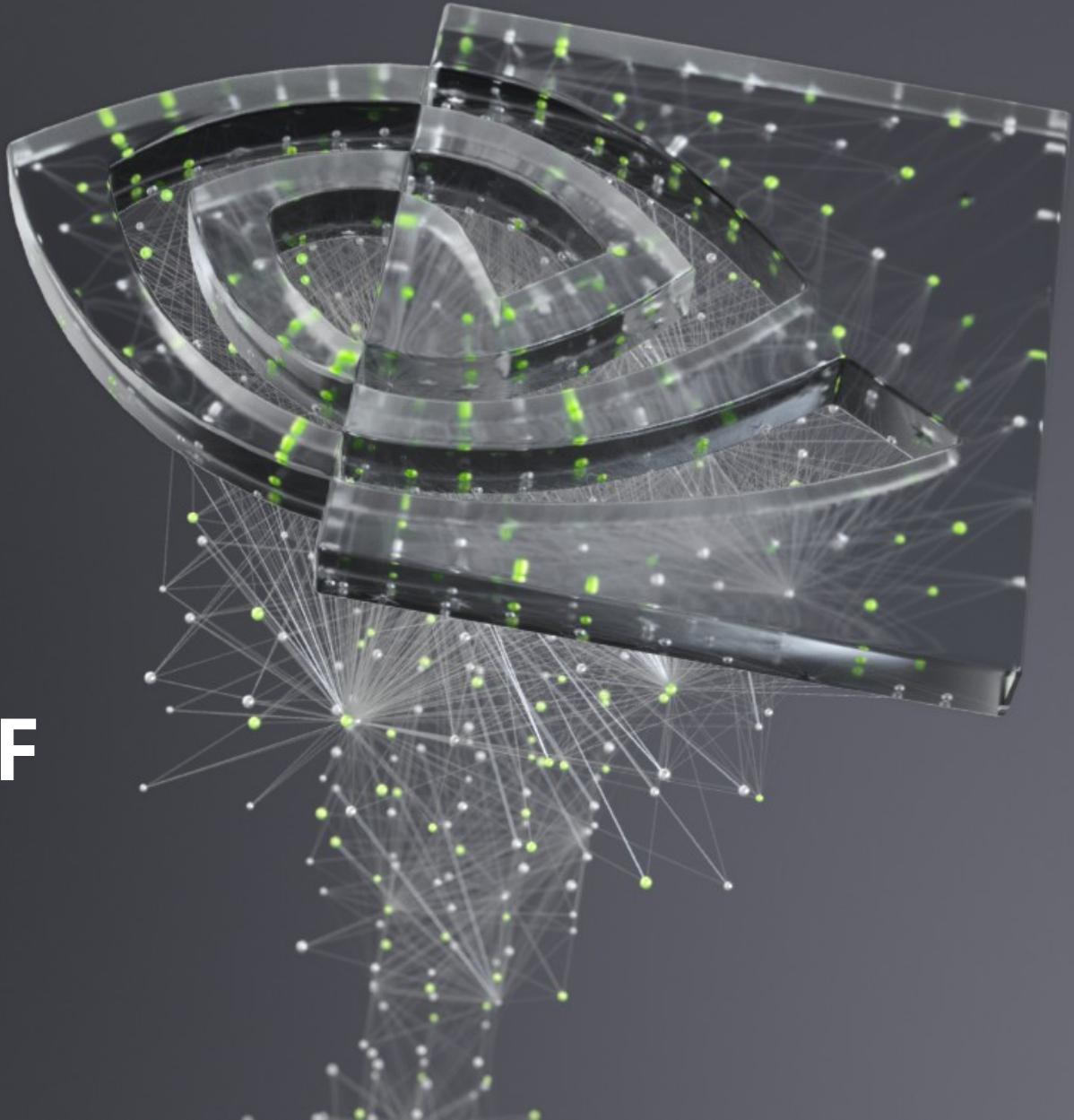




DEEP
LEARNING
INSTITUTE

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

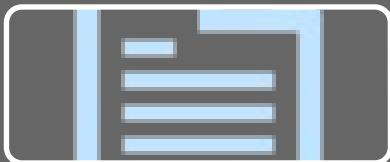
- Security
- Medicine

FIELDS OF AI



Computer Vision

- Optometry



Natural Language Processing

- Linguistics



Reinforcement Learning

- Game Theory
- Psychology



Anomaly Detection

- Security
- Medicine



A network graph visualization featuring numerous small, semi-transparent nodes scattered across a dark gray background. The nodes are colored in two shades: white and a bright lime green. They are interconnected by a dense web of thin, light gray lines, representing connections or relationships between the data points. The overall effect is one of complex connectivity and information flow.

NATURAL LANGUAGE PROCESSING

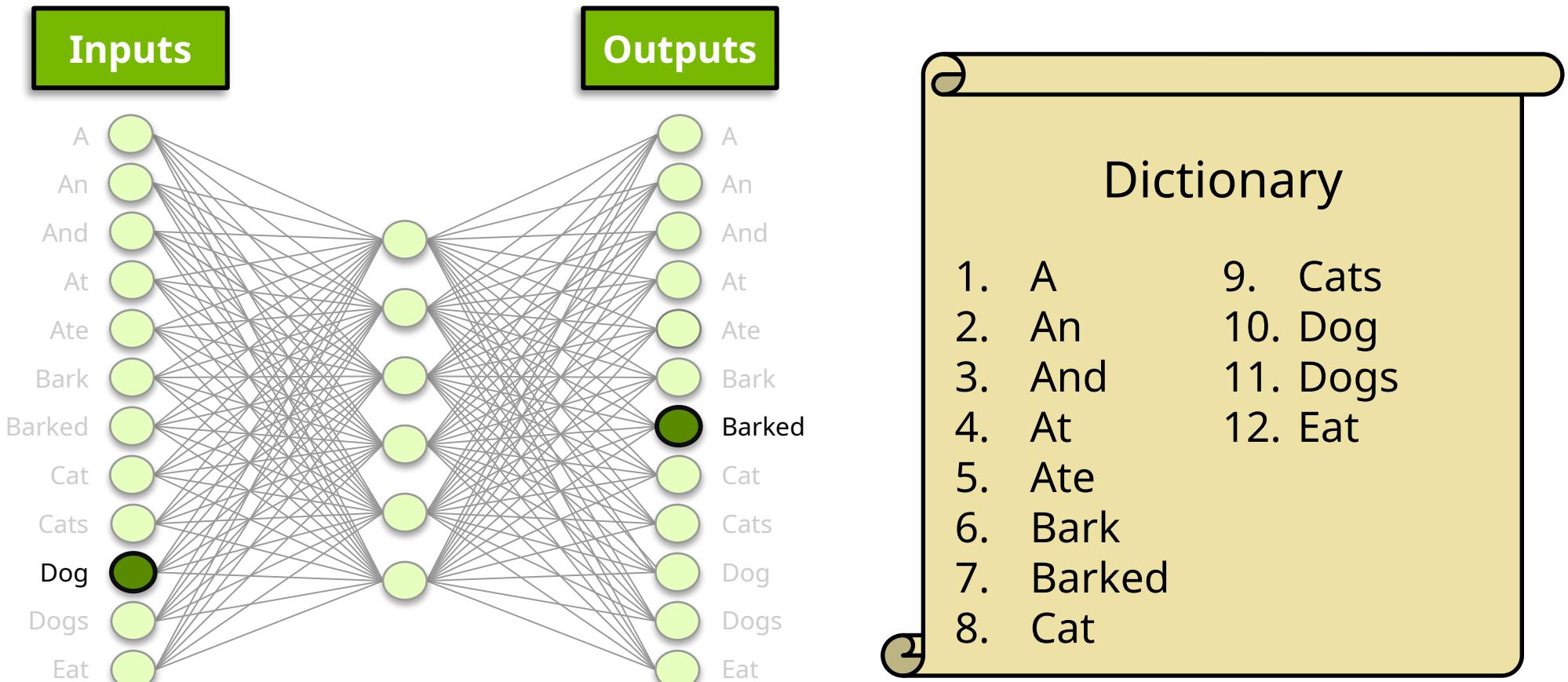
FROM WORDS TO NUMBERS

“A dog barked at a cat.”

