

# CHAPTER 5

Supervised Deep Learning for Secure Internet of Things



Input

0	1	2
3	4	5
6	7	8

\*

Kernel

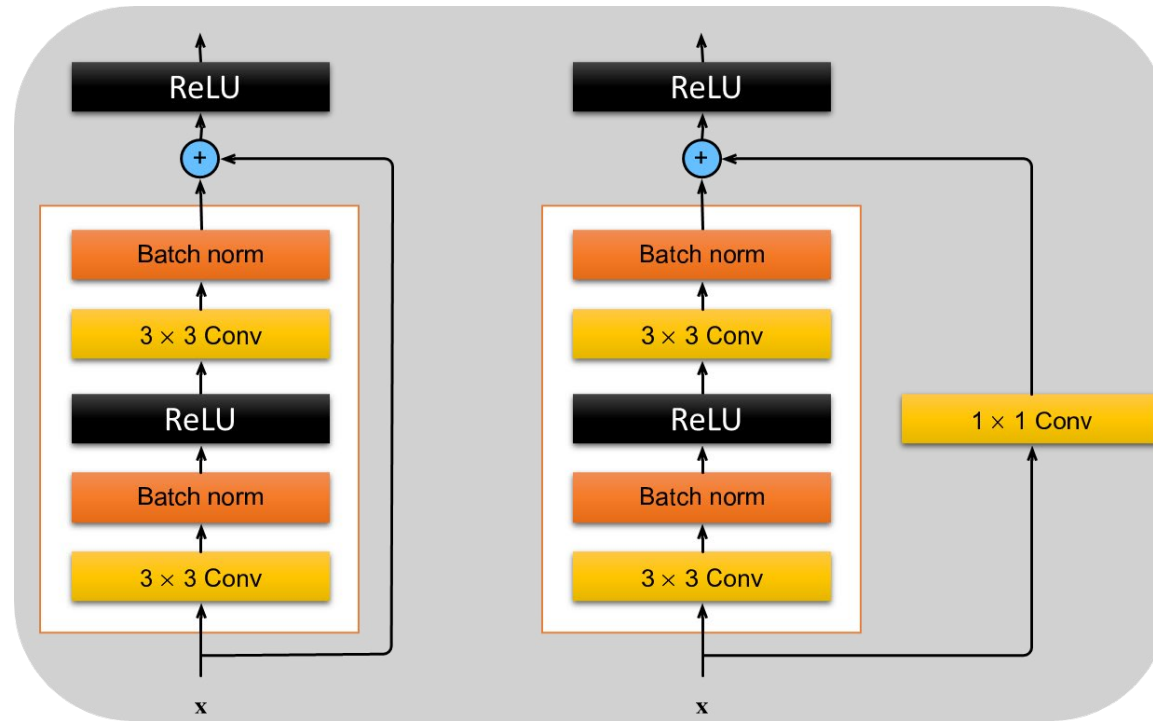
0	1
2	3

=

