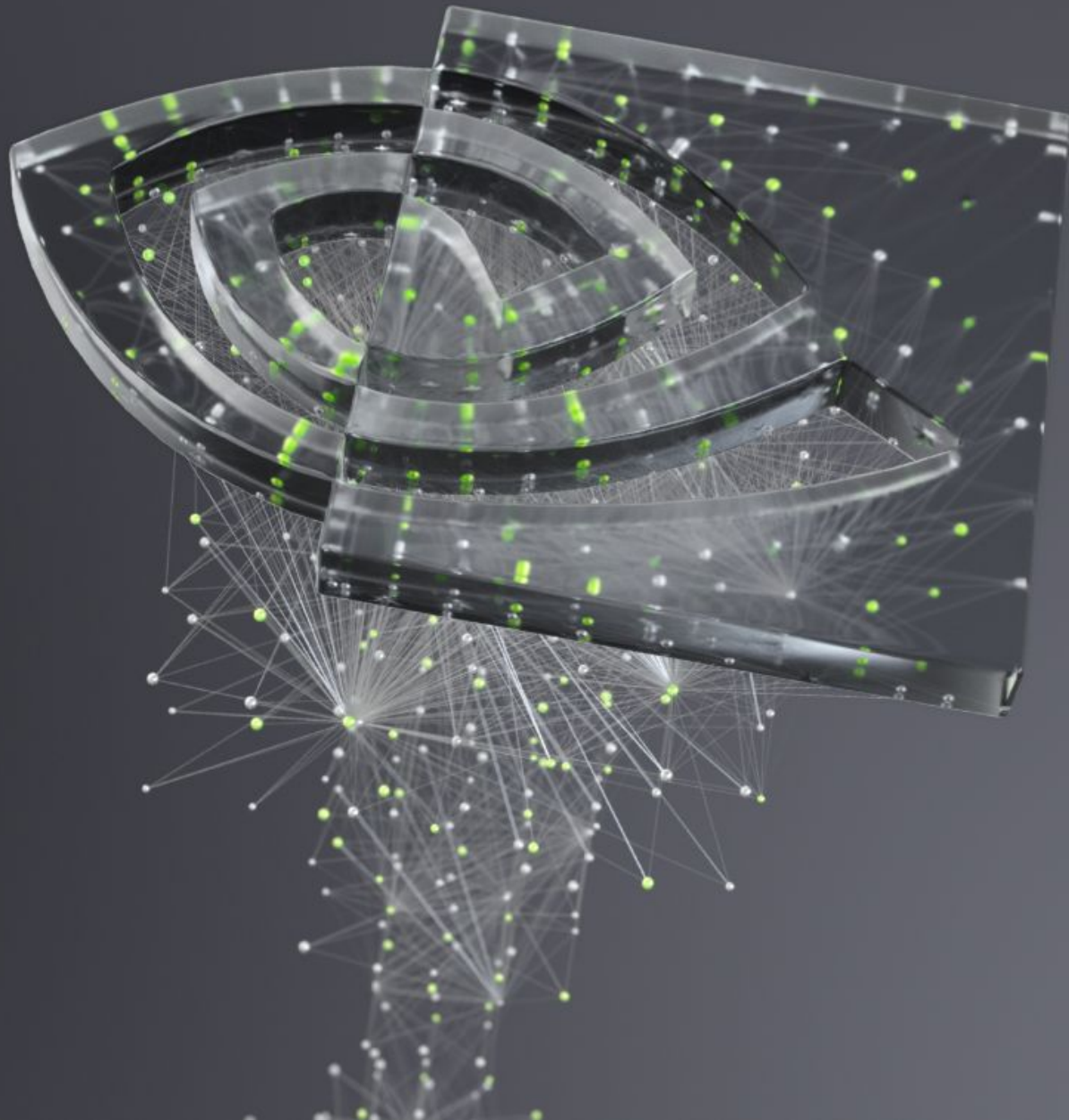




DEEP
LEARNING
INSTITUTE

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

- Optometry



Natural Language Processing

- Linguistics



Reinforcement Learning

- Game Theory
- Psychology



Anomaly Detection

- Security
- Medicine

FIELDS OF AI



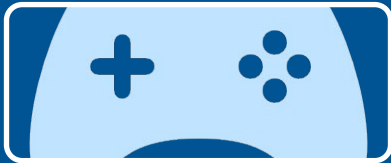
Computer Vision

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Natural Language Processing

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Reinforcement Learning

- Game Theory
- Psychology



Anomaly Detection

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- Medicine

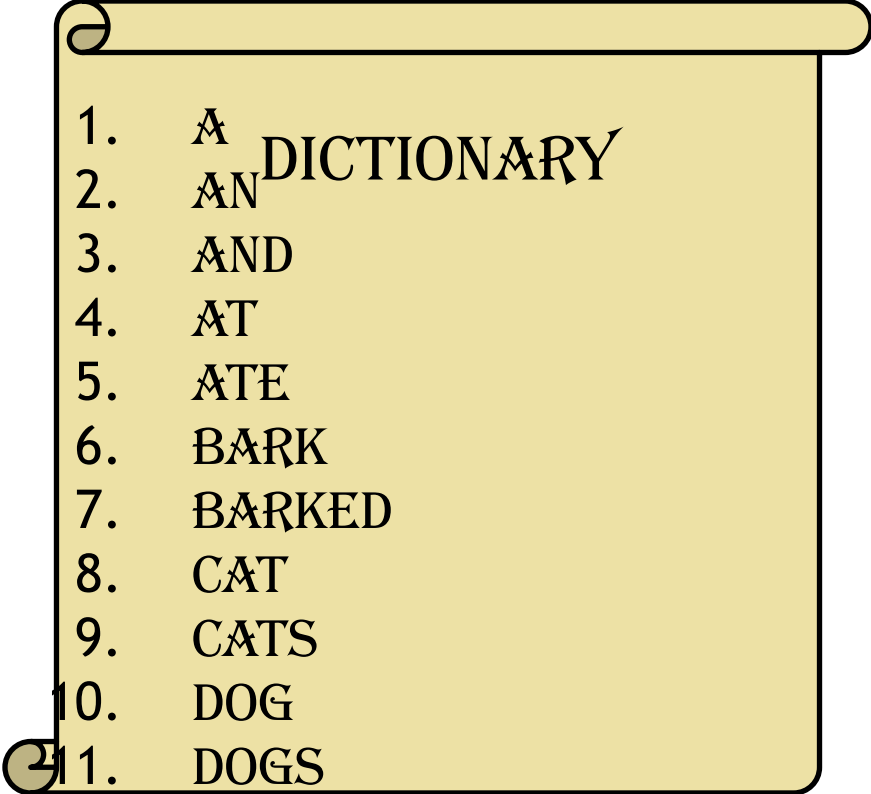