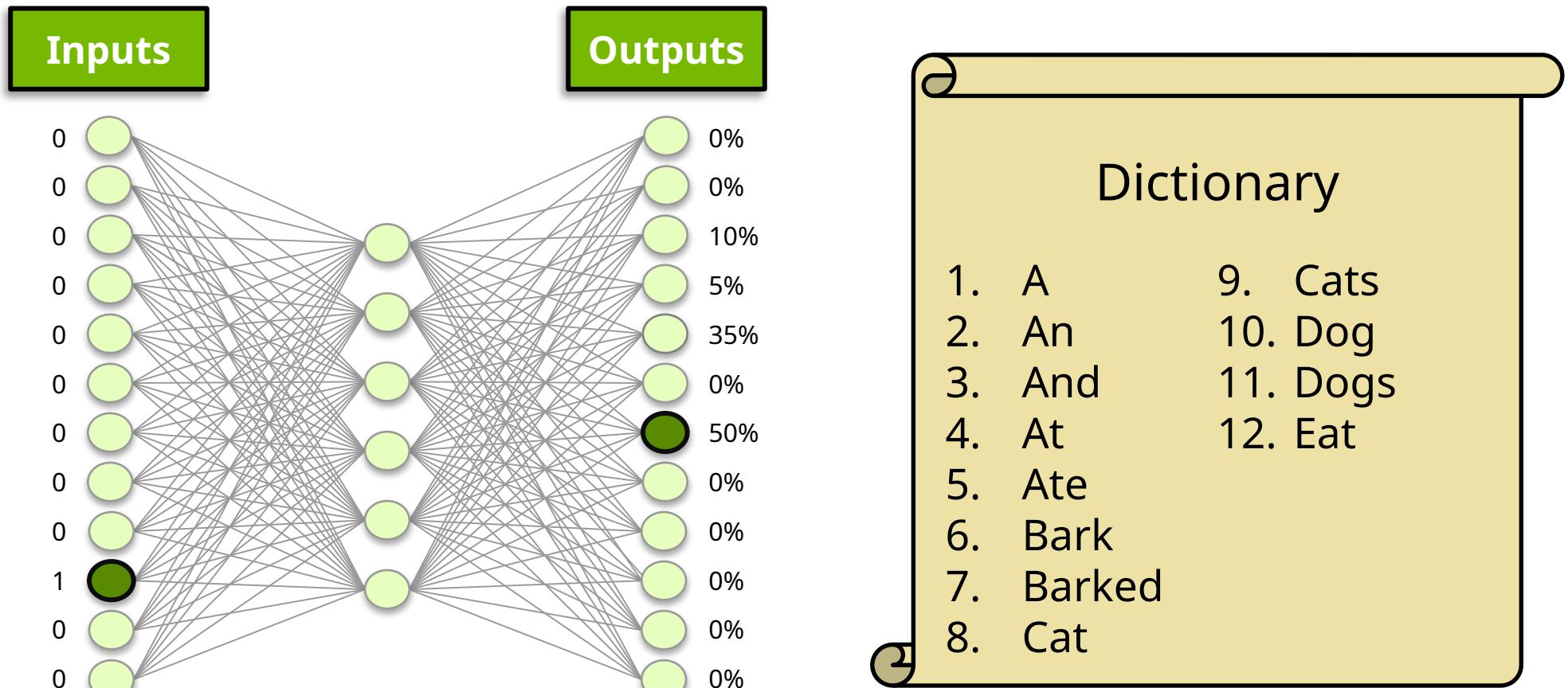
[1, 10, 7, 4, 1, 8]