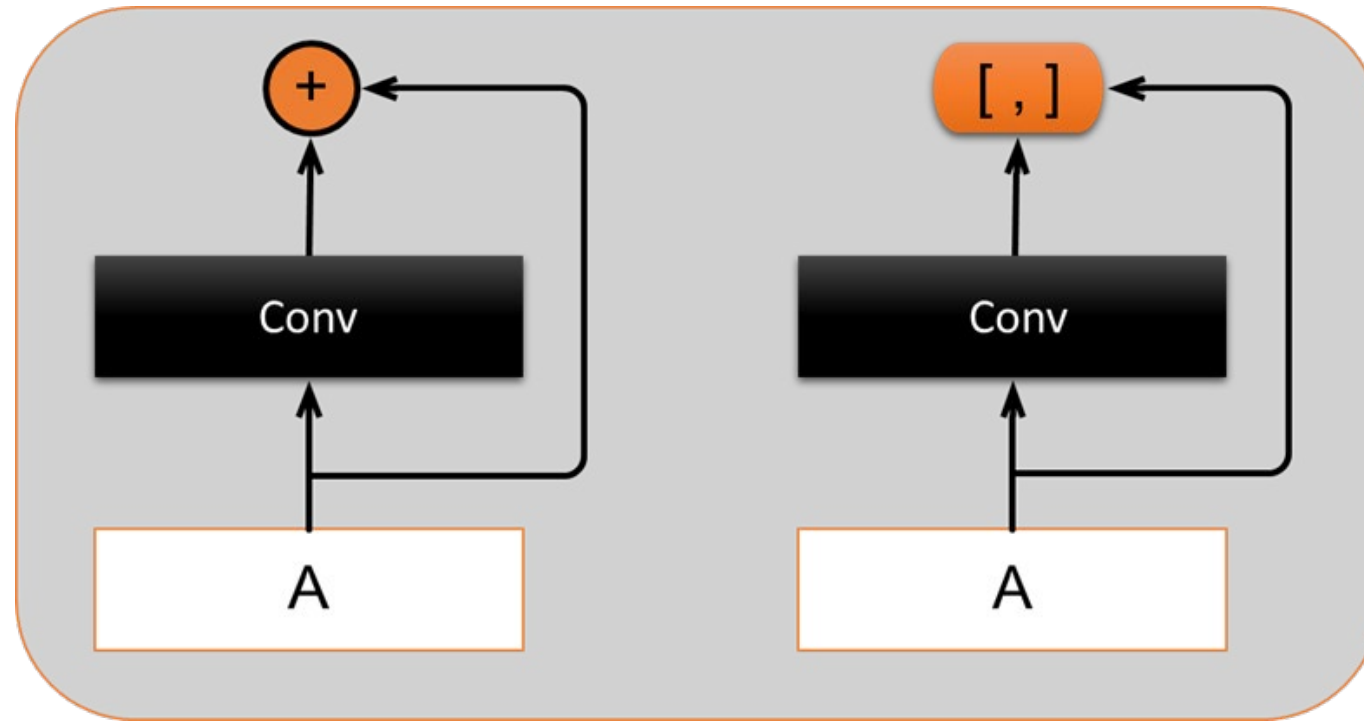
Output

19	25
37	43

**CONVOLUTIONAL NEURAL NETWORK**

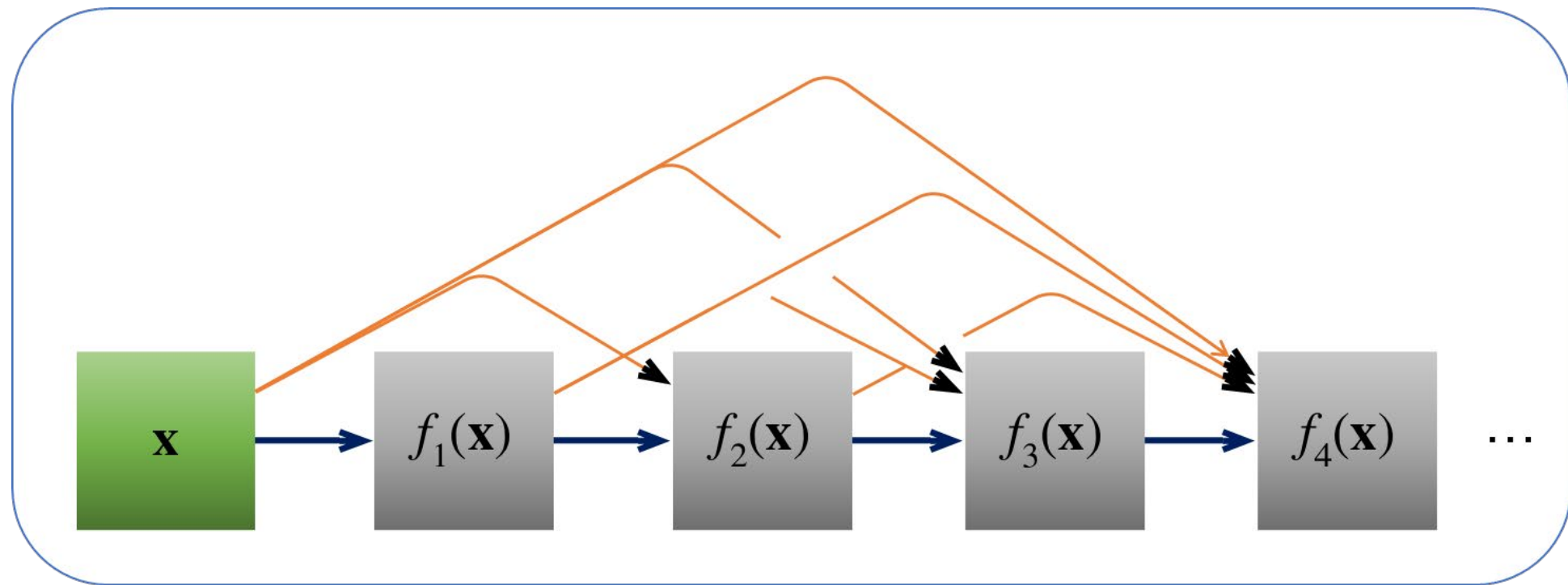


# ADVANCED CONVOLUTIONAL NEURAL NETWORK

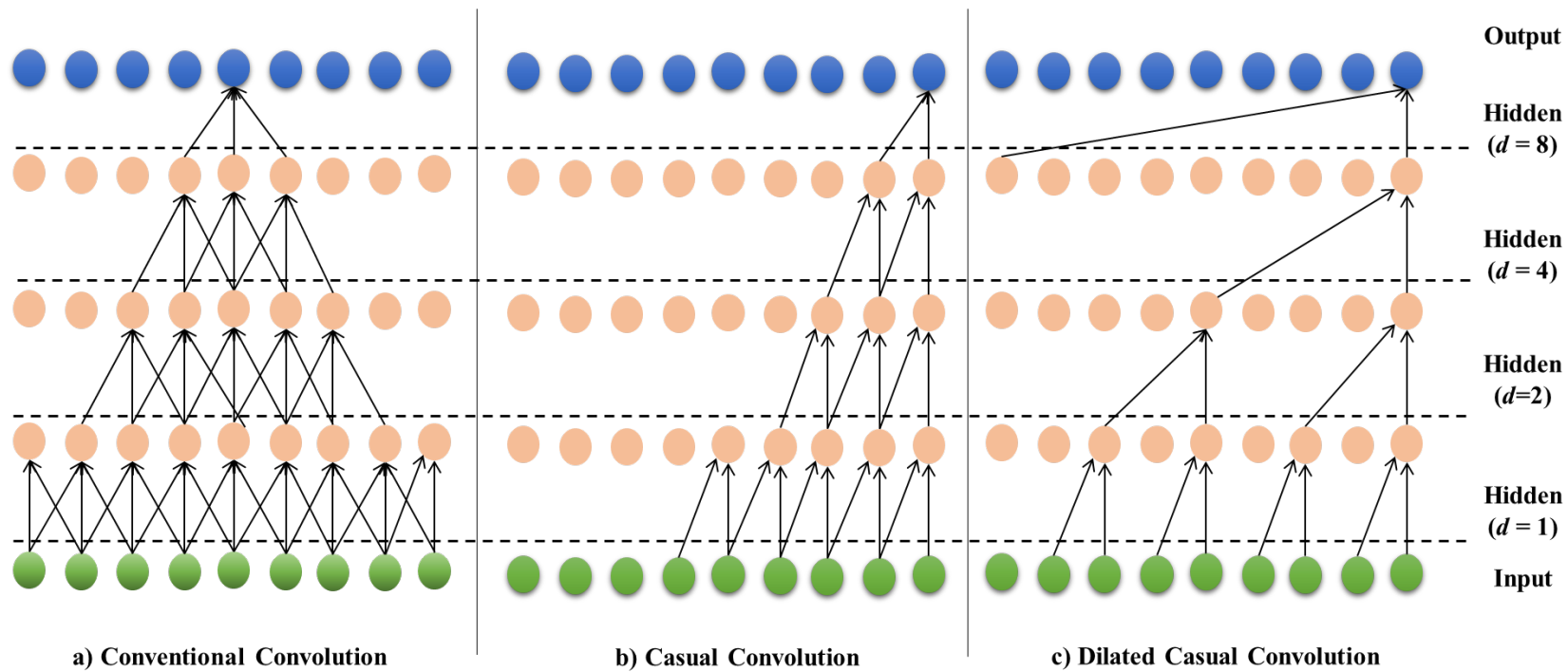