NATURAL LANGUAGE PROCESSING

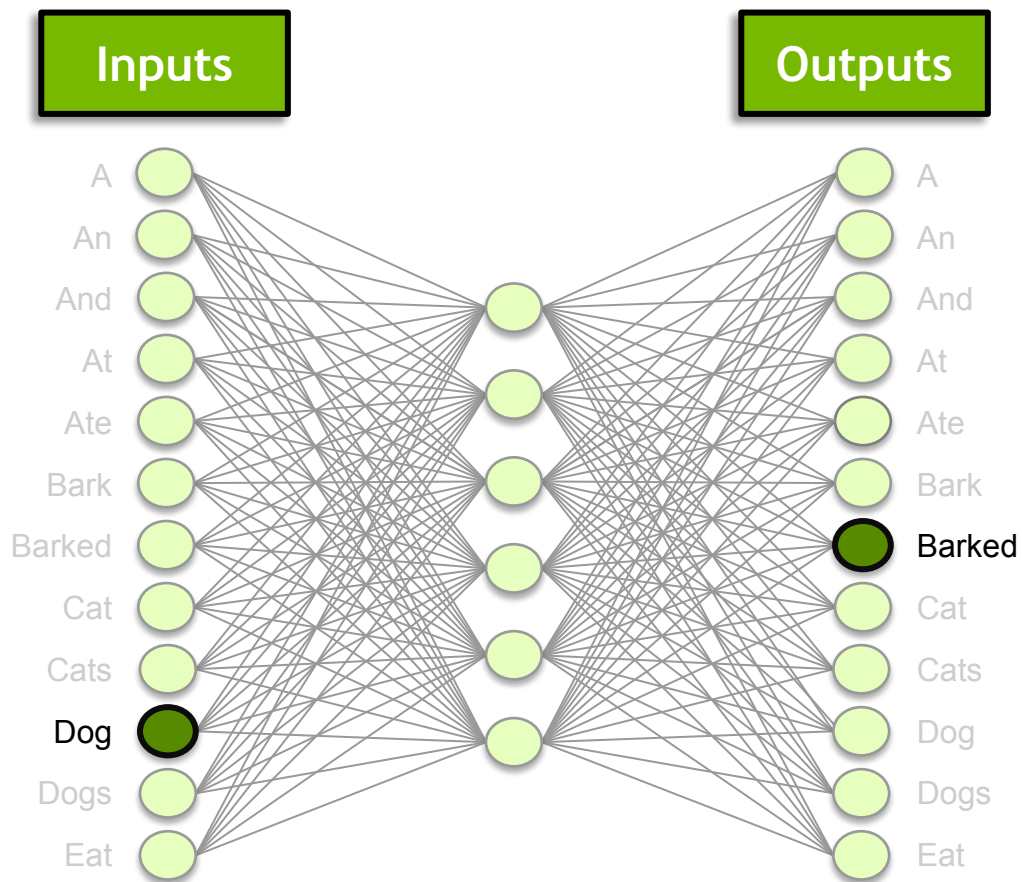
FROM WORDS TO NUMBERS

“A dog barked at a cat.”

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

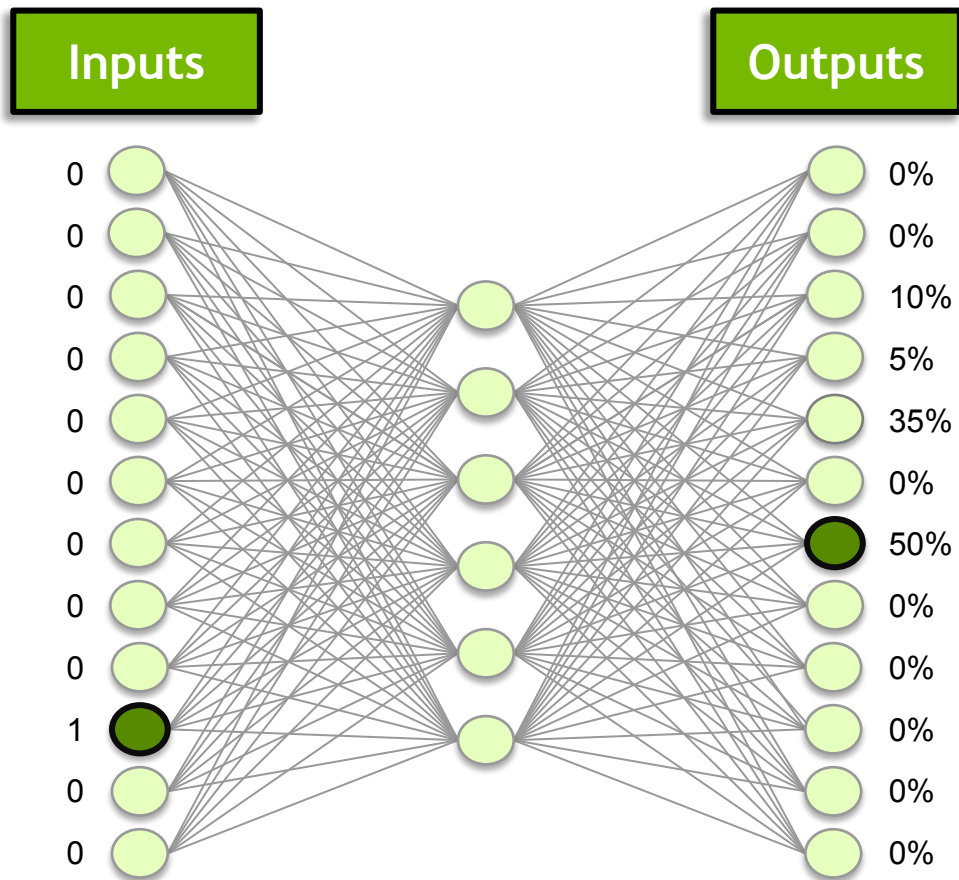
- 
1. A
 2. AN
 3. AND
 4. AT
 5. ATE
 6. BARK
 7. BARKED
 8. CAT
 9. CATS
 10. DOG
 11. DOGS
 12. EAT

FROM WORDS TO NUMBERS



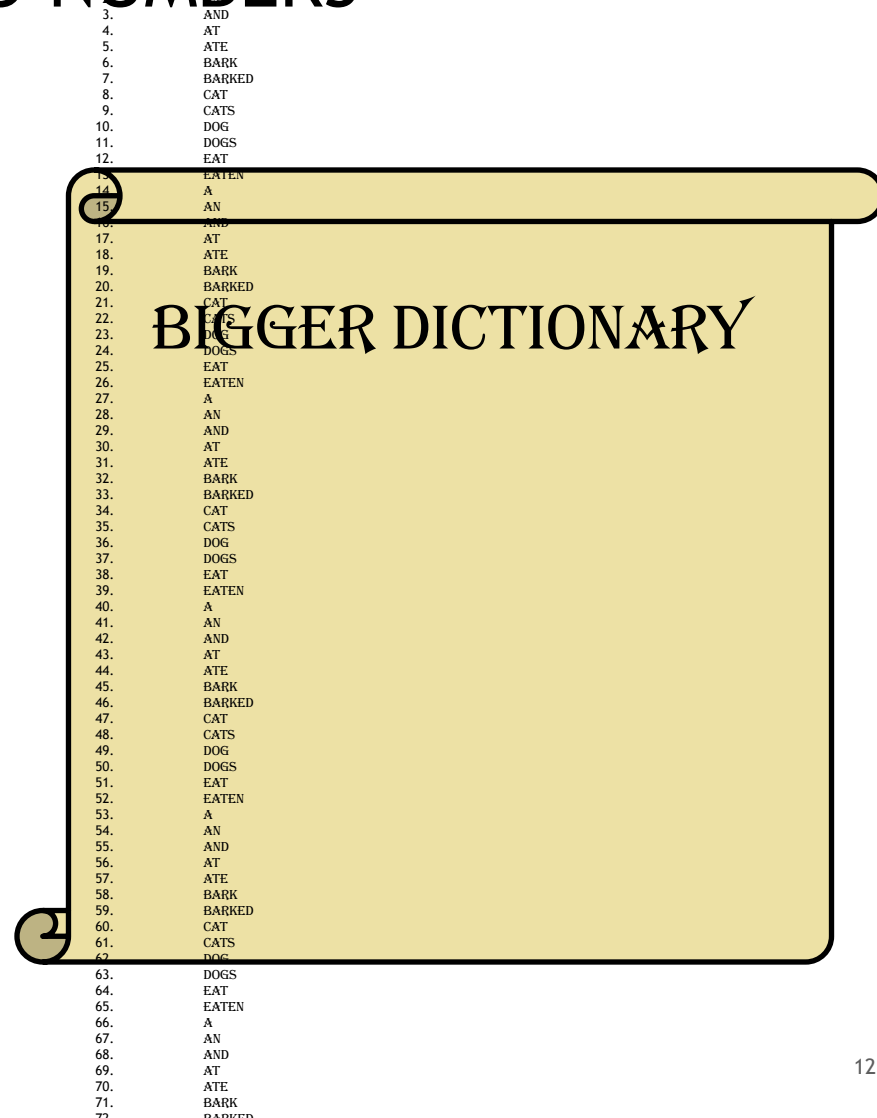
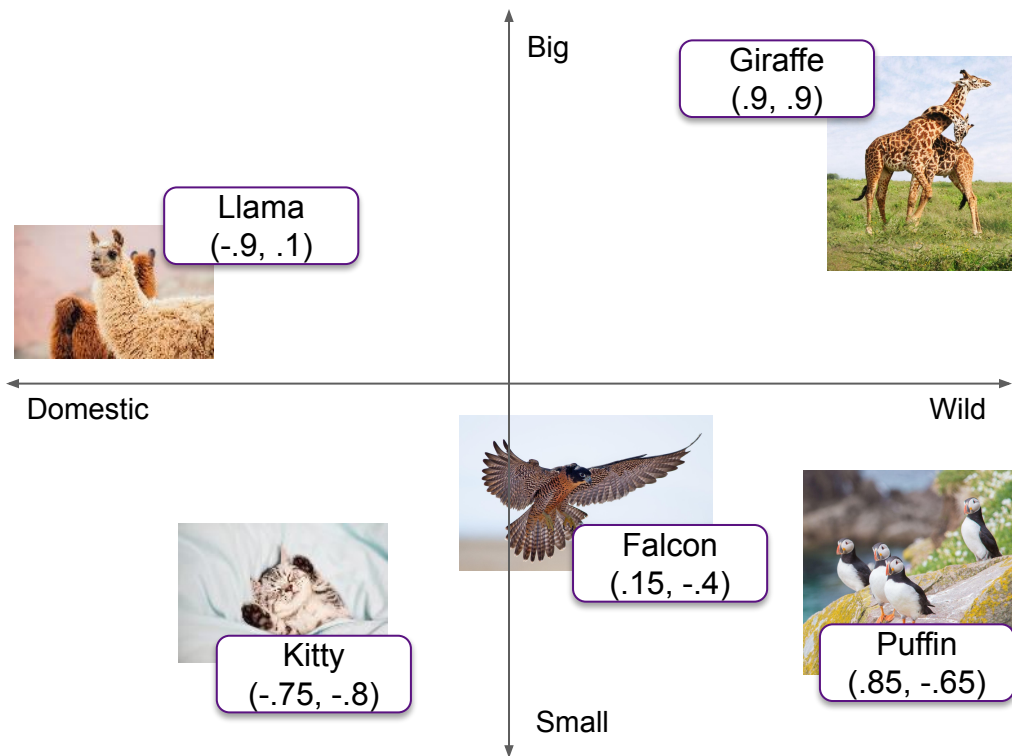
- DICTIONARY**
1. A
 2. AN
 3. AND
 4. AT
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 6. BARK
 7. BARKED
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 9. CATS
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FROM WORDS TO NUMBERS

