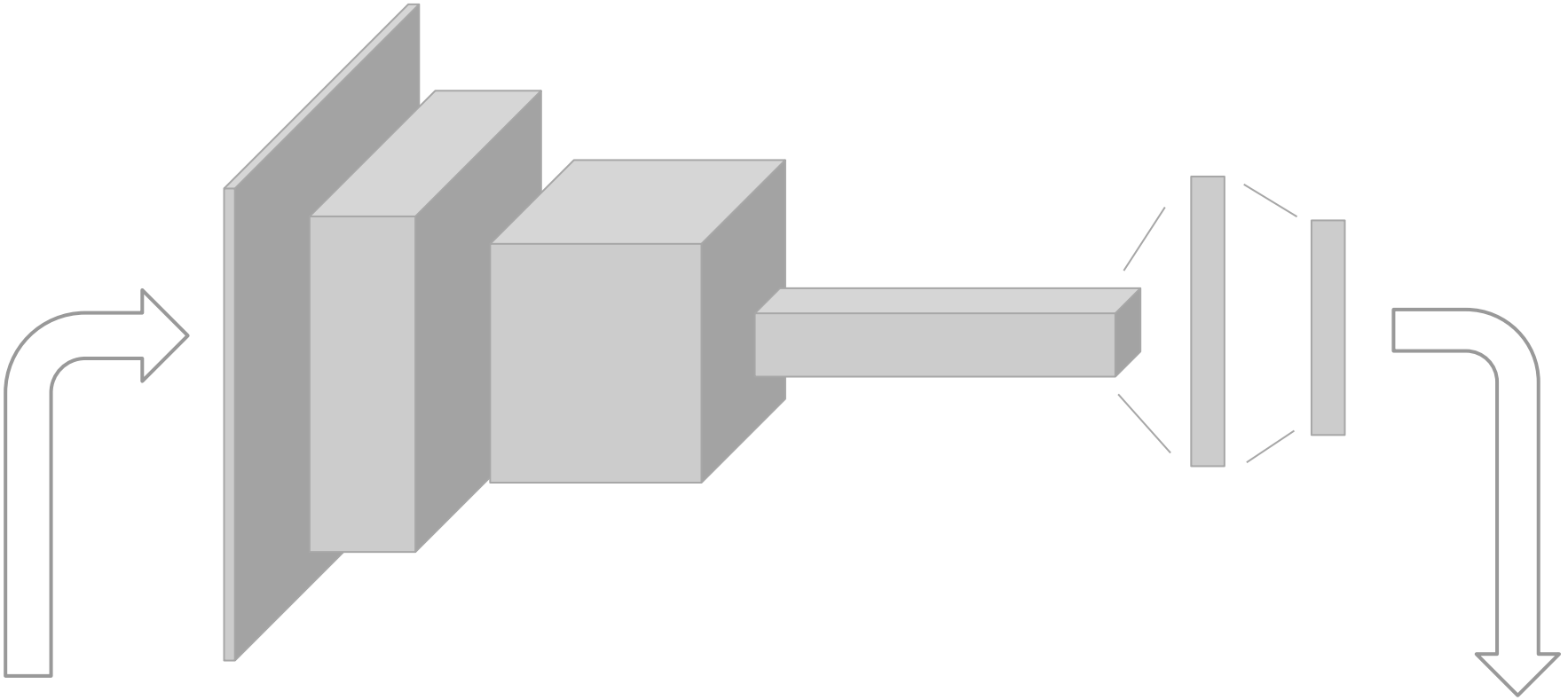
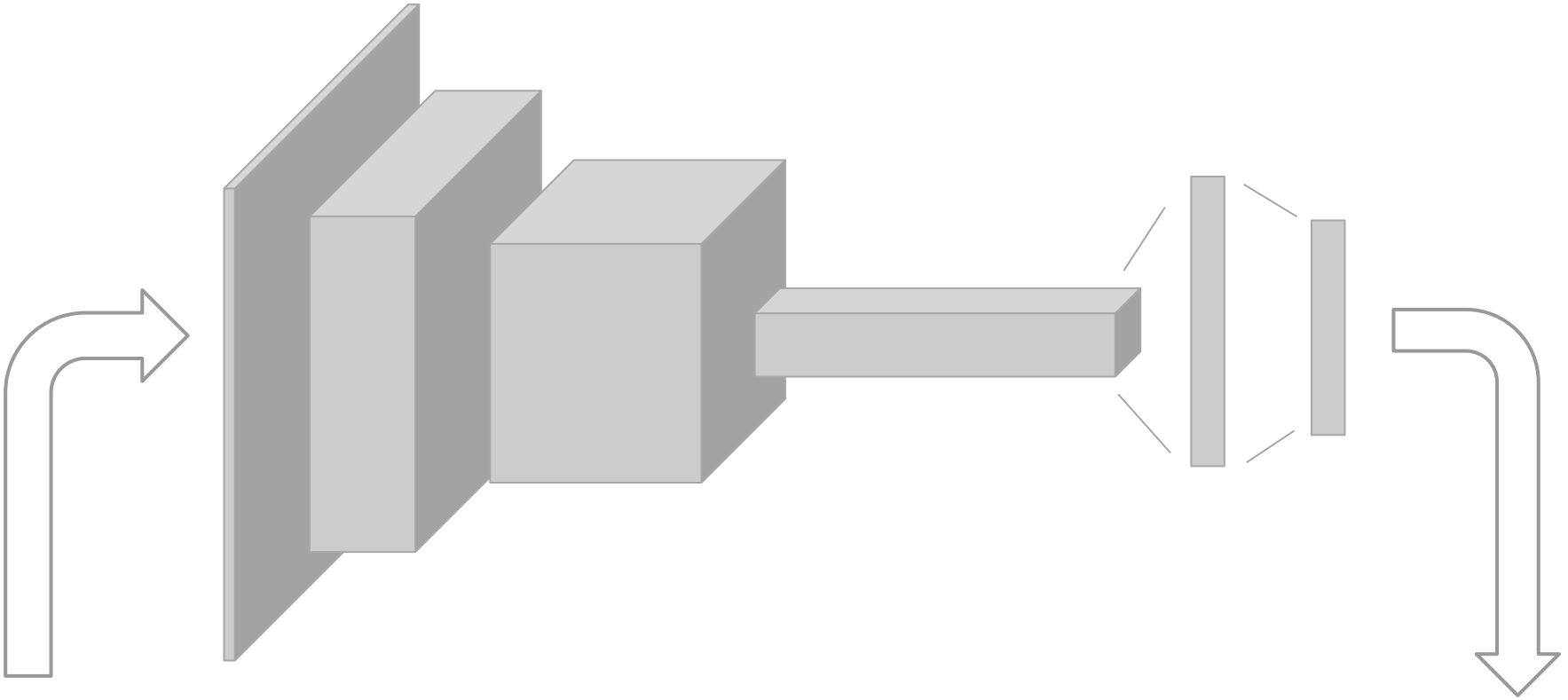