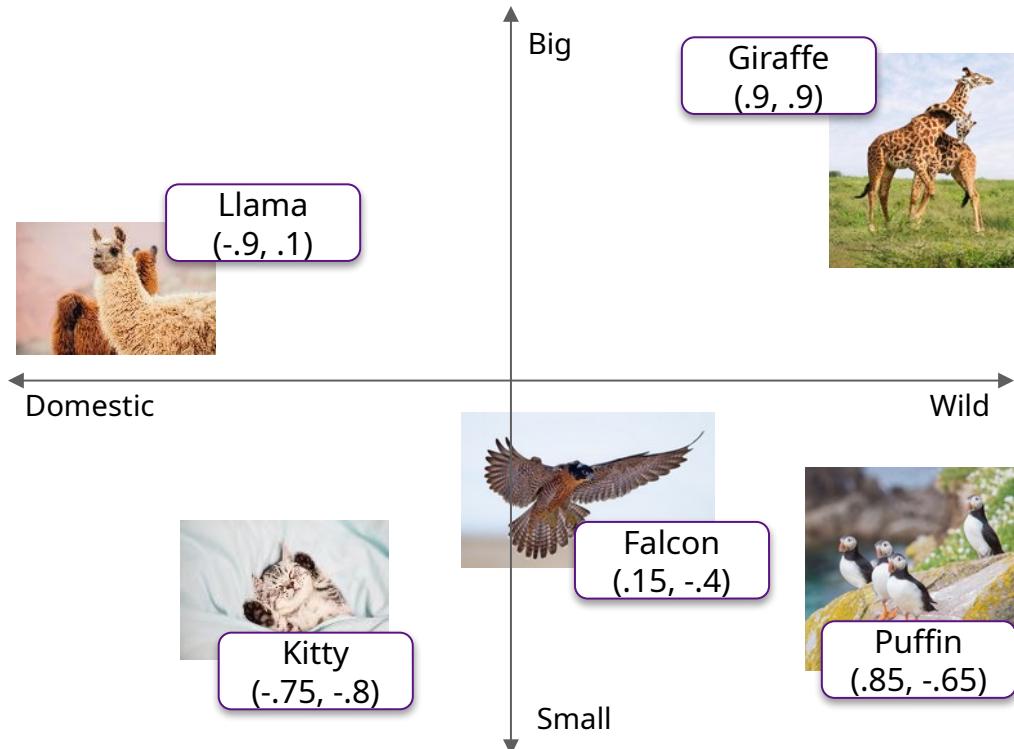
FROM WORDS TO NUMBERS



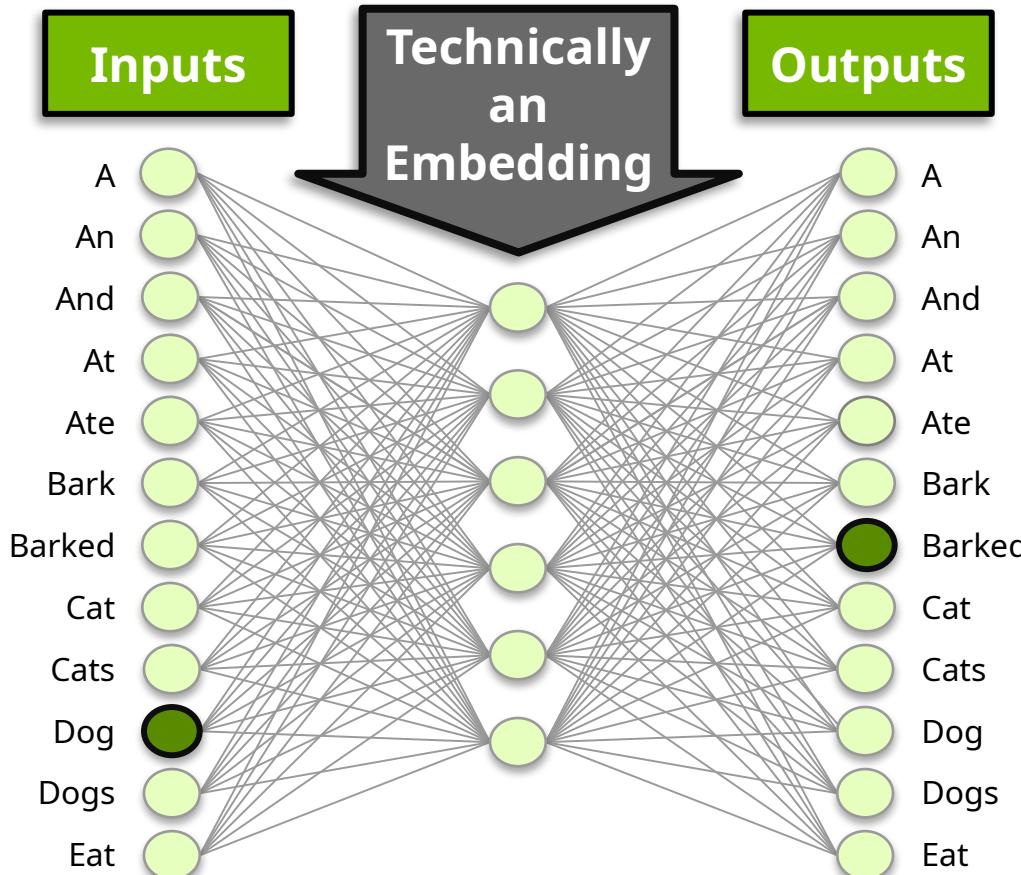
FROM WORDS TO NUMBERS



FROM WORDS TO NUMBERS



FROM WORDS TO NUMBERS





RECURRENT NEURAL NETWORKS

RECURRENT NEURAL NETWORKS

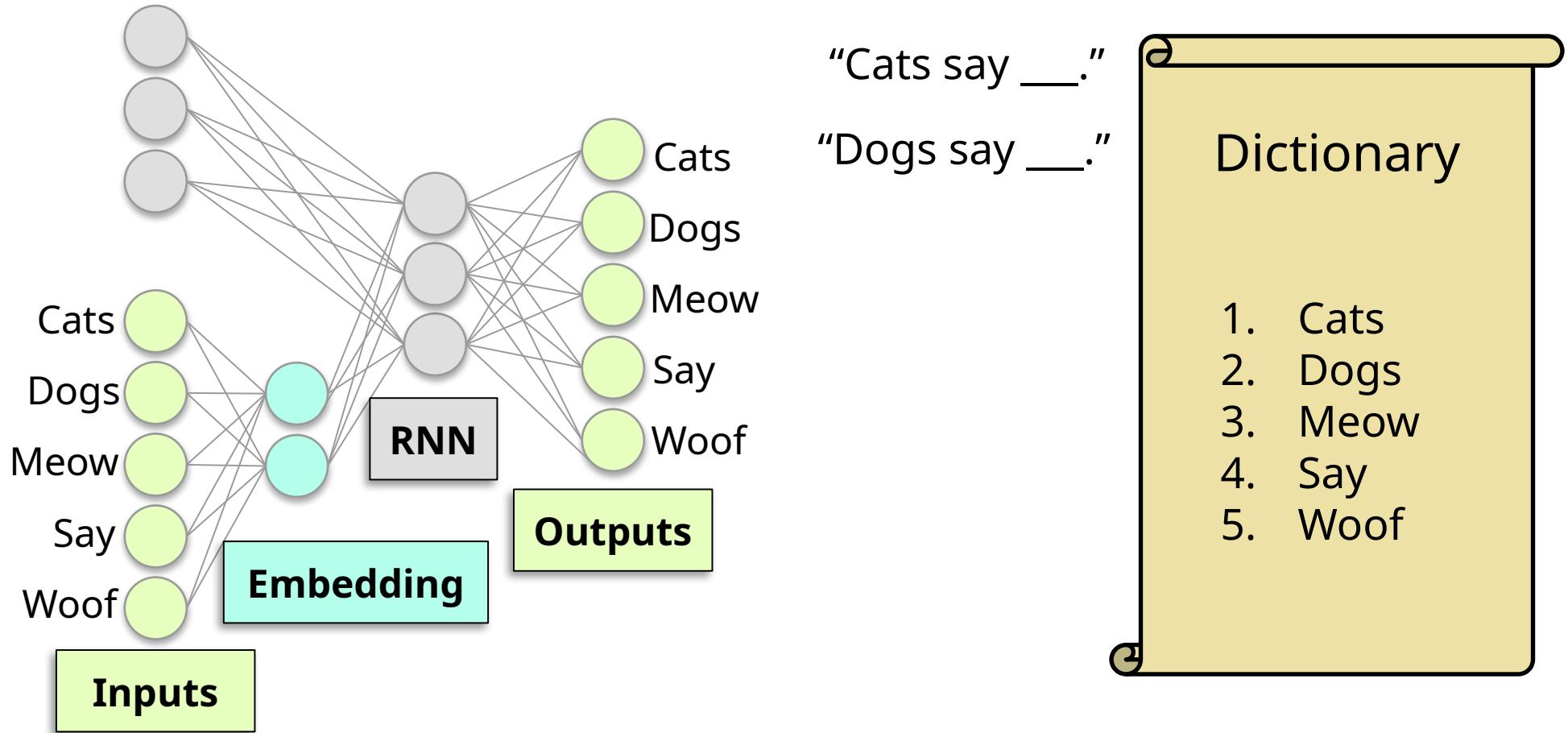
"Cats say ____."

"Dogs say ____."