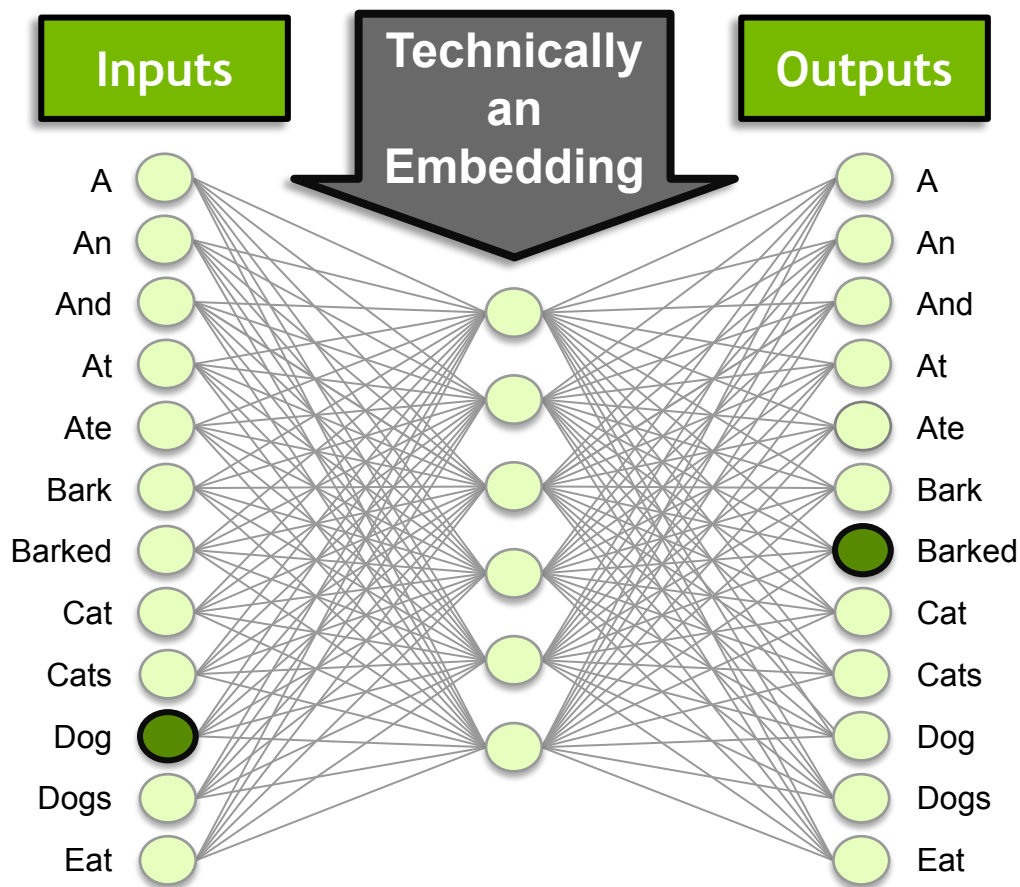


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- DICTIONARY

FROM WORDS TO NUMBERS



FROM WORDS TO NUMBERS



-
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RECURRENT NEURAL NETWORKS

RECURRENT NEURAL NETWORKS

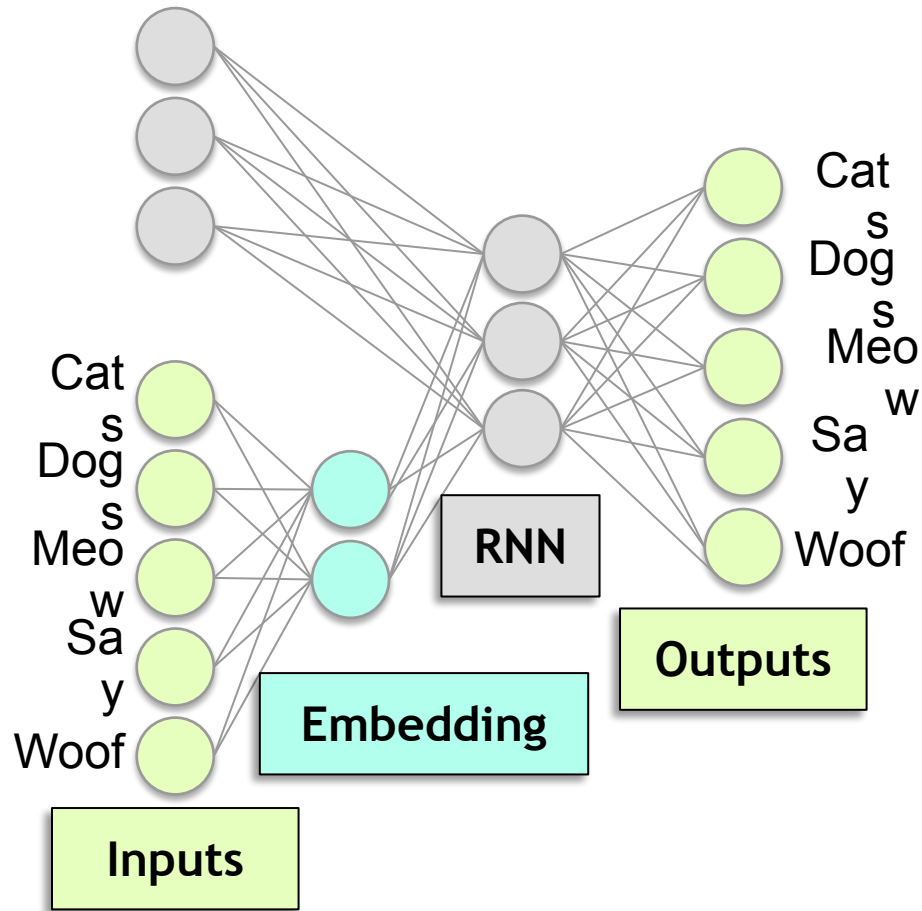
“Cats say ____.”