TreeConnect: A Sparse Alternative to Fully Connected Layers

Oliver Richter, Roger Wattenhofer

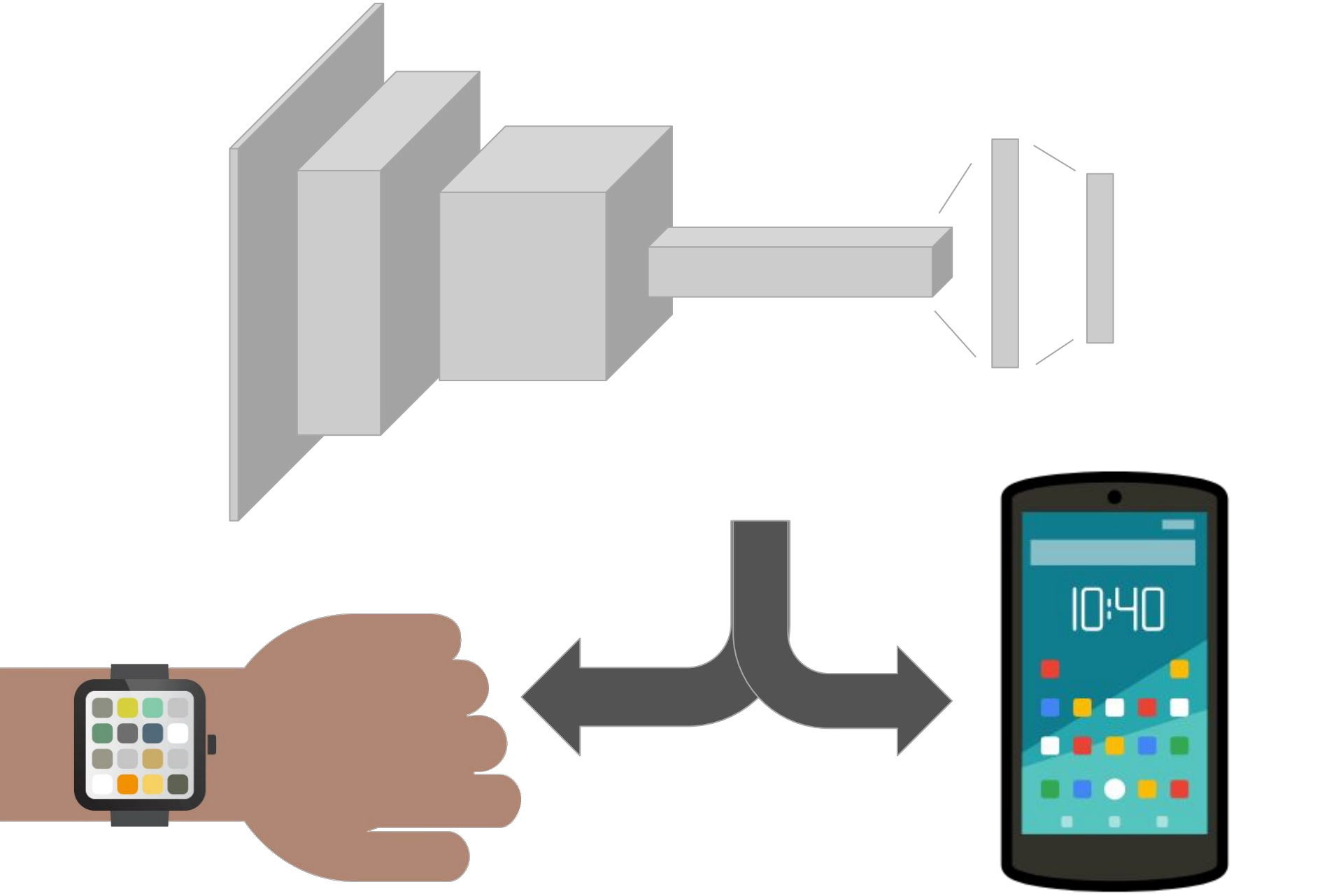
Distributed Computing Group (DisCo)