# ADVANCED CONVOLUTIONAL NEURAL NETWORK



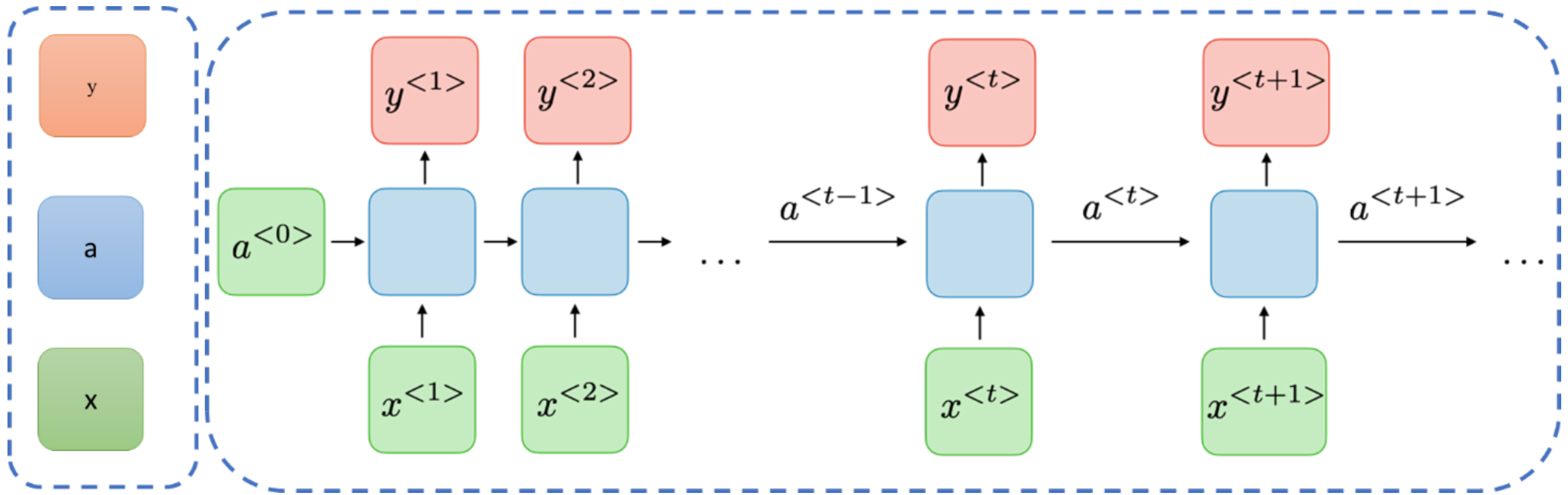


# ADVANCED CONVOLUTIONAL NEURAL NETWORK

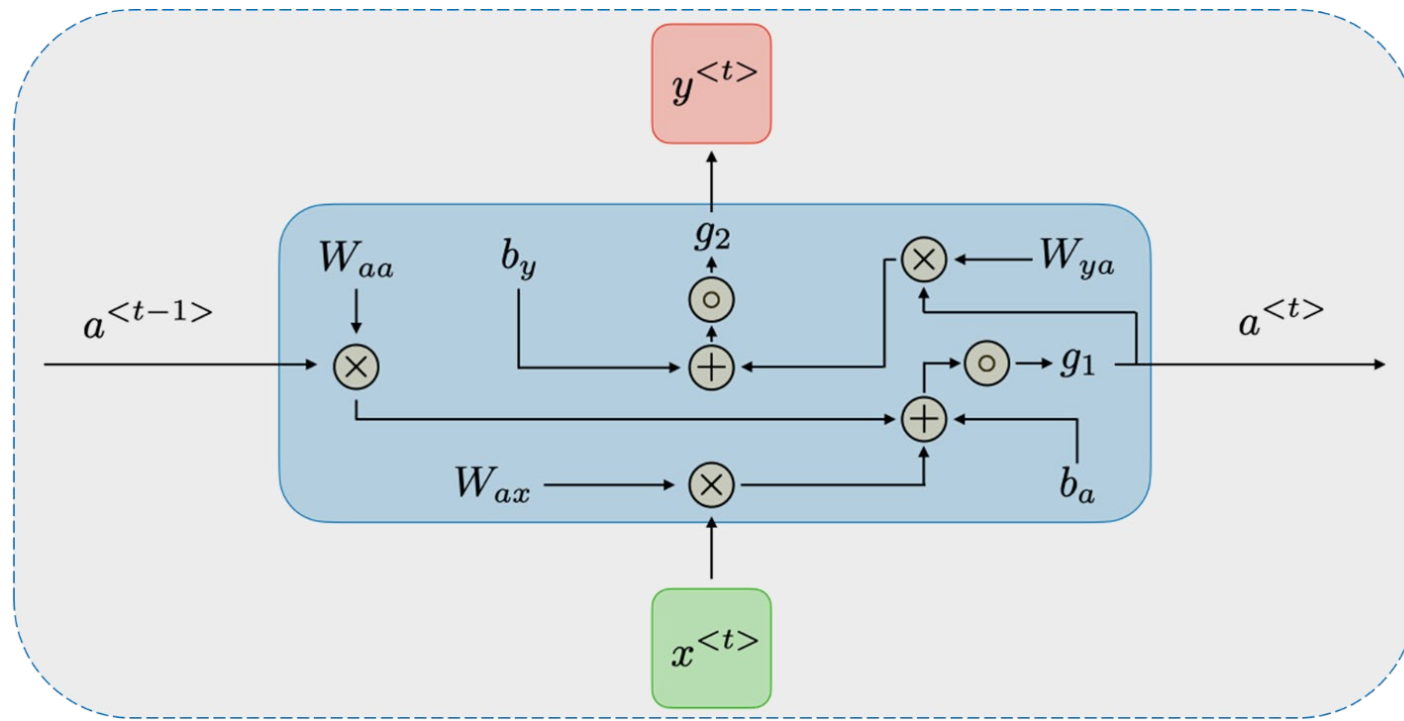