“Dogs say ____.”

DICTIONARY

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

RECURRENT NEURAL NETWORKS



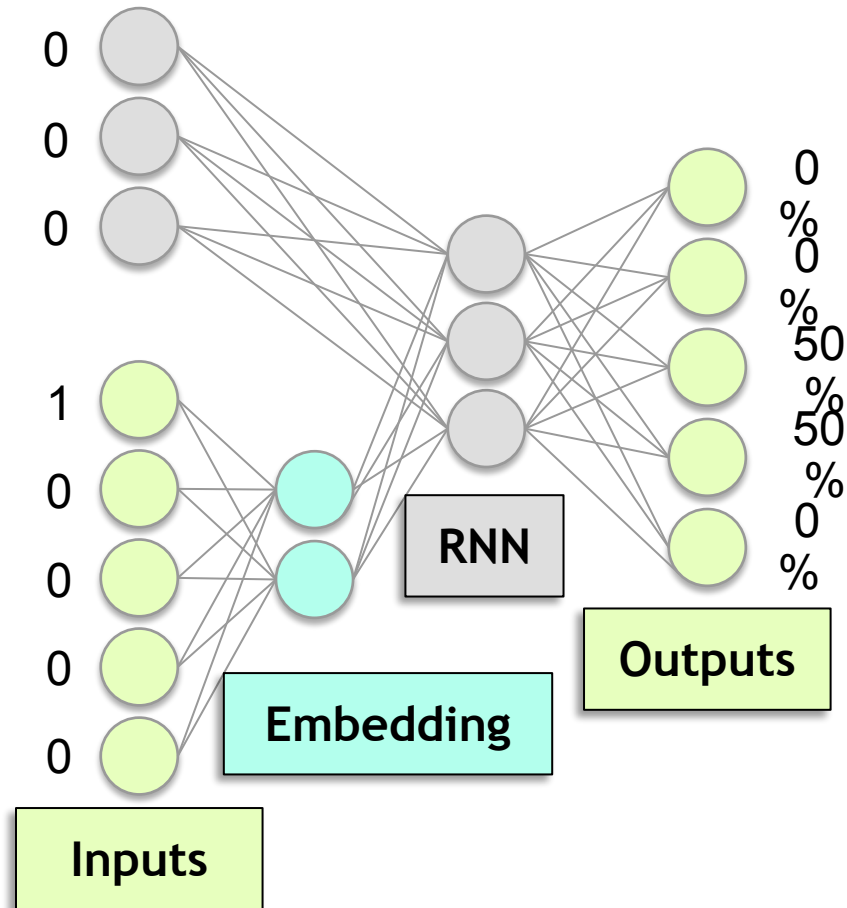
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DICTIONARY

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RECURRENT NEURAL NETWORKS



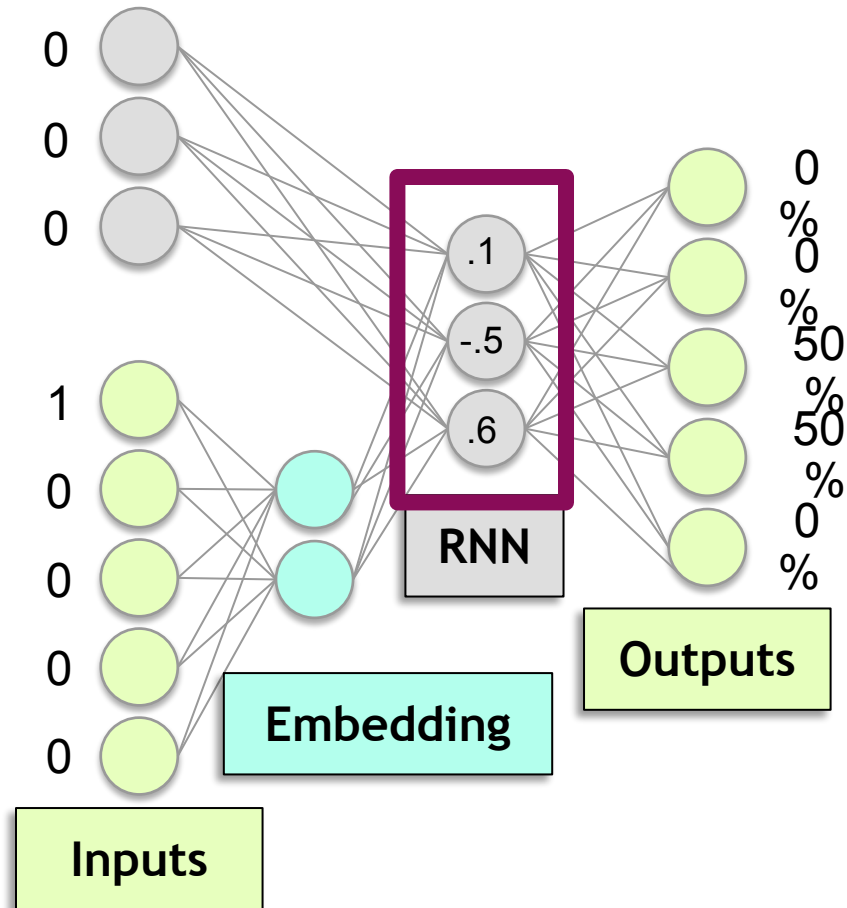
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DICTIONARY

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RECURRENT NEURAL NETWORKS



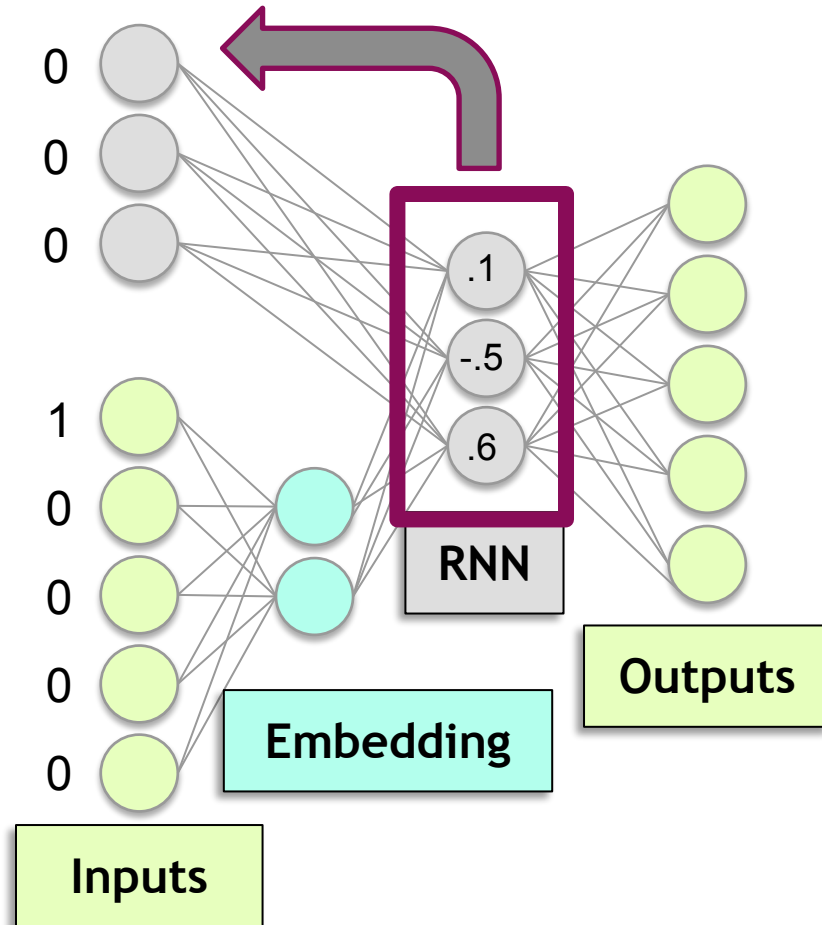
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DICTIONARY