ETH Zurich
Switzerland



“cat”



“dog”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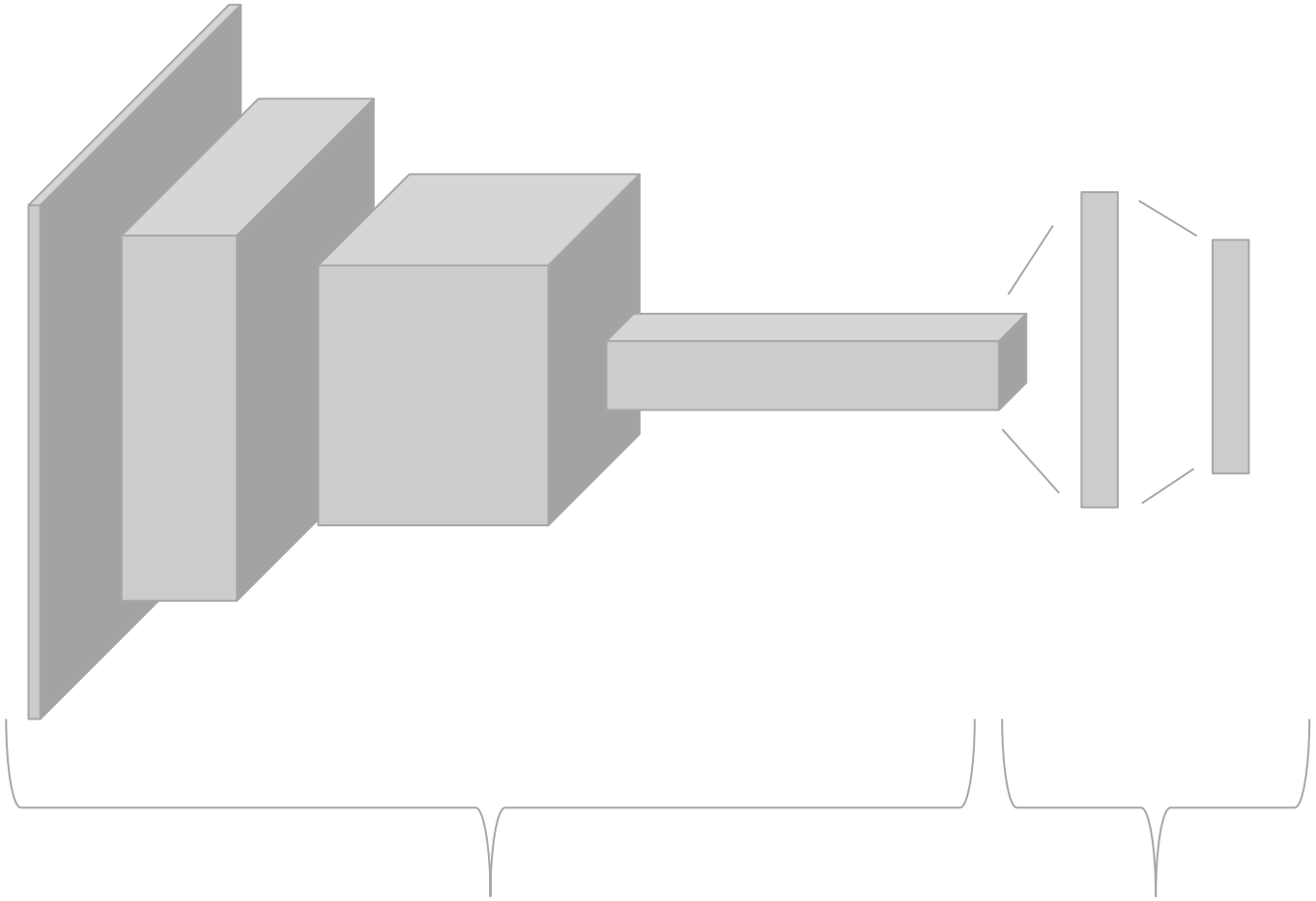
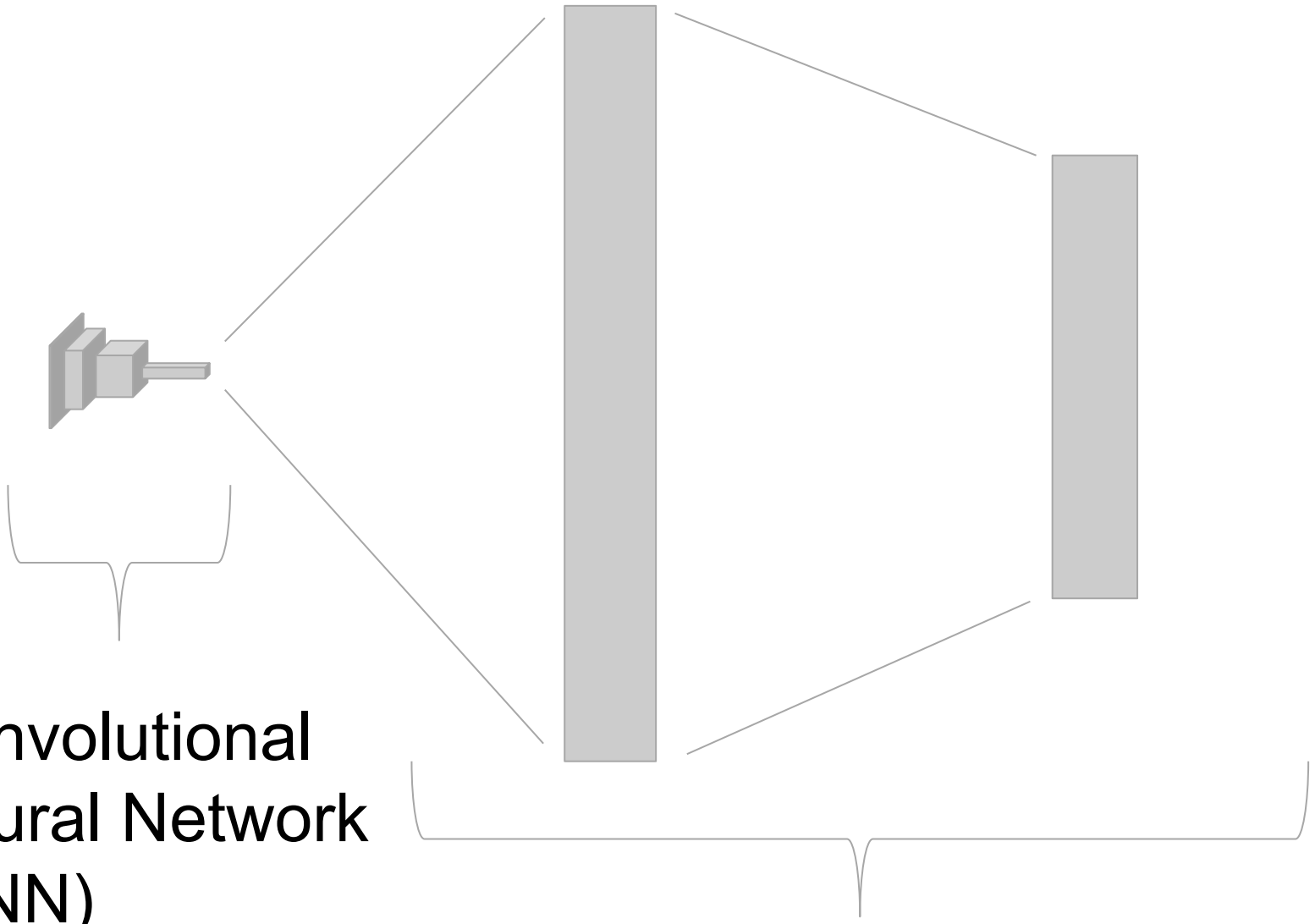