# TEMPORAL CONVOLUTIONAL NEURAL NETWORK



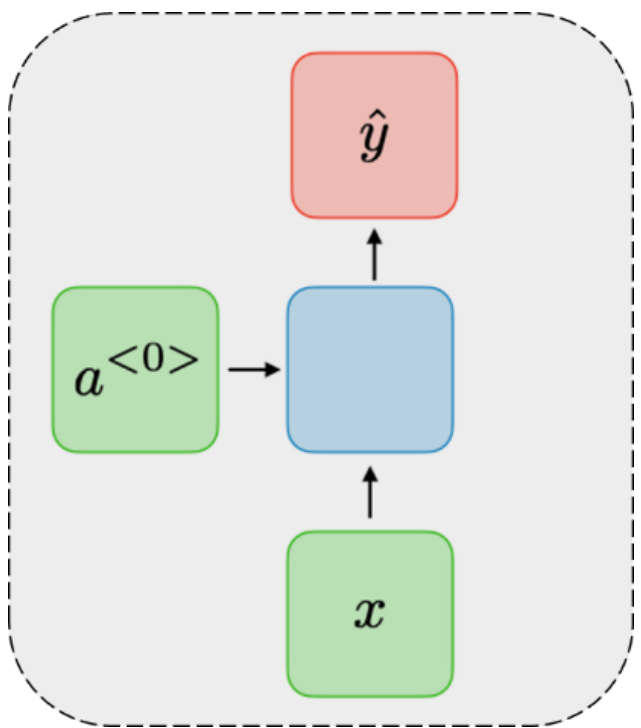


# RECURRENT NEURAL NETWORKS

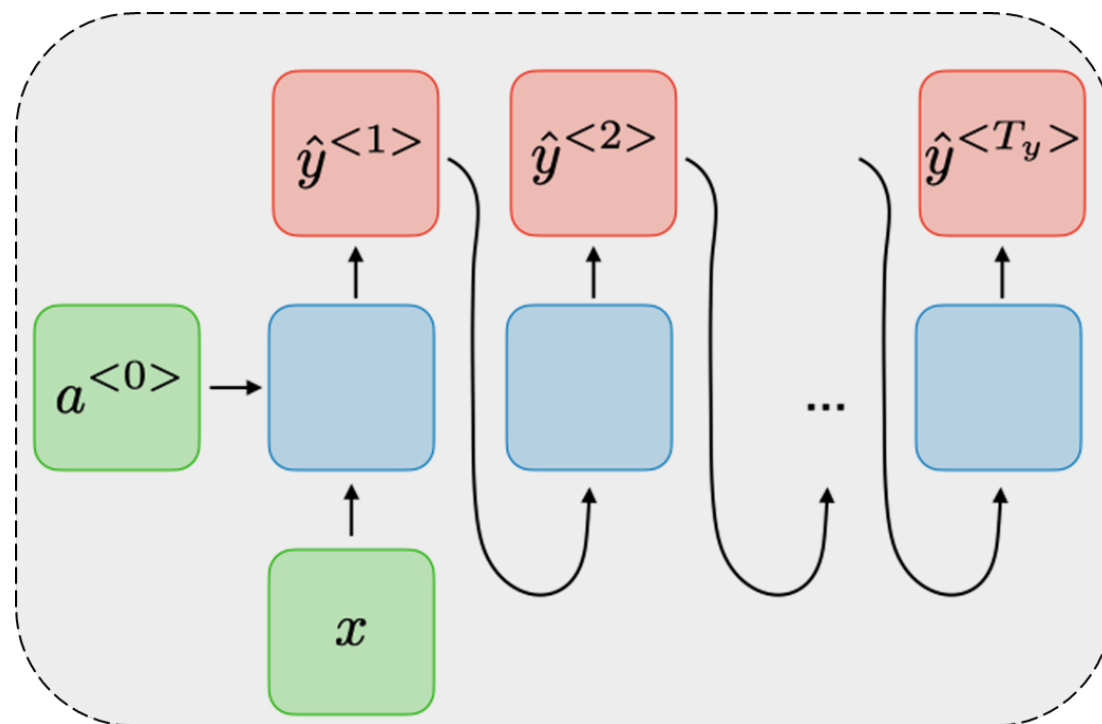