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RECURRENT NEURAL NETWORKS



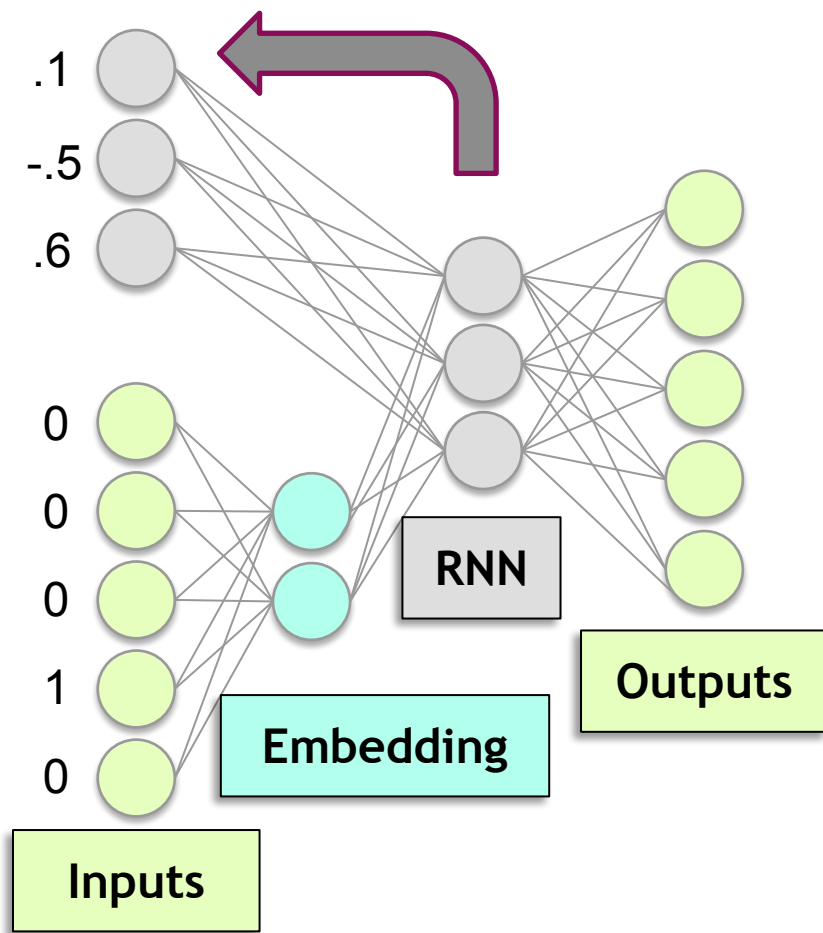
“Cats say ____.”

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DICTIONARY

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RECURRENT NEURAL NETWORKS



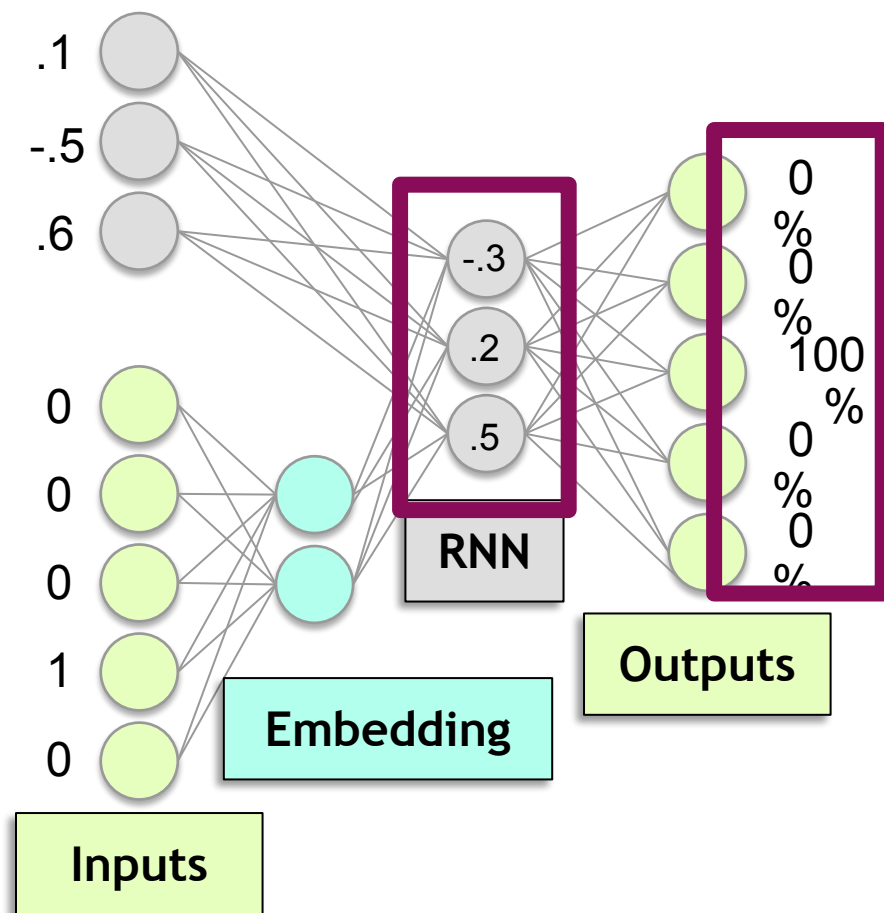
"Cats say ____."

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DICTIONARY

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RECURRENT NEURAL NETWORKS



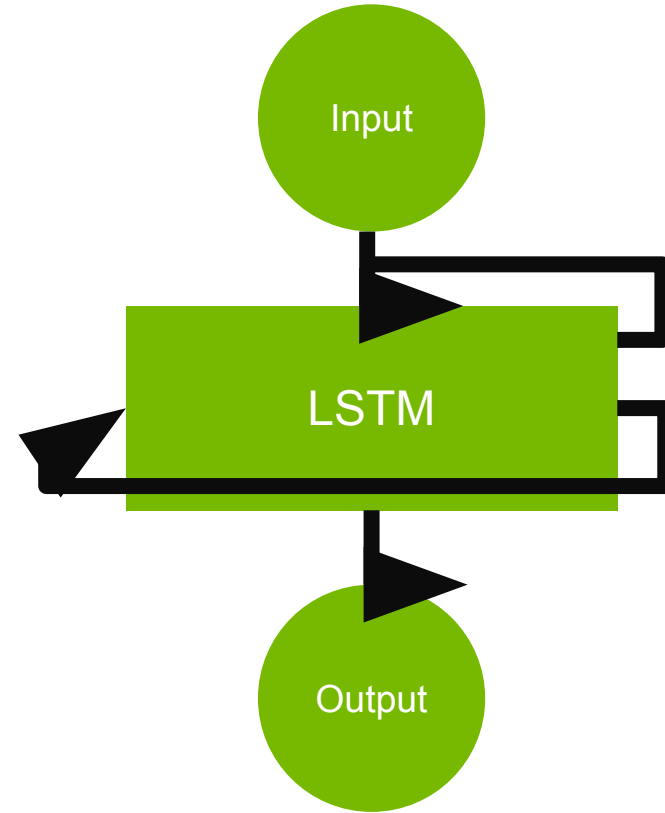
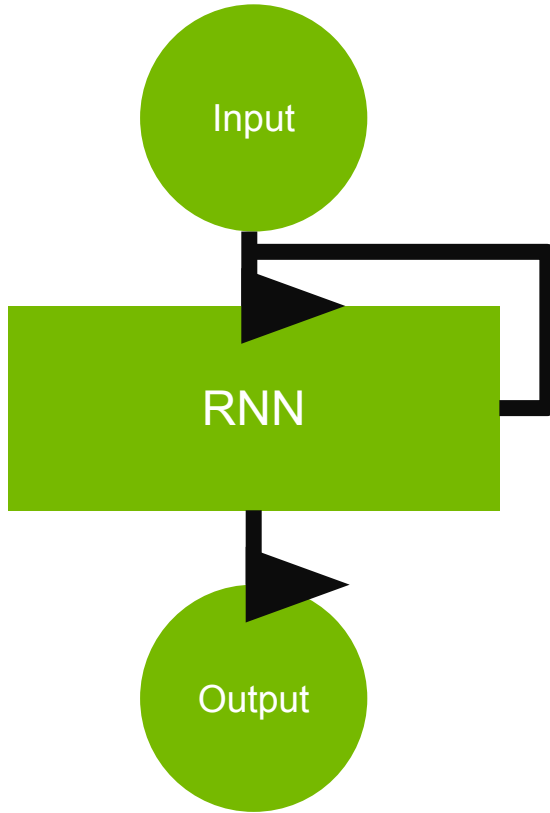
“Cats say ____.”