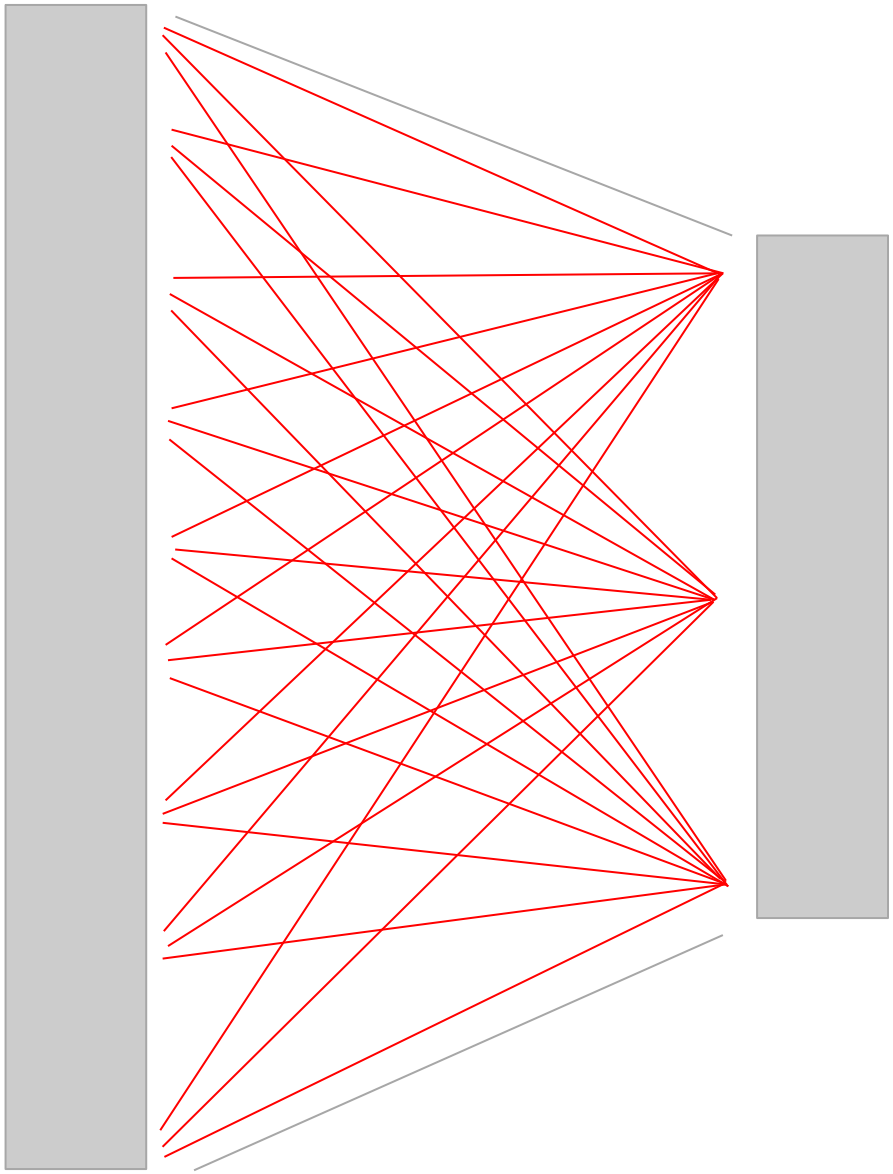
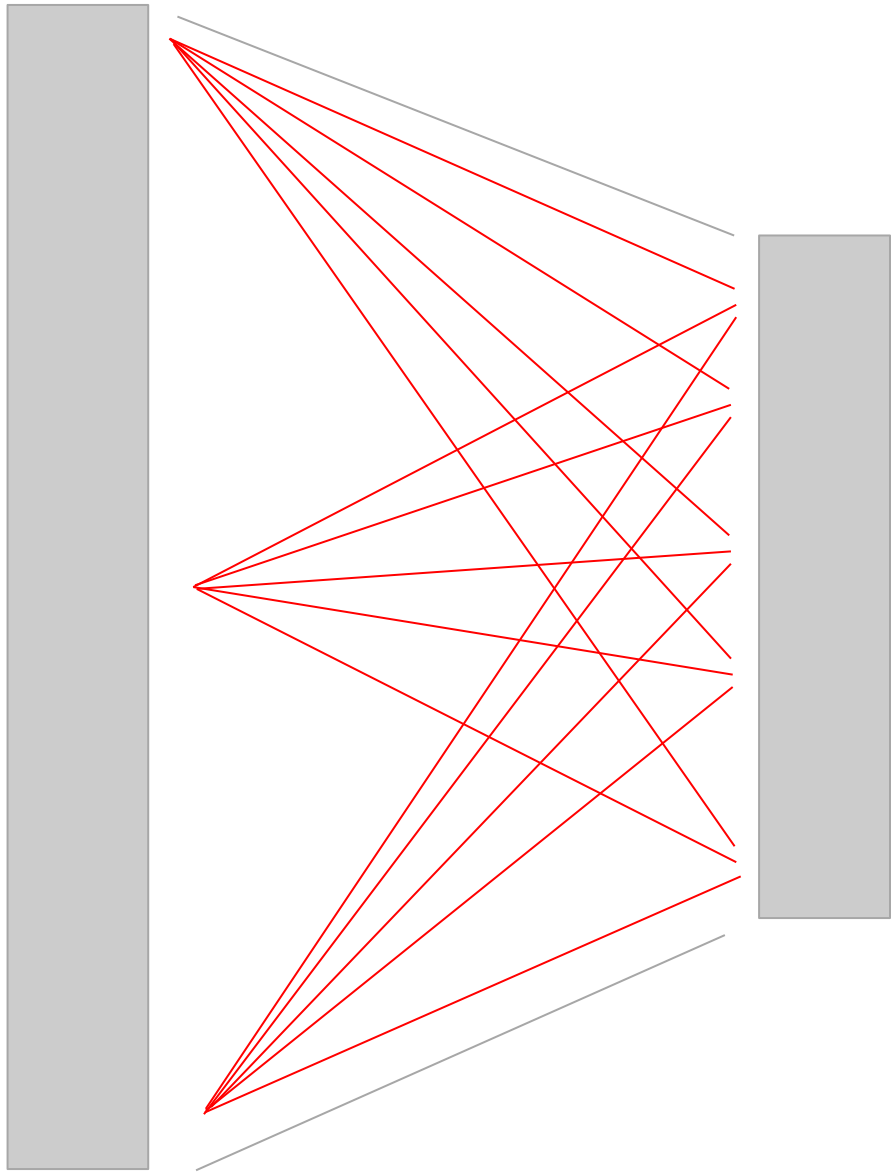