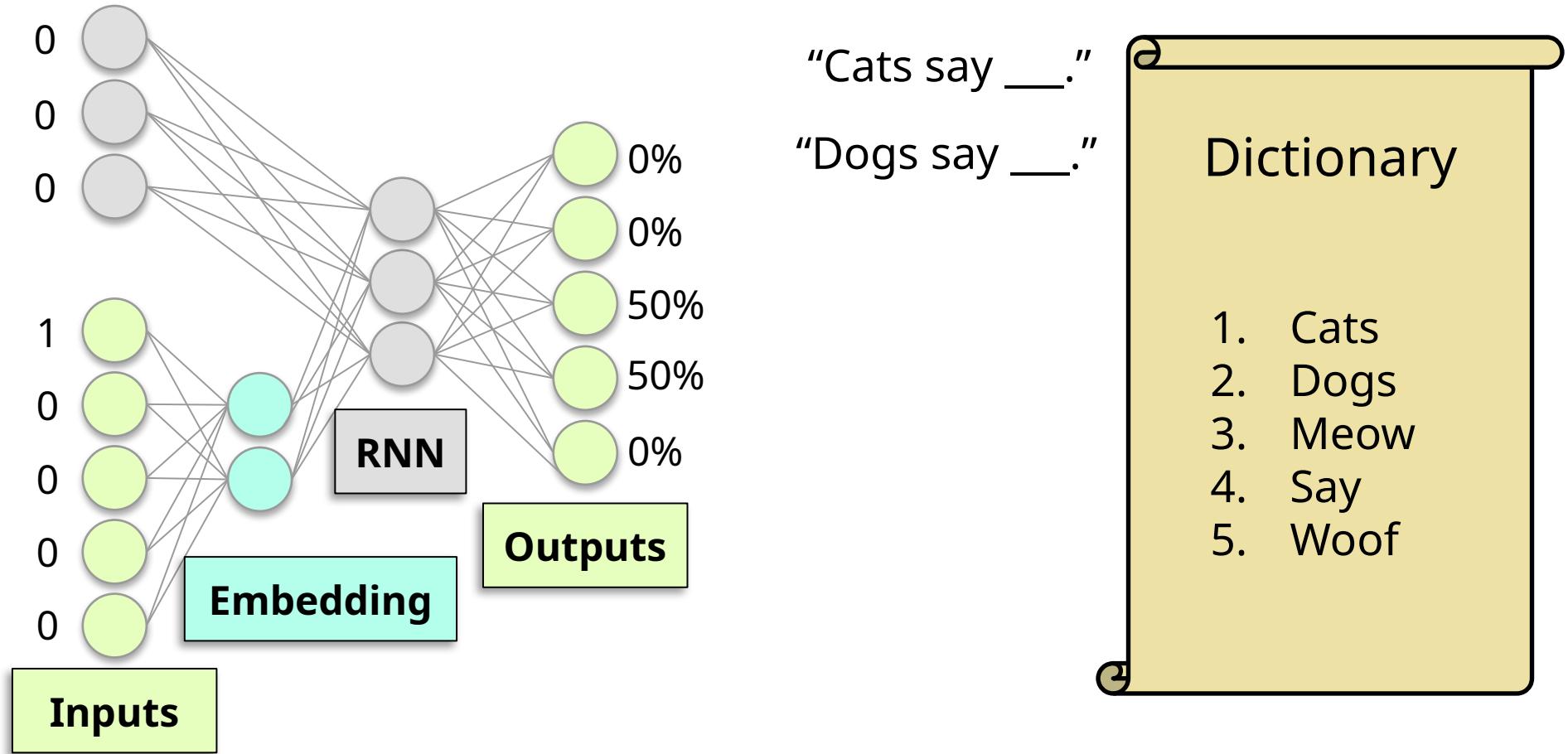
Dictionary

1. Cats
2. Dogs
3. Meow
4. Say
5. Woof

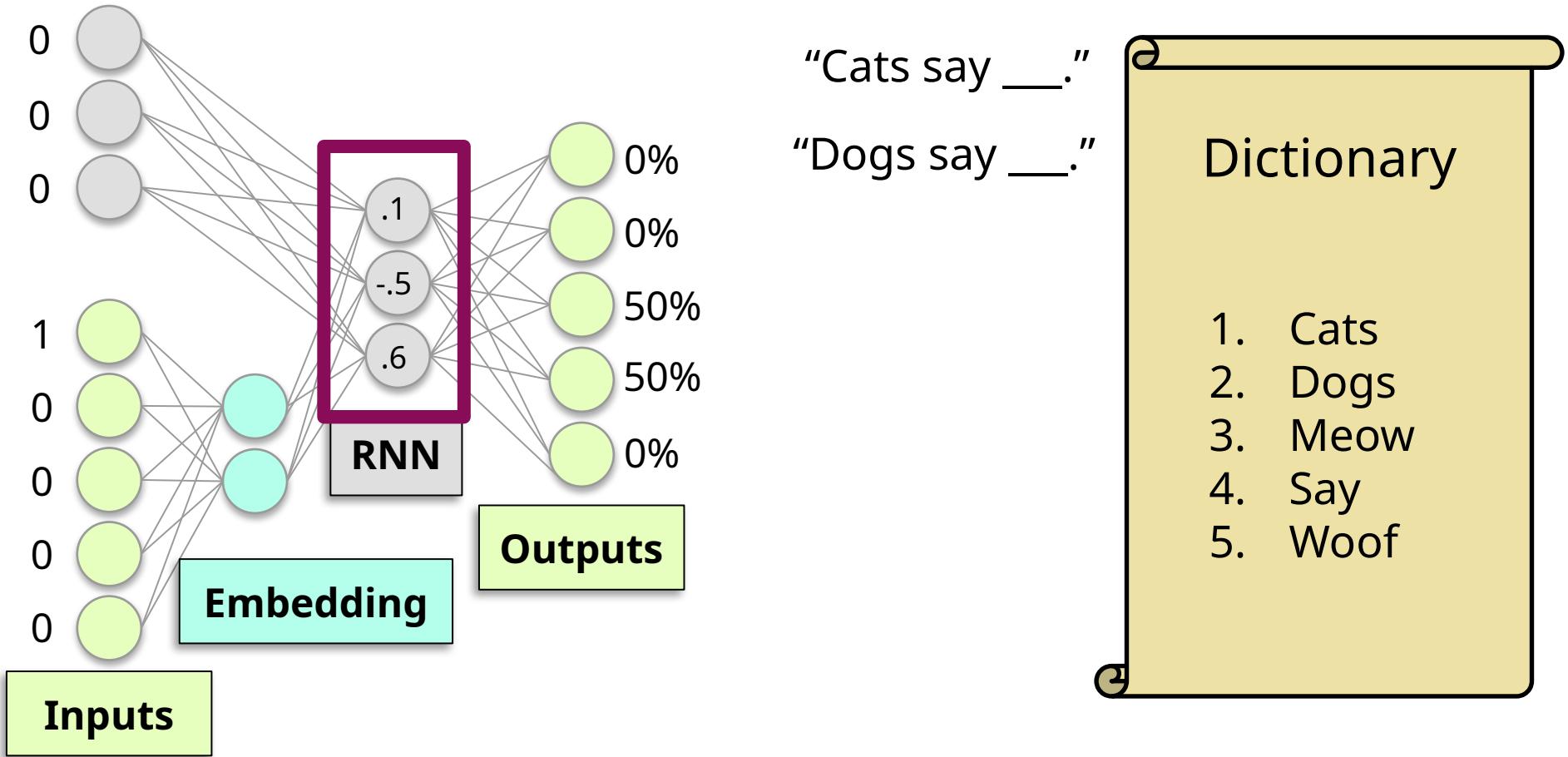
RECURRENT NEURAL NETWORKS



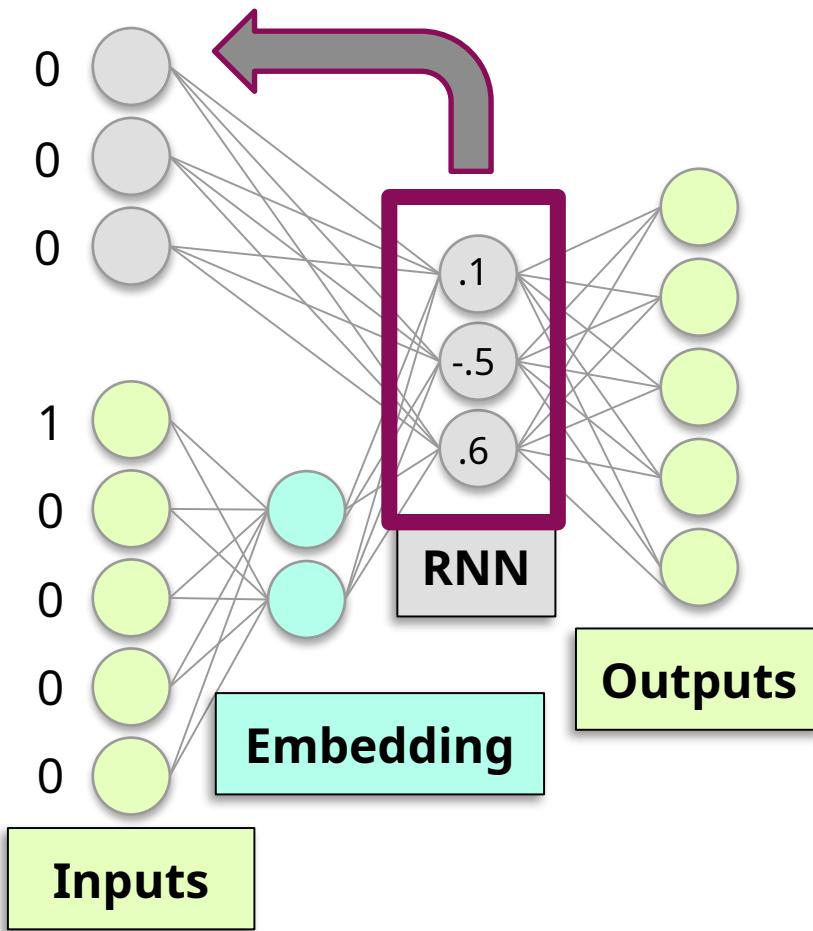
RECURRENT NEURAL NETWORKS



RECURRENT NEURAL NETWORKS



RECURRENT NEURAL NETWORKS