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DICTIONARY

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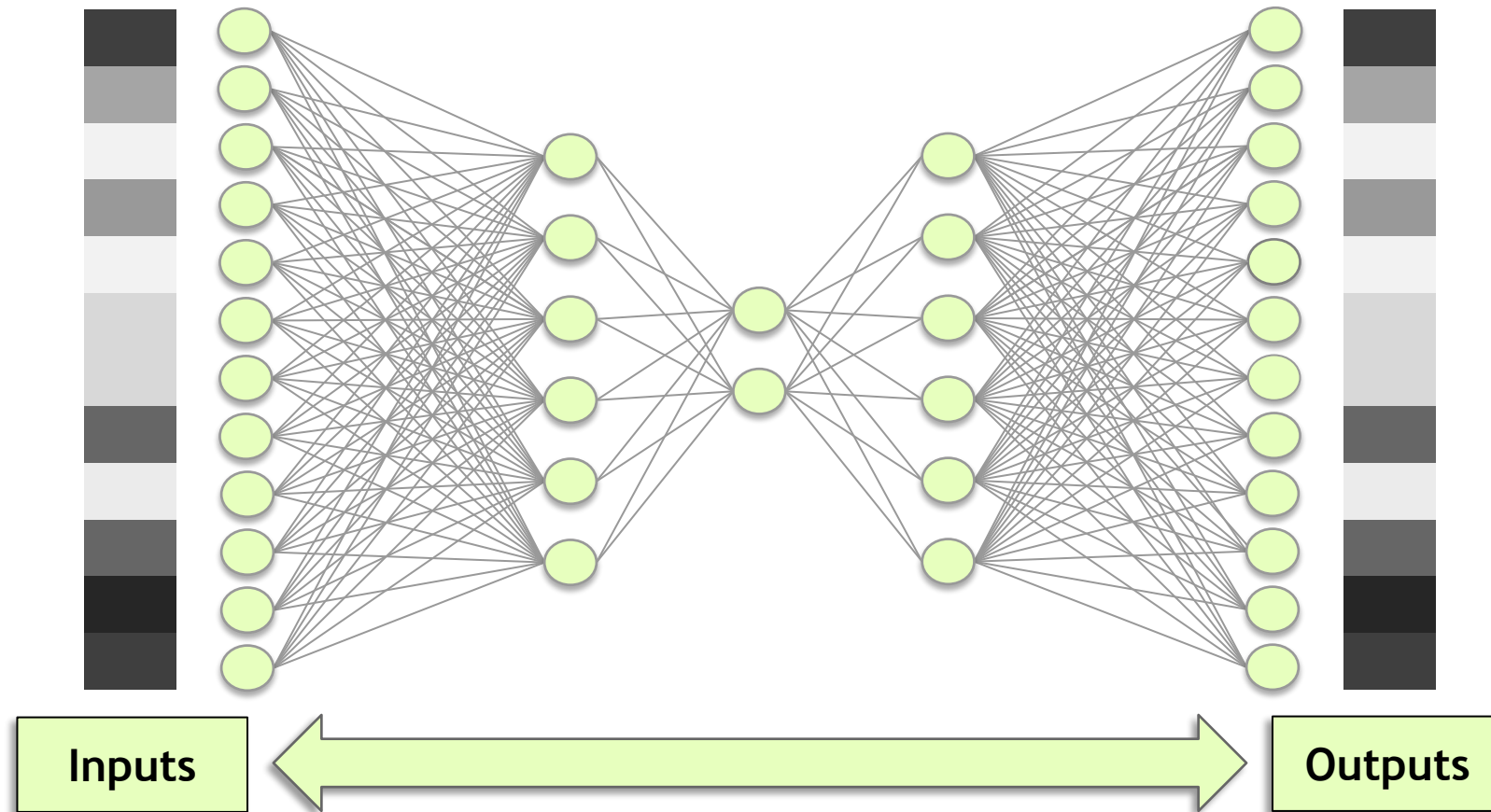
RECURRENT NEURAL NETWORKS



