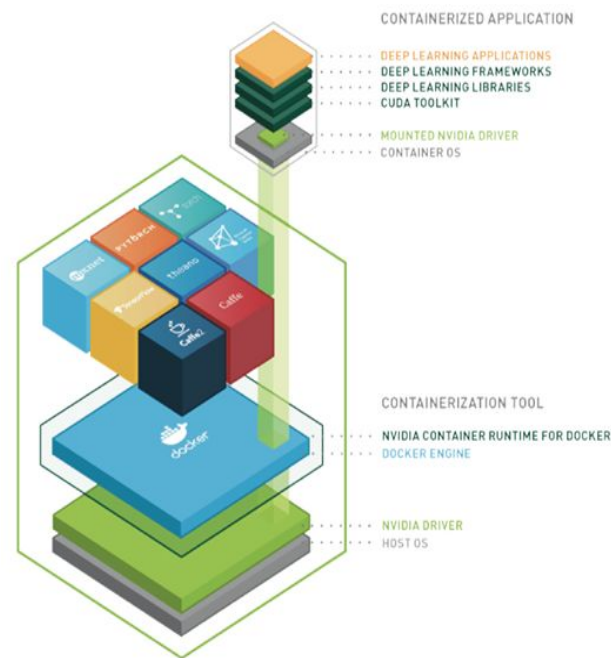
Designed for Enterprise & HPC

- Supports Docker, Singularity & other runtimes

Run Anywhere

- Bare metal, VMs, Kubernetes
- x86, ARM, POWER
- Multi-cloud, on-prem, hybrid, edge

NGC Deep Learning Containers



CONVERSATIONAL AI



JARVIS

HEALTHCARE



CLARA

SMART CITIES



DEEPSTREAM &
SMART PARKING

TELECOM



AERIAL

AUTONOMOUS DRIVING



DRIVE

ROBOTICS



ISAAC

HPC



HPC SDK

[Learn more about NGC Containers](#)

NEXT STEPS FOR THIS CLASS

Catalog: Containers / Containers: nvidia:dli-dl-fundamentals

DLI Deep Learning Fundamentals Course -...

Publisher	Built By	Latest Tag	Modified	Size
NVIDIA	NVIDIA	v0.0.1	October 27, 2020	4.19 GB

Multinode Support
No

Multi-Arch Support
✕

Description
Base environment used in the NVIDIA Deep Learning Institute (DLI) Course Fundamentals of Deep Learning, along with Next Steps project.

Labels

Computer Vision DLI Jupyter Machine Learning Machine Learning & AI

Pull Command

```
docker pull nvcr.io/nvidia/dli-dl-fundamentals:v0.0.1
```

Step 1 Setup Docker

<https://www.docker.com/>

Step 2 Visit NGC Catalog

<https://ngc.nvidia.com/catalog/containers/nvidia:dli-dl-fundamentals>

Step 3 Pull and Run Container

Visit localhost:8888 to check out a JupyterLab environment with a Next Steps Project



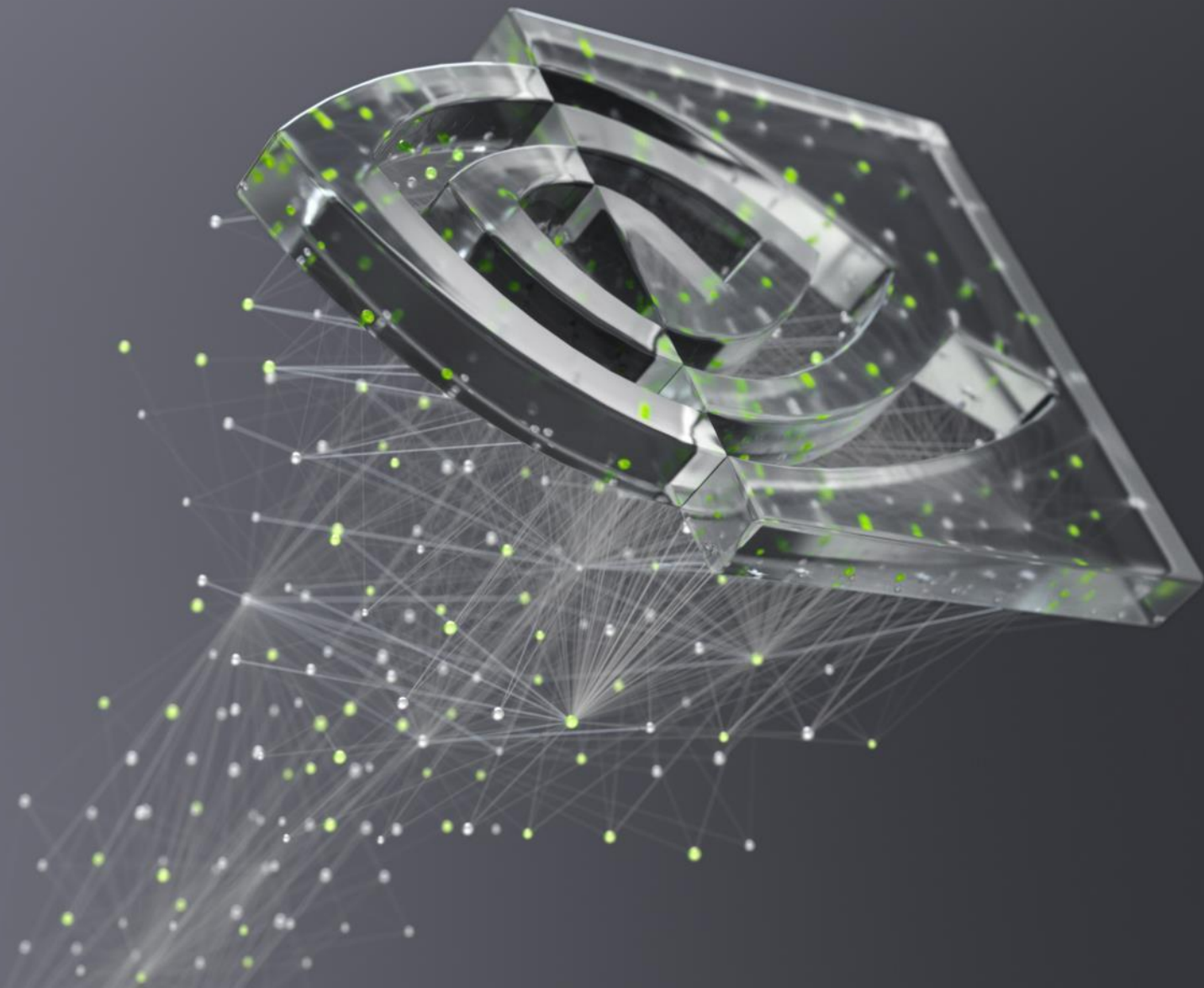
CLOSING THOUGHTS

COPYING ROCKET SCIENCE





LET'S GET STARTED!



DEEP
LEARNING
INSTITUTE