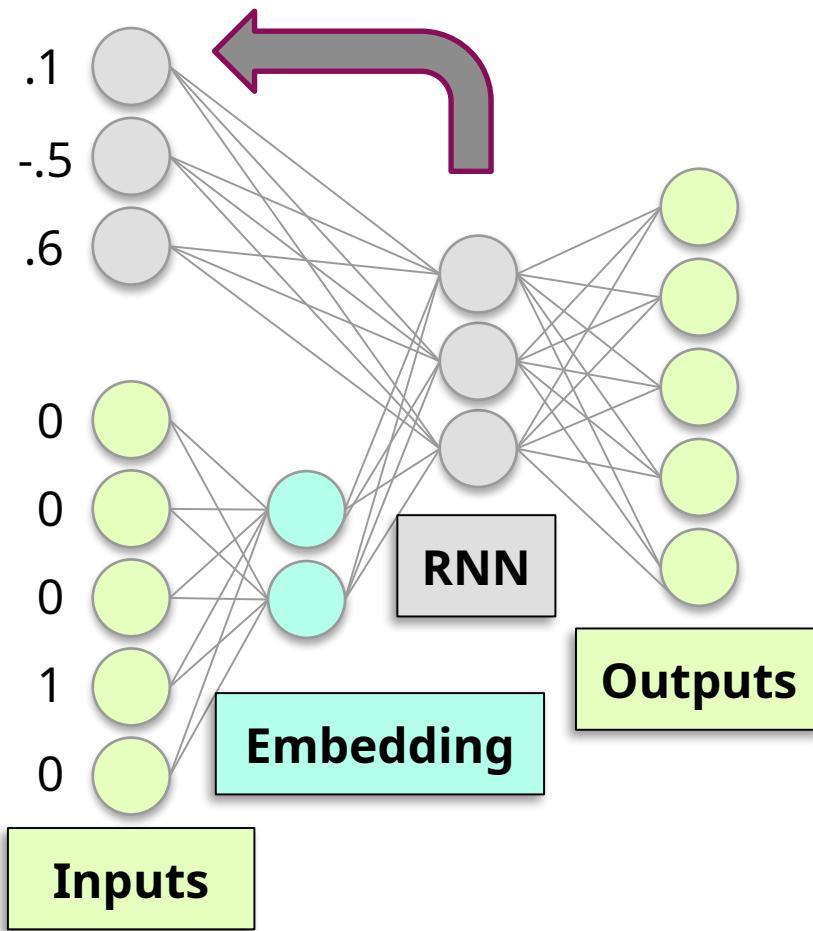


"Cats say ____."

"Dogs say ____."



RECURRENT NEURAL NETWORKS

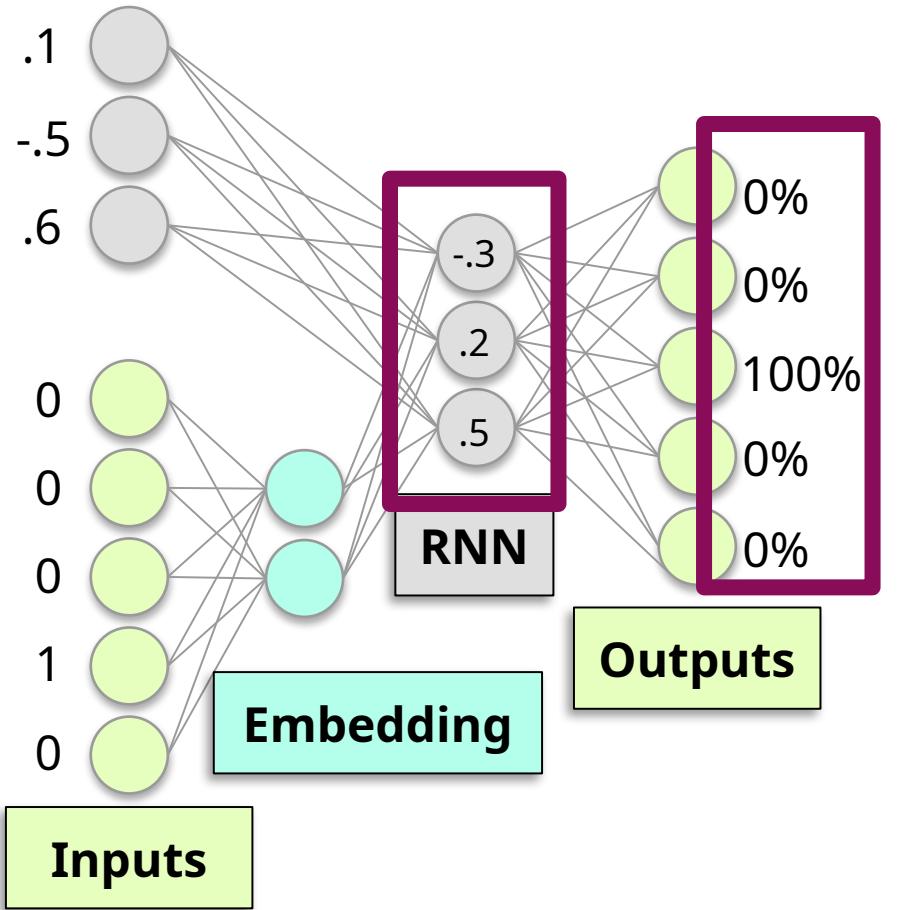


"Cats say ____."

"Dogs say ____."



RECURRENT NEURAL NETWORKS

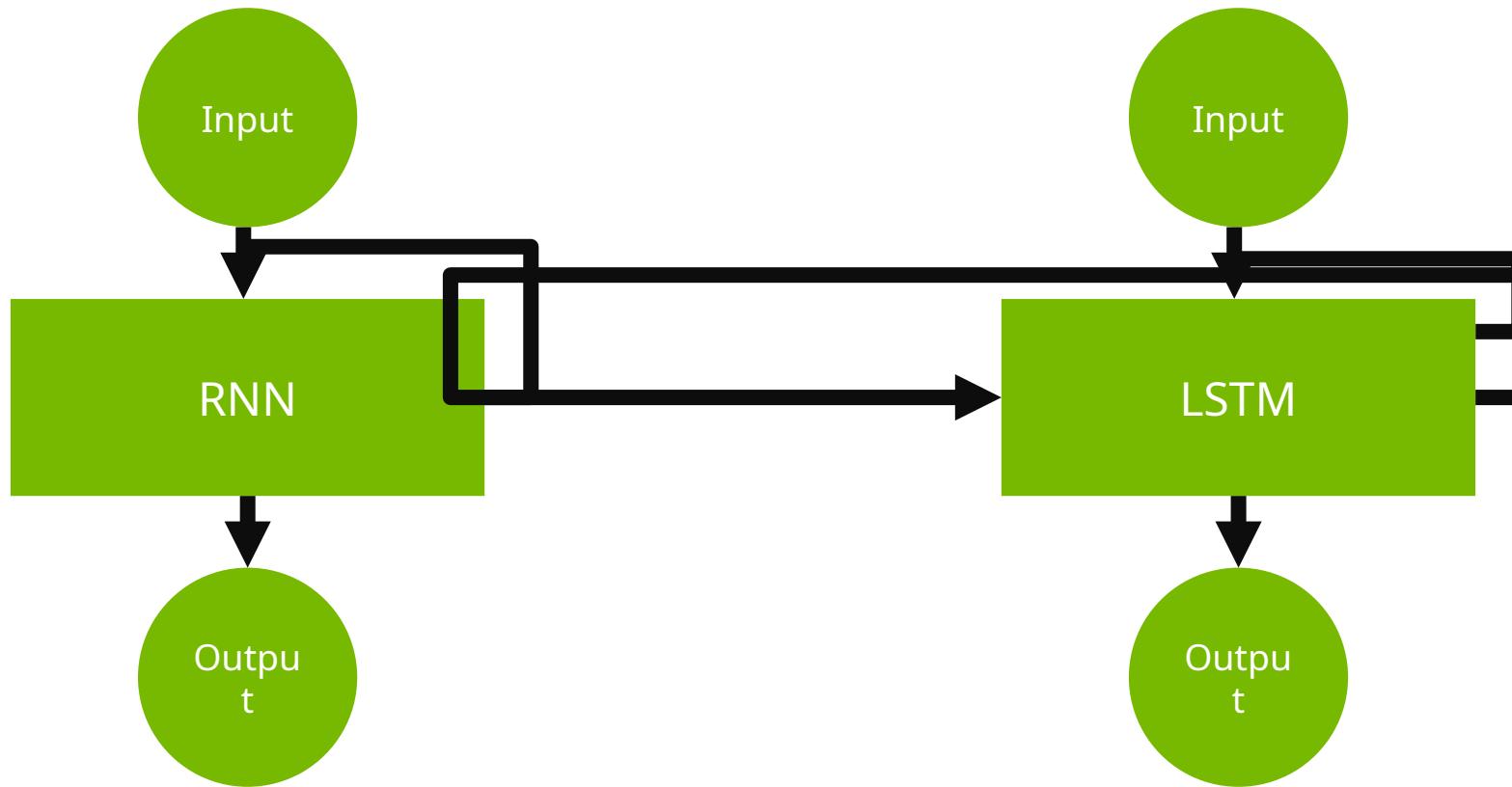


"Cats say ____."