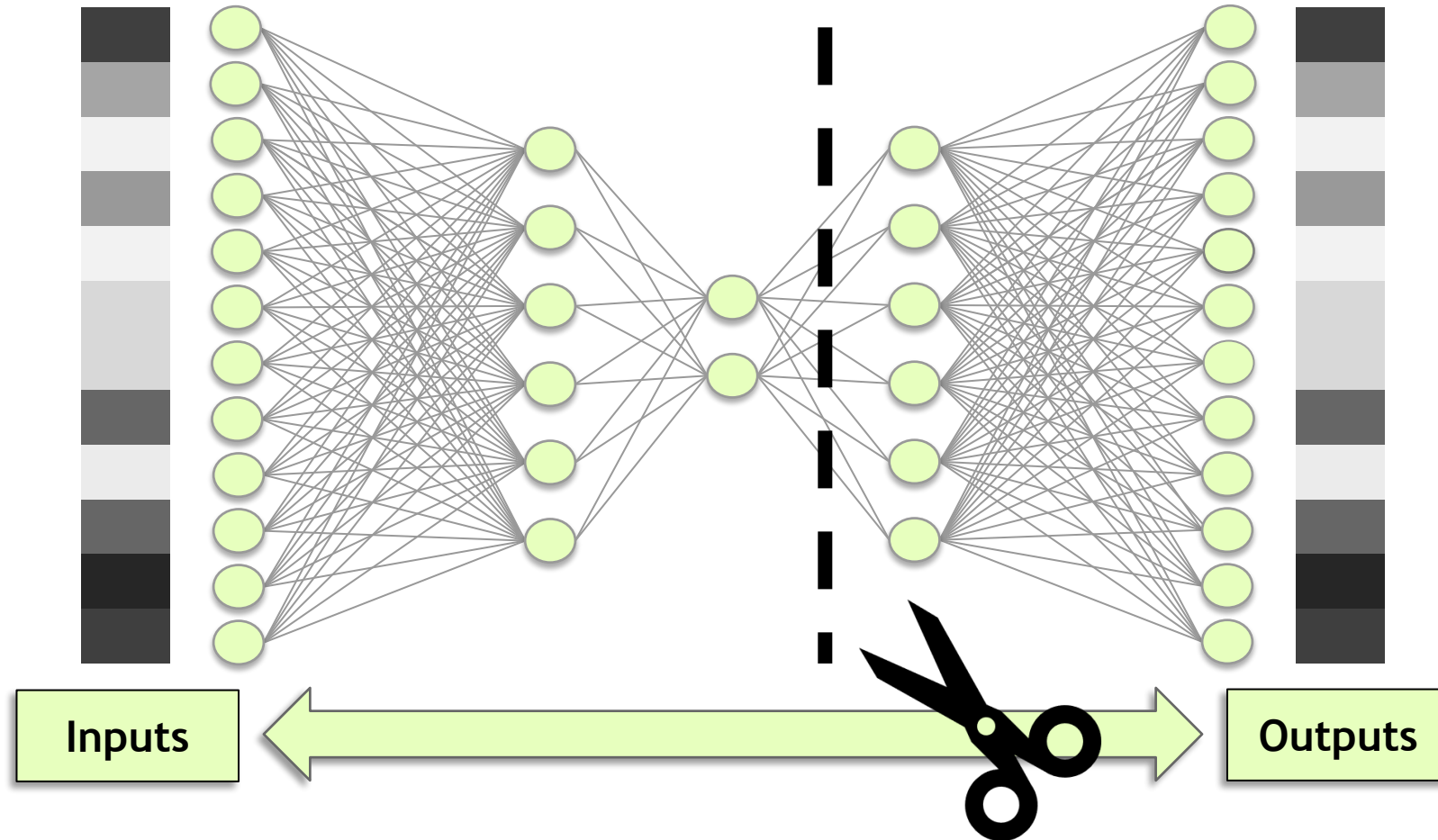


OTHER ARCHITECTURES

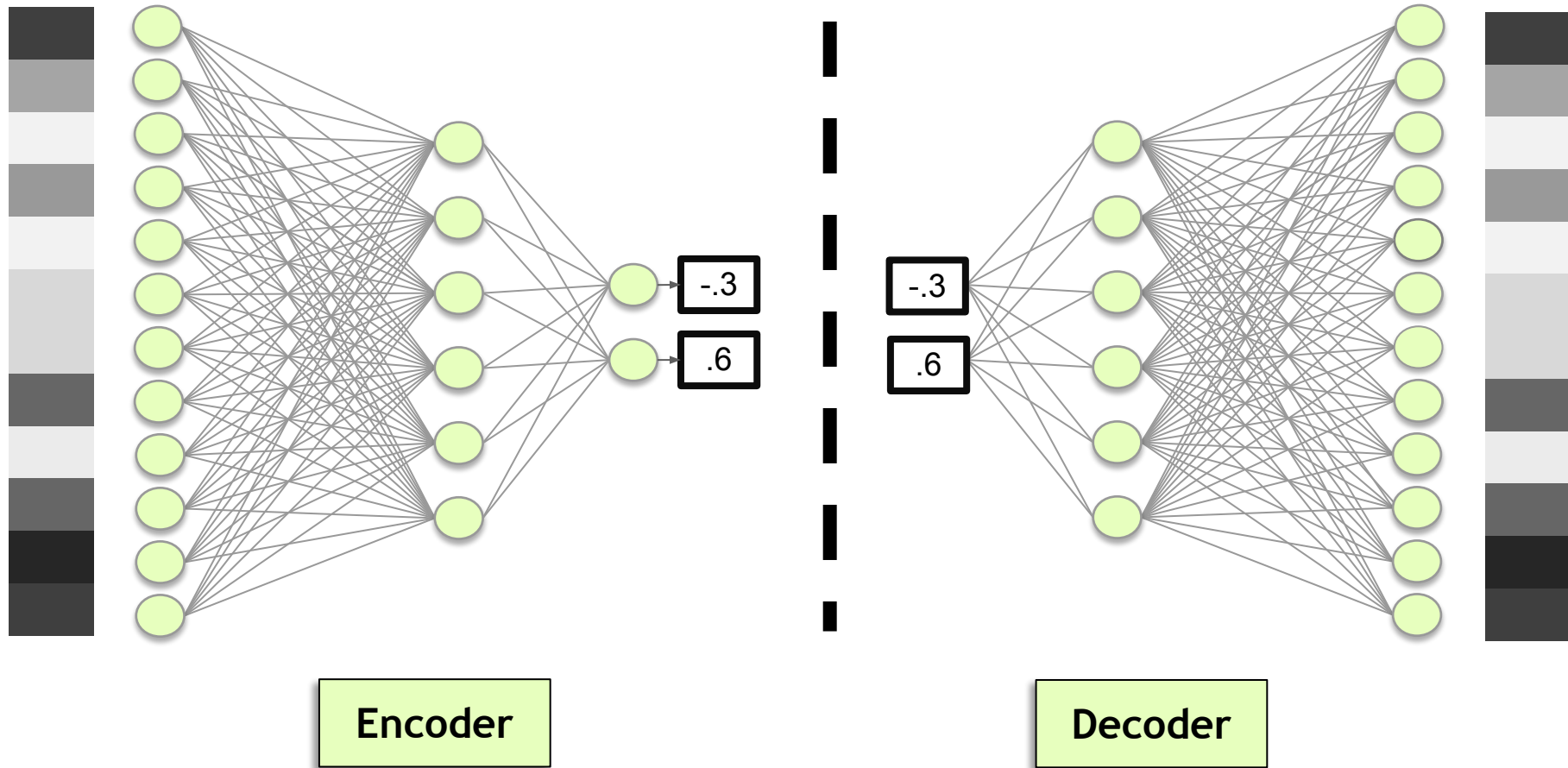
AUTOENCODERS



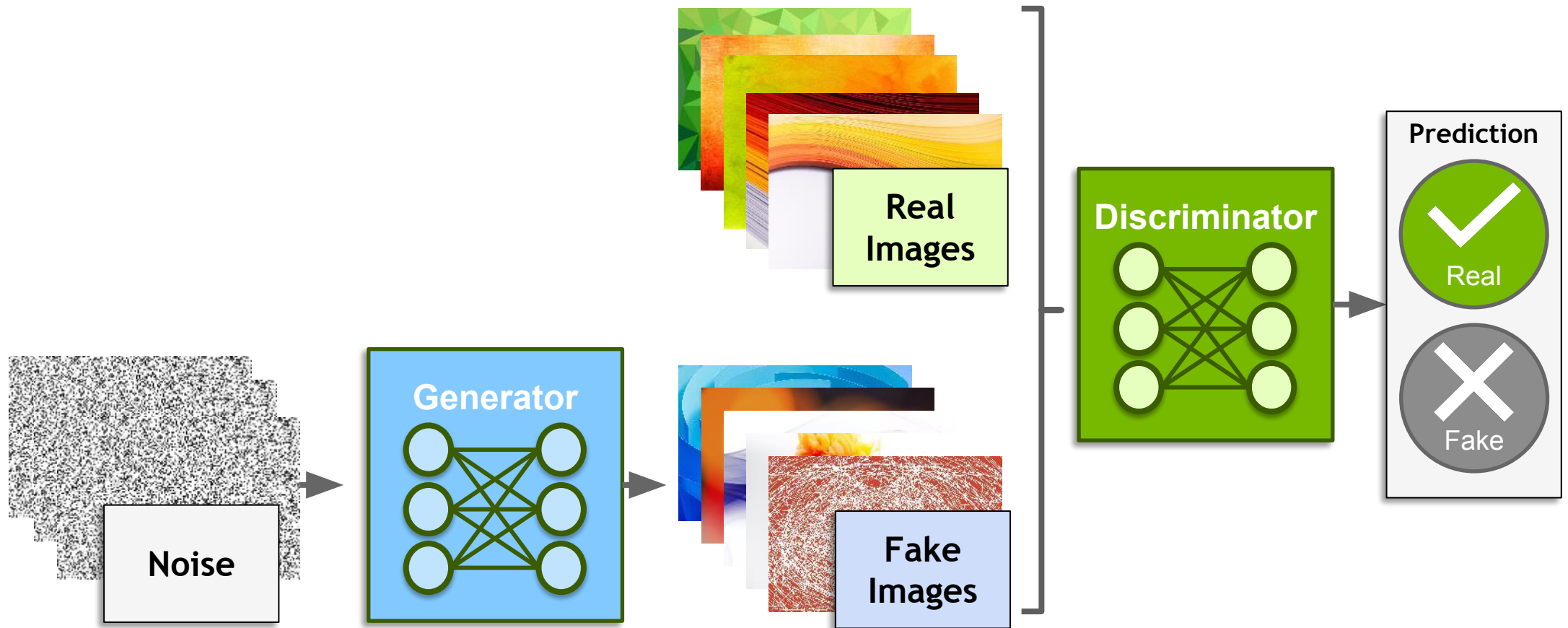
AUTOENCODERS



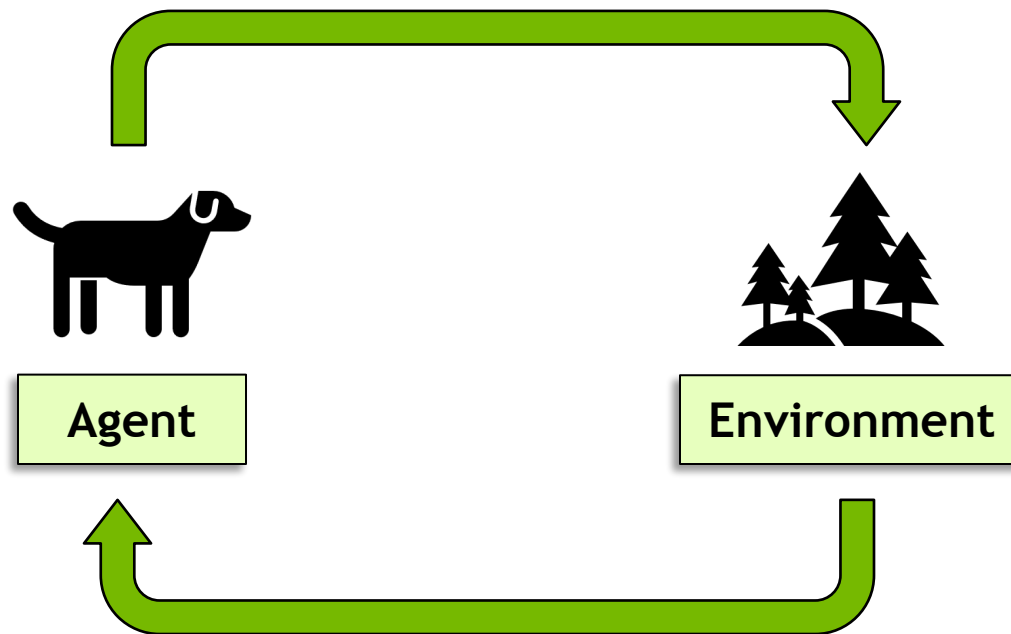
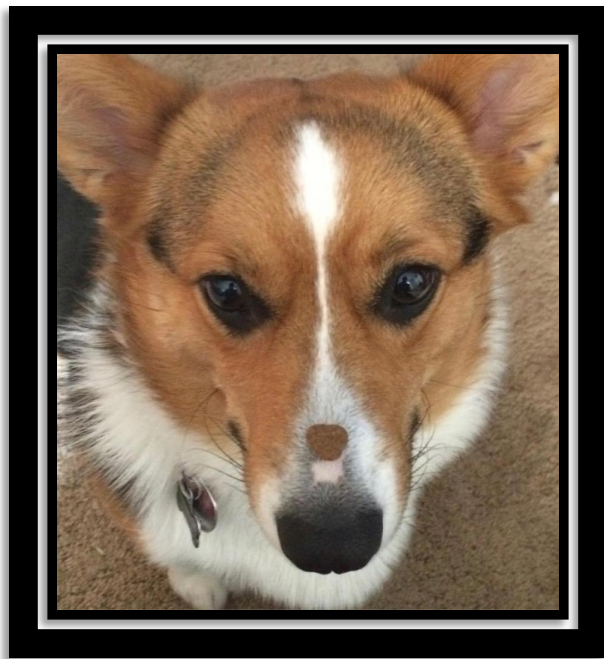
AUTOENCODERS



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

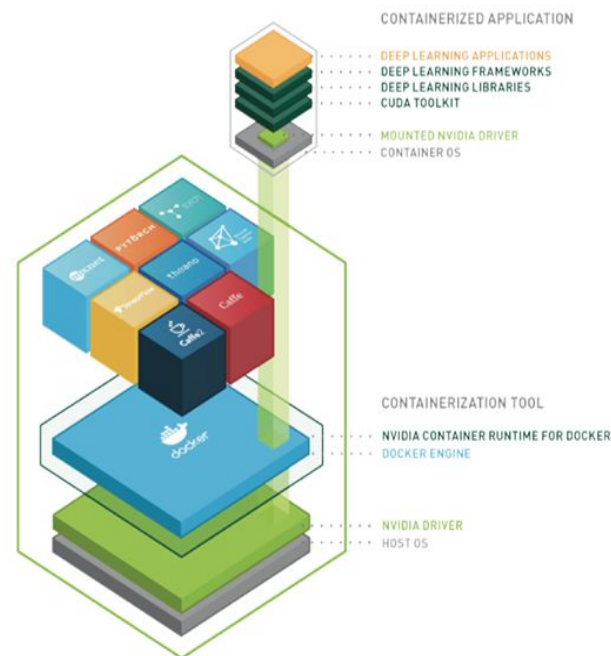