# RECURRENT NEURAL NETWORKS



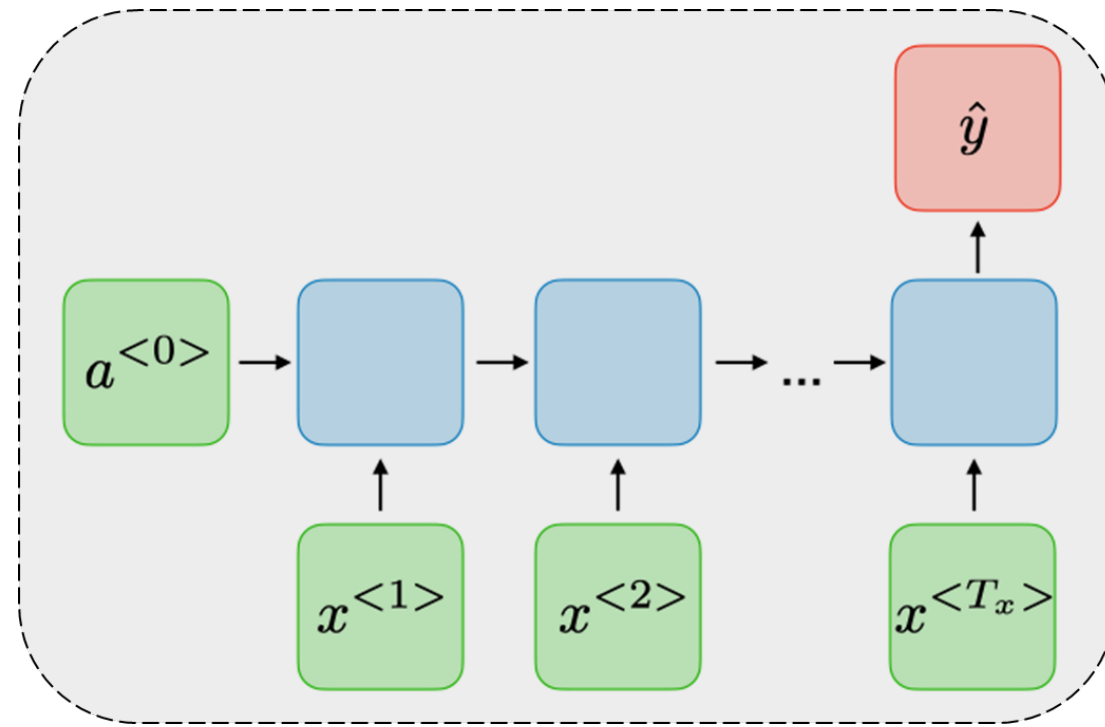


# RECURRENT NEURAL NETWORKS

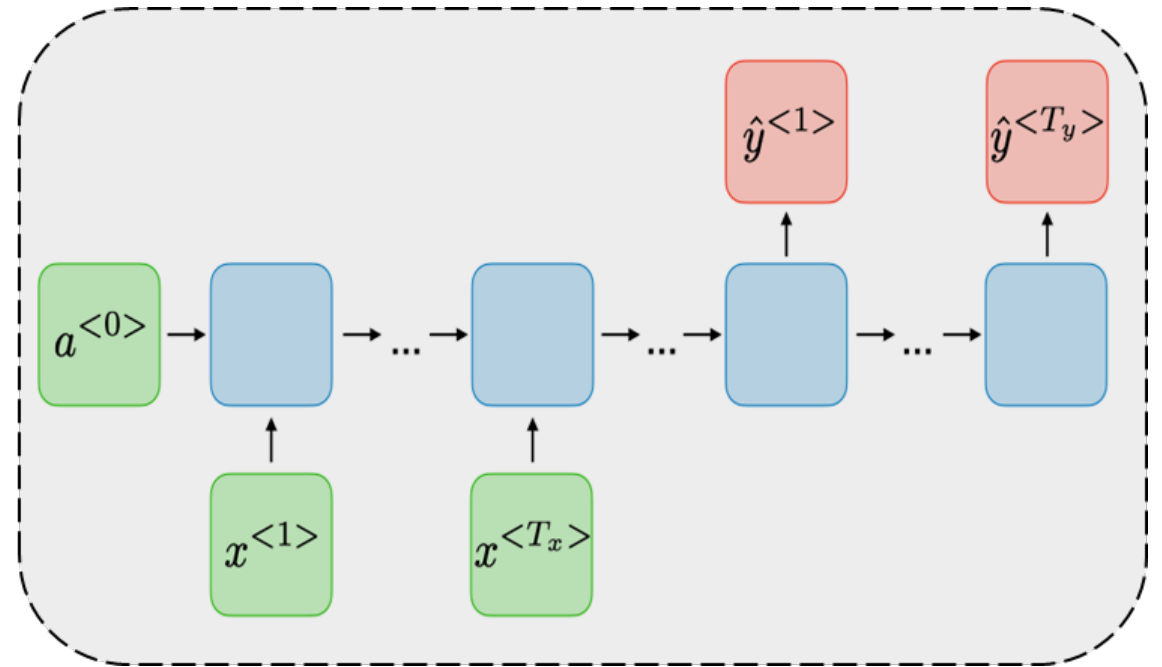
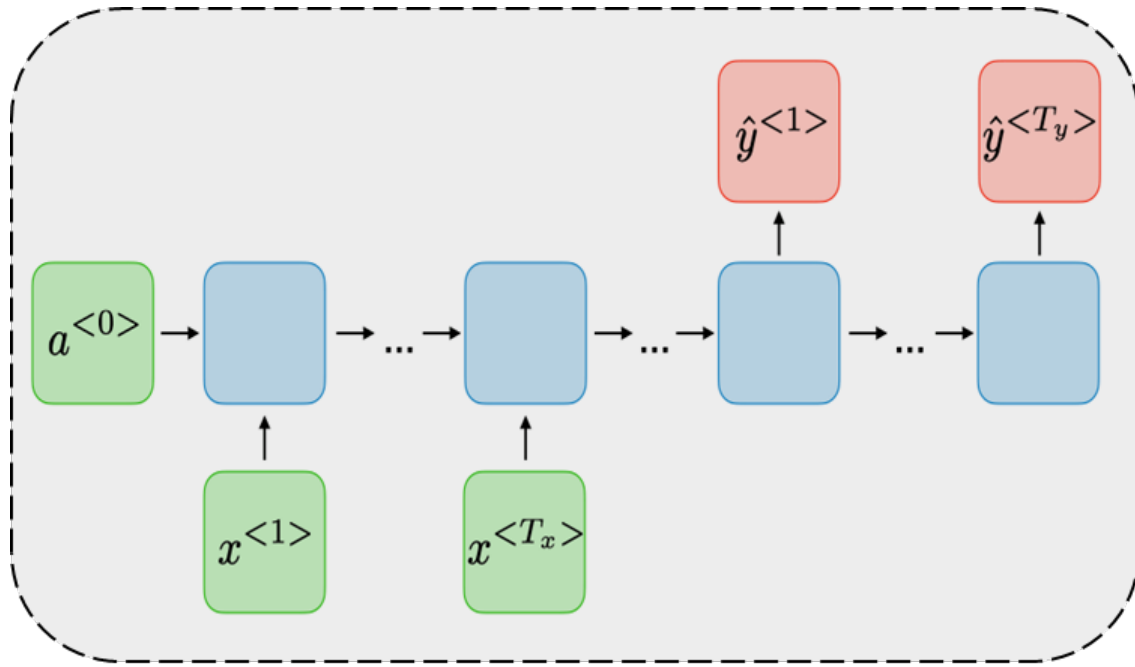