"Dogs say ____."



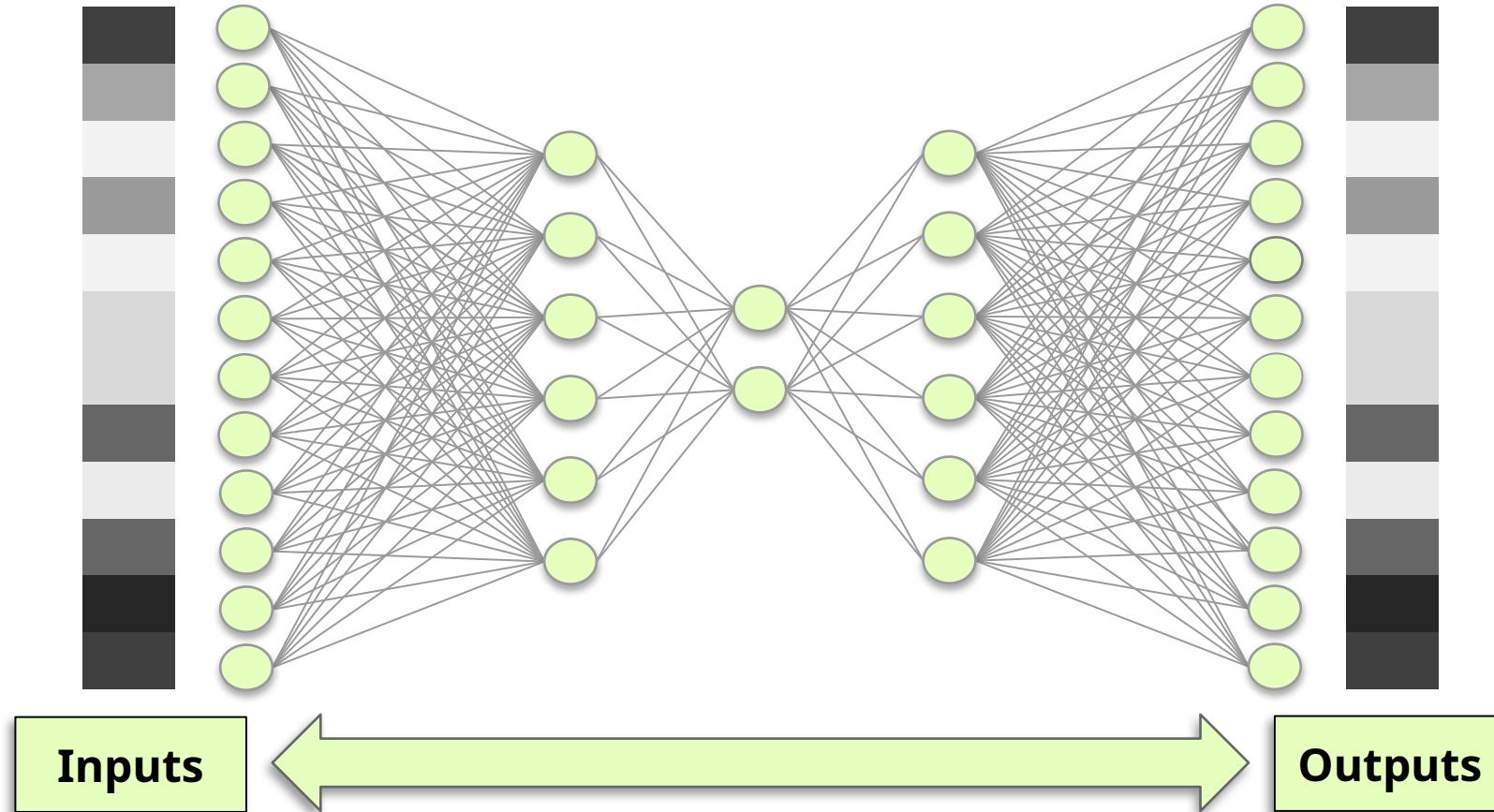
RECURRENT NEURAL NETWORKS



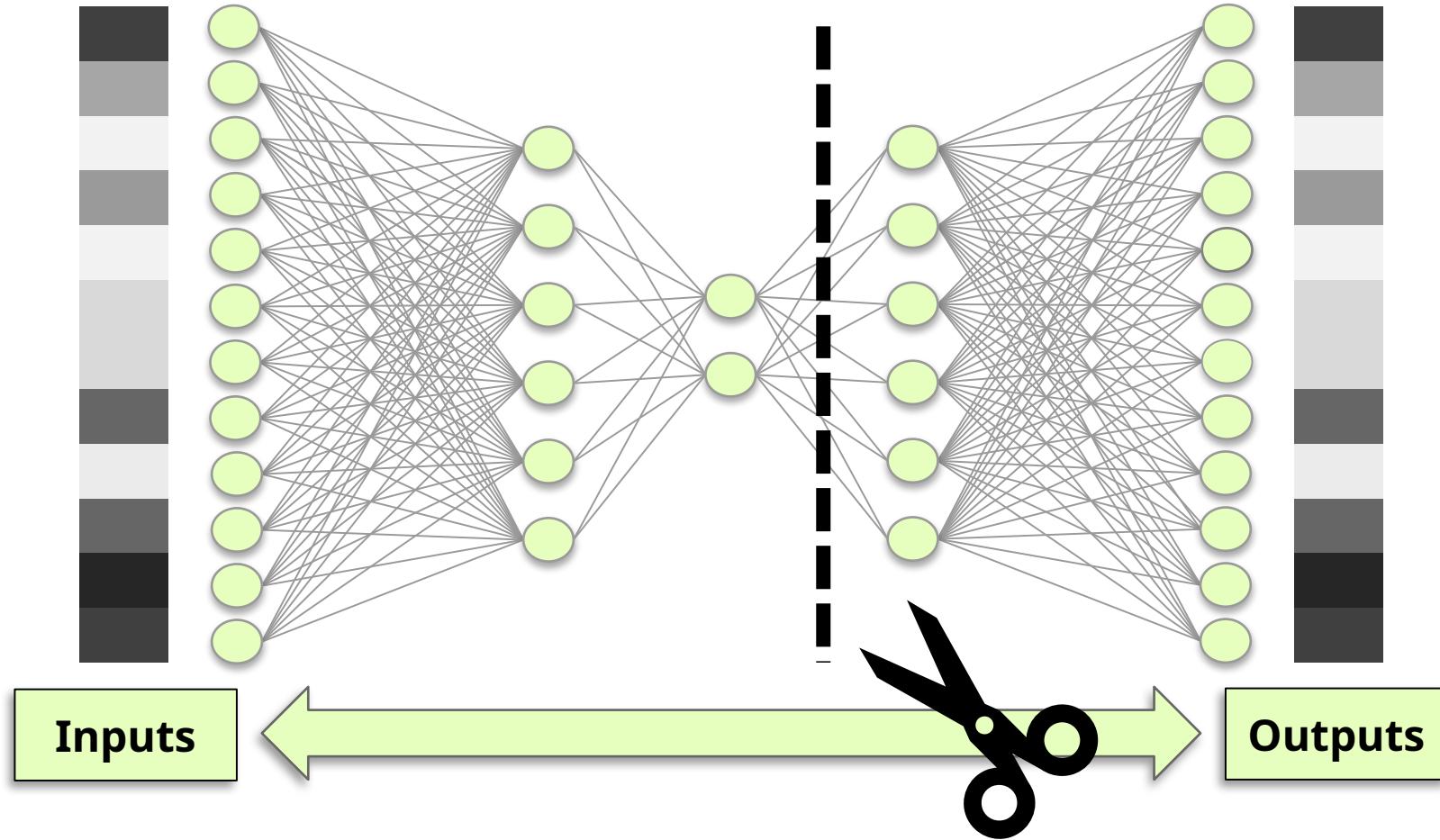


OTHER ARCHITECTURES

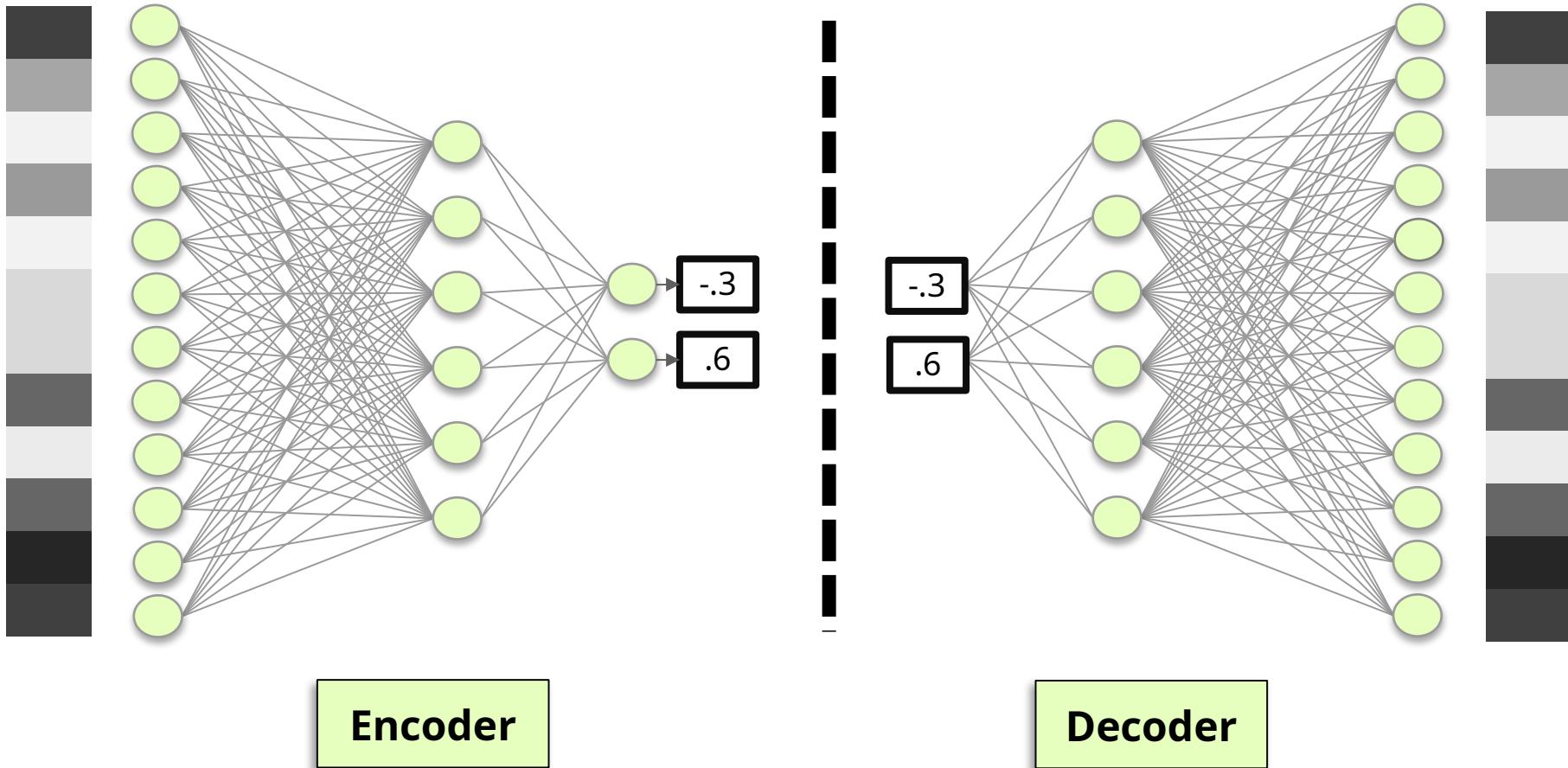
AUTOENCODERS



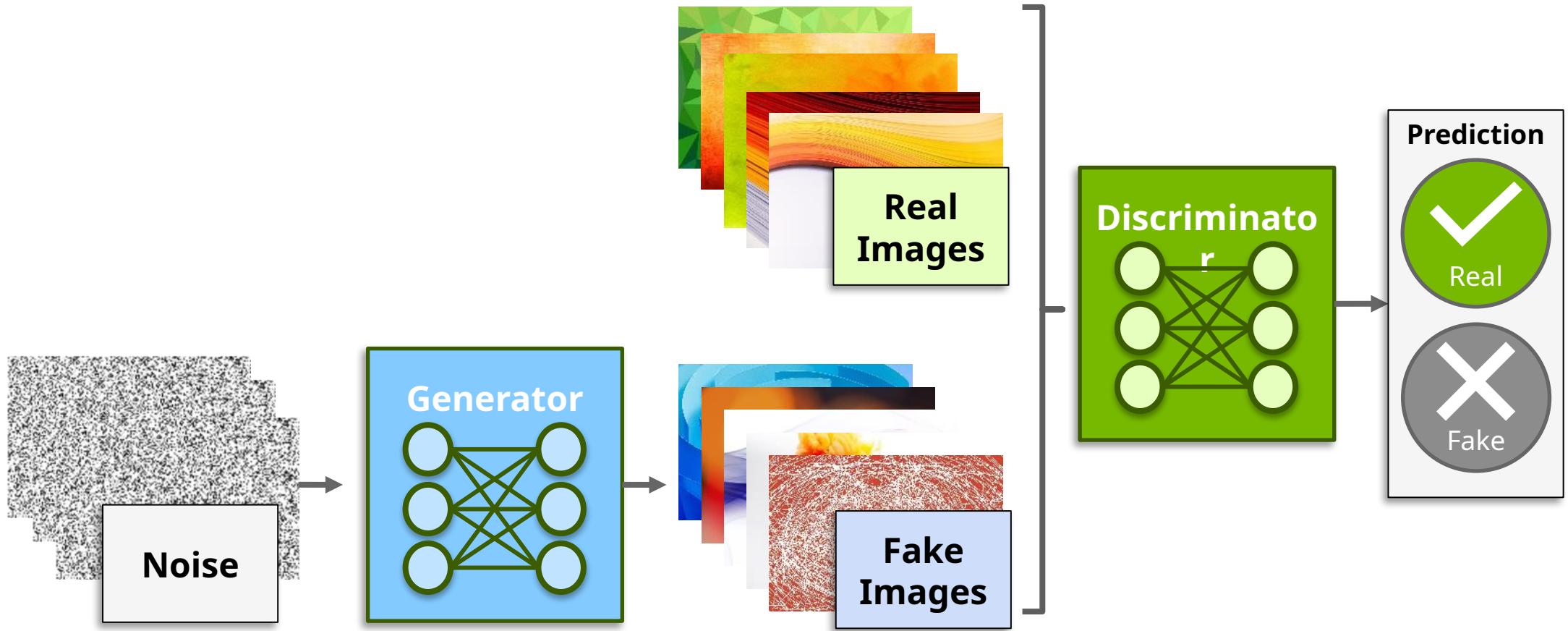
AUTOENCODERS



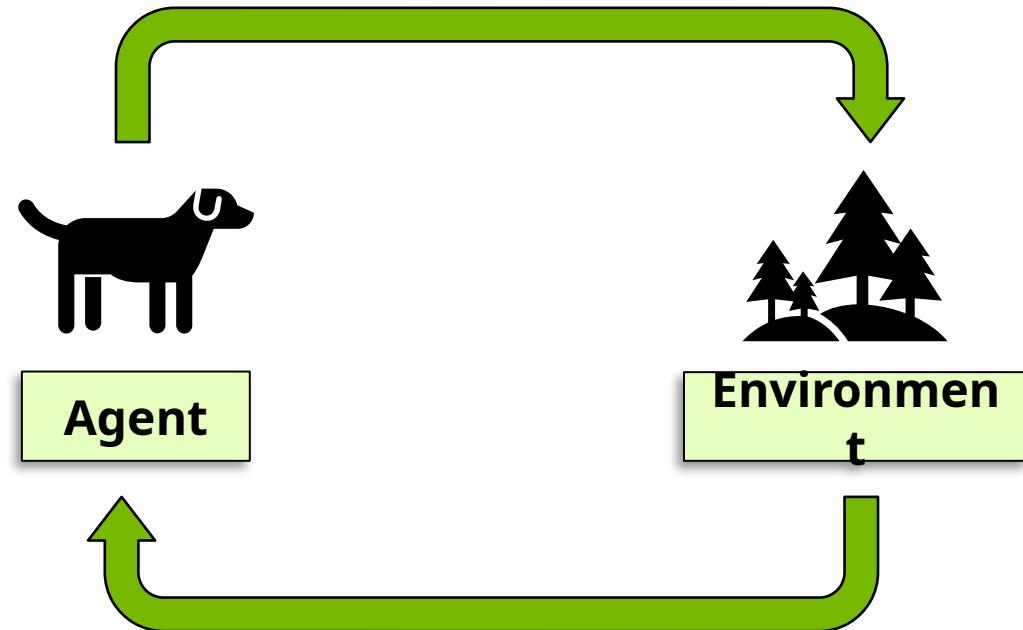
AUTOENCODERS



GENERATIVE ADVERSARIAL NETWORKS (GANS)



REINFORCEMENT LEARNING