Designed for Enterprise & HPC

- 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



Riva

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

Step 3 Pull and Run Container

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



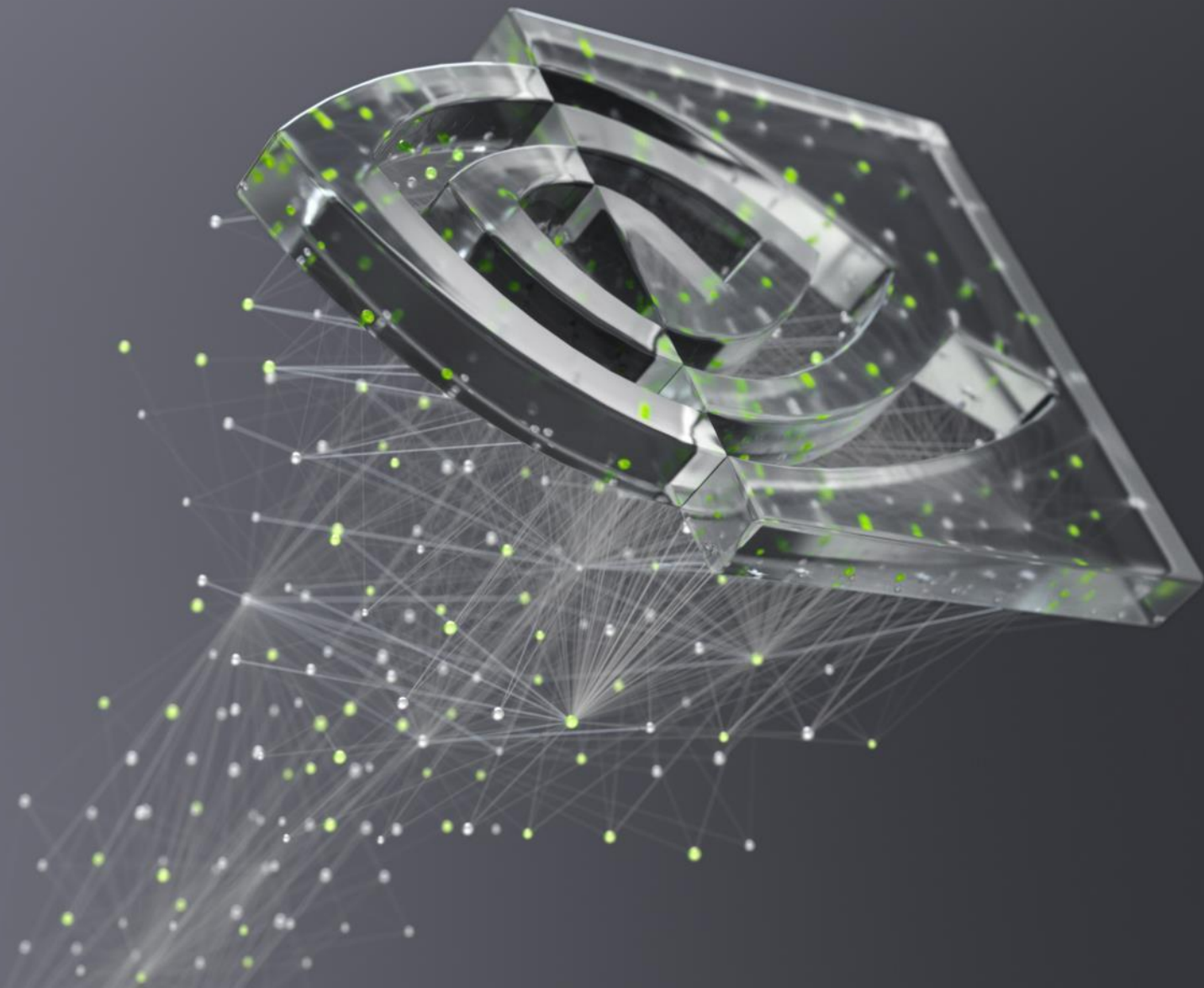
CLOSING THOUGHTS

COPYING ROCKET SCIENCE





LET'S GET STARTED!



DEEP
LEARNING
INSTITUTE