# RECURRENT NEURAL NETWORKS





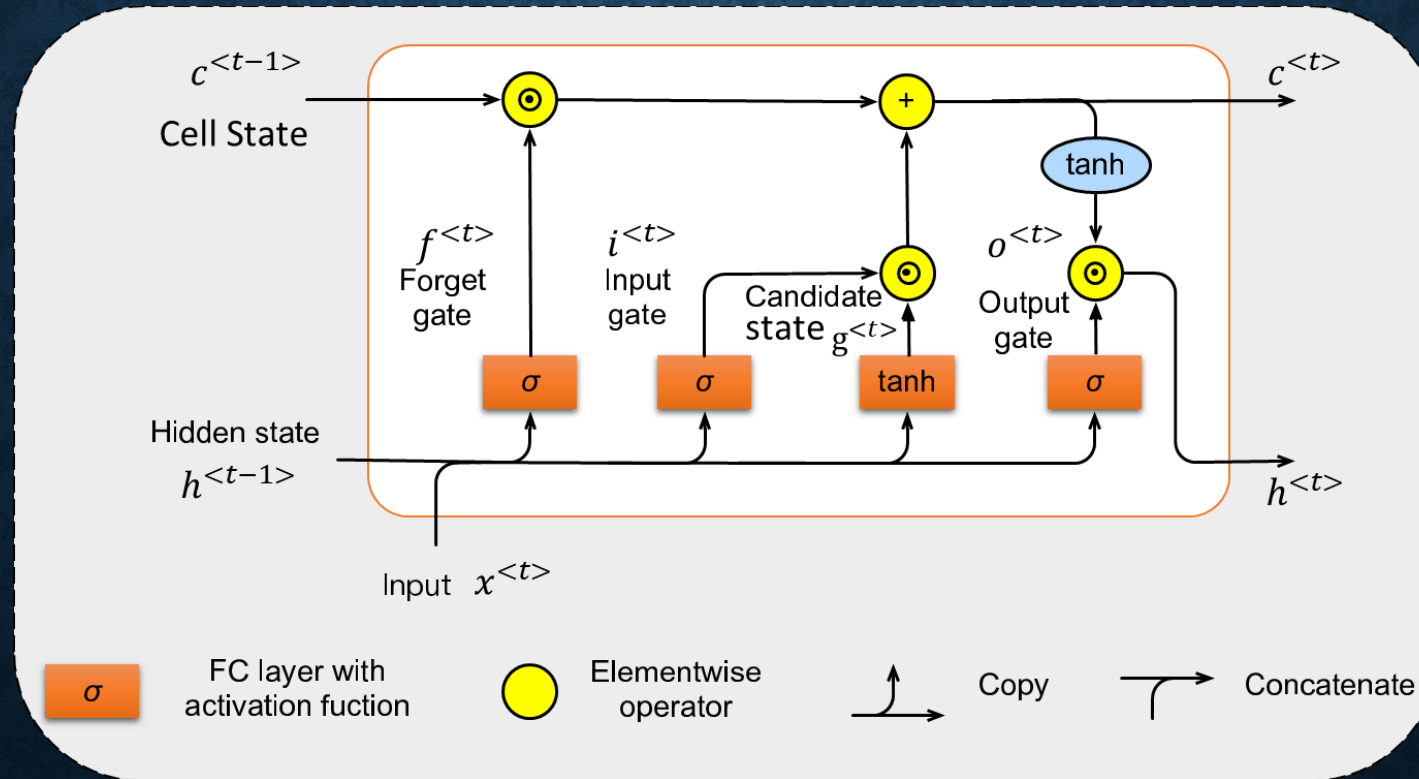
# RECURRENT NEURAL NETWORKS



# RECURRENT NEURAL NETWORKS

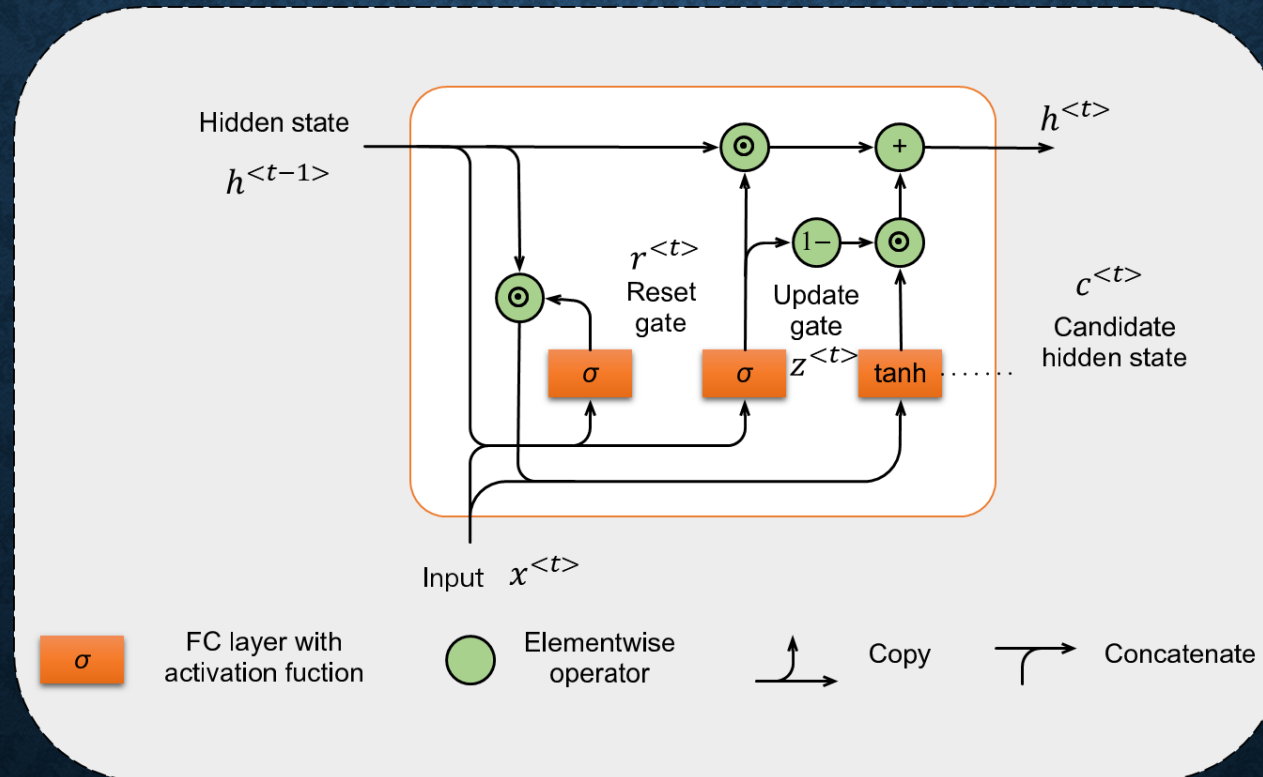


# RECURRENT NEURAL NETWORKS



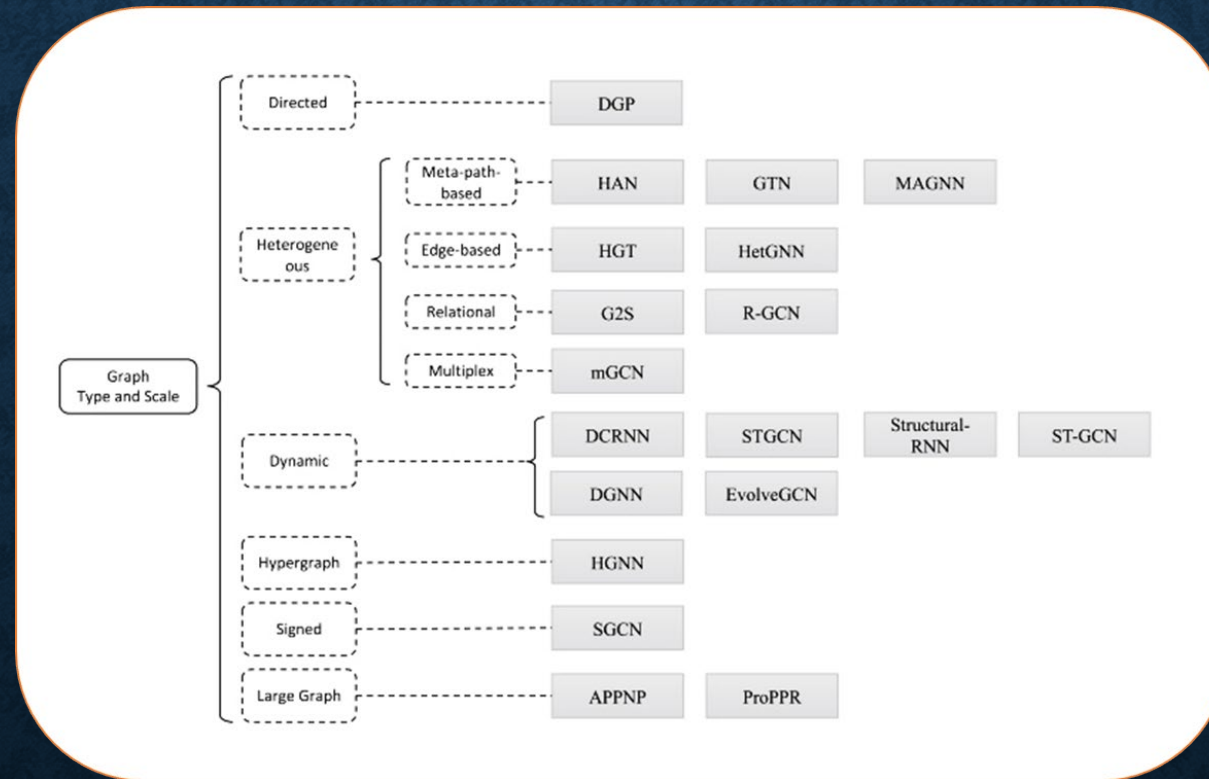