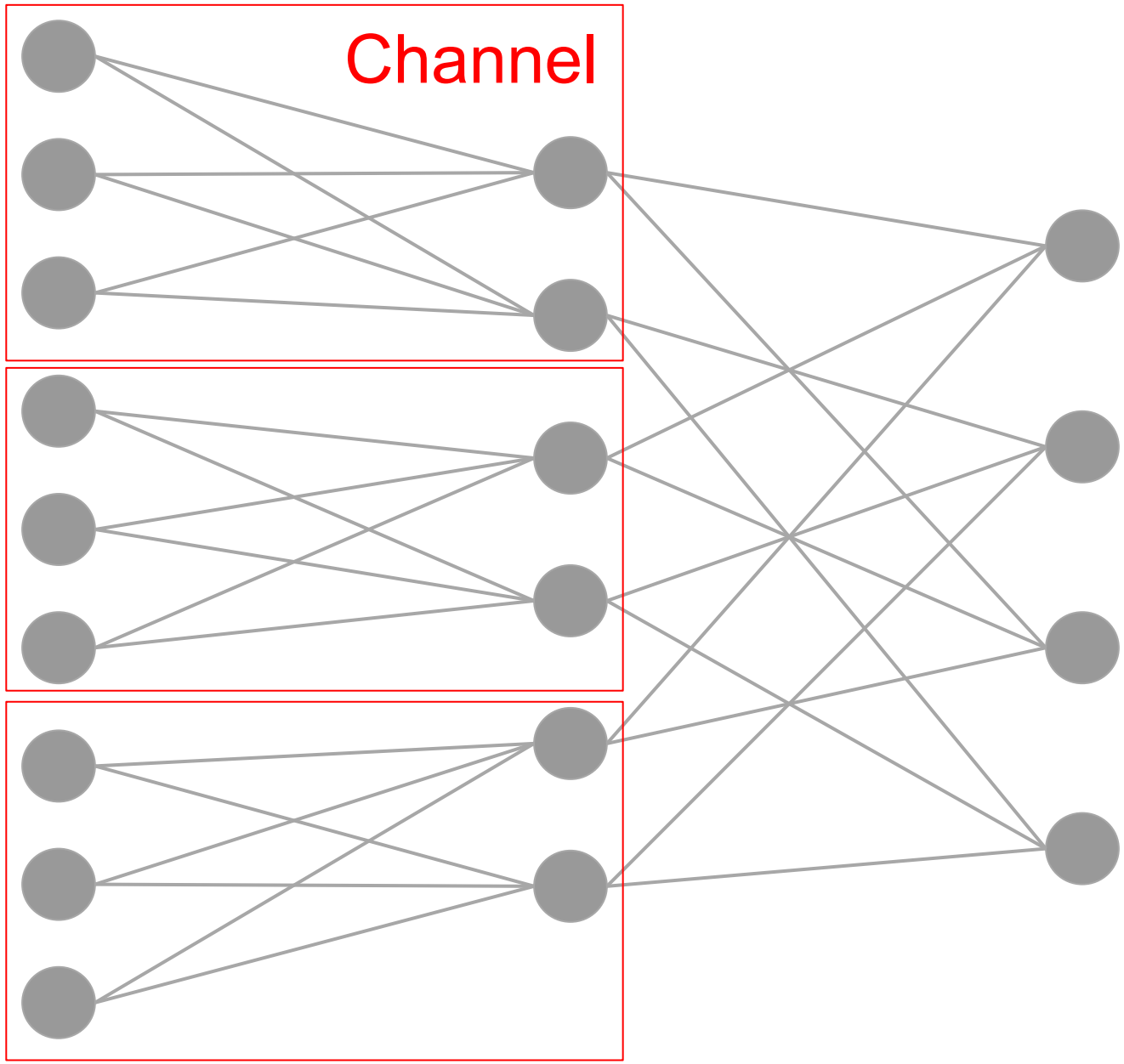
Convolutional Neural Network (CNN)