A complex network graph is displayed against a dark gray background. The graph consists of numerous small white dots representing nodes, connected by thin gray lines representing edges. Interspersed among these are several larger, glowing green dots, which appear to be hubs or specific points of interest within the network. The overall effect is one of a dense, interconnected system.

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

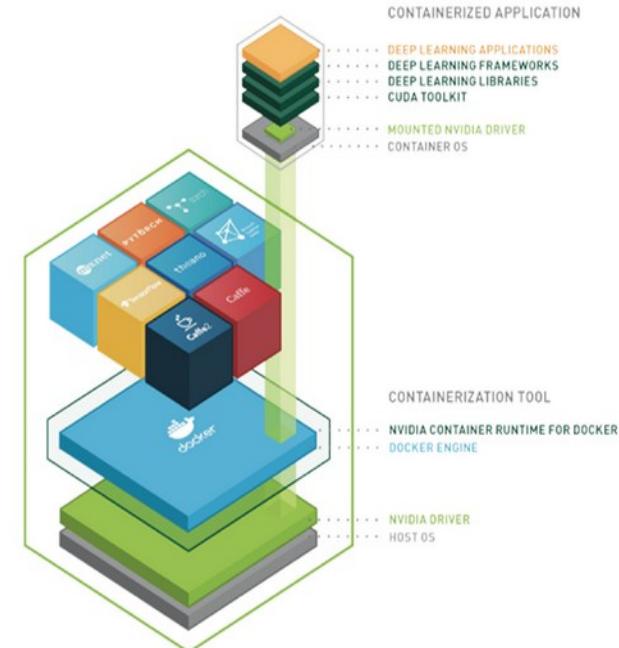
Designed for Enterprise & HPC

- Supports Docker, Singularity & other runtimes

Run Anywhere

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

NGC Deep Learning Containers



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

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



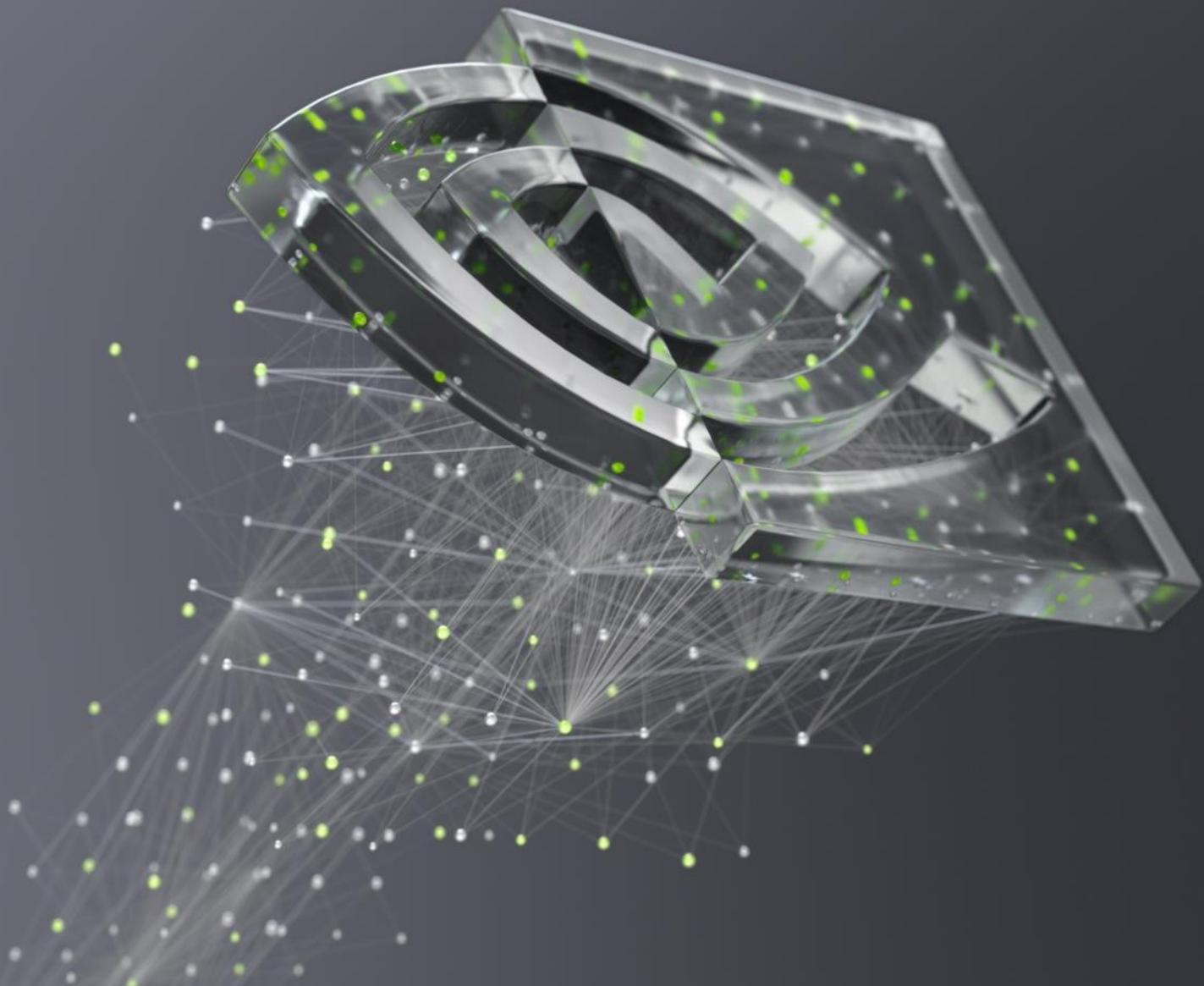
CLOSING THOUGHTS

COPYING ROCKET SCIENCE





LET'S GET STARTED!



DEEP
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