# RECURRENT NEURAL NETWORKS





# GRAPH NEURAL NETWORKS





# **SUPERVISED DATASETS AND EVALUATION MEASURES**

**KDD Cup99 Dataset**

**NSL-KDD Dataset**

**UNSW-NB15 Dataset**

**UGR'16 Dataset**

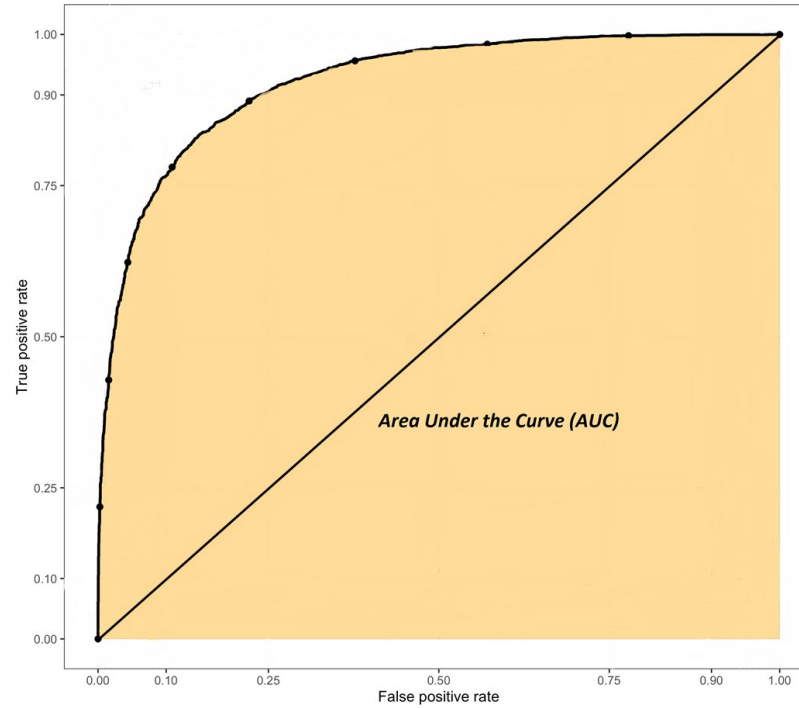
**DDoS 2016 Dataset**

**CICIDS 2017 Dataset**



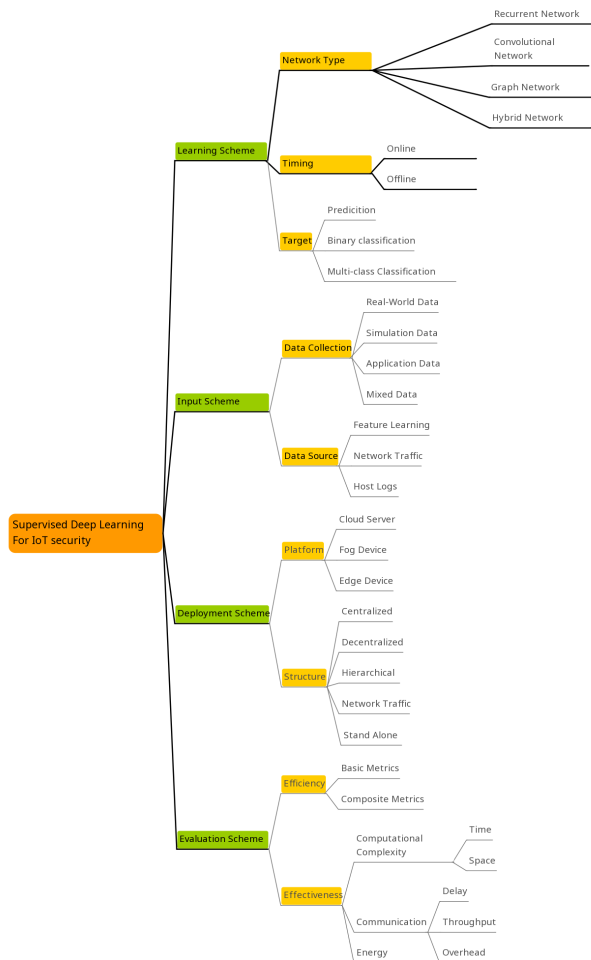
		Actual	
		Normal	Attack
Predicted	Normal	True Positive (TP)	False Negative (FN)
	Attack	False Positive (FP)	True Negative (TN)

# SUPERVISED DATASETS AND EVALUATION MEASURES



# **SUPERVISED DATASETS AND EVALUATION MEASURES**





# TAXONOMY OF DEEP LEARNING SOLUTIONS FOR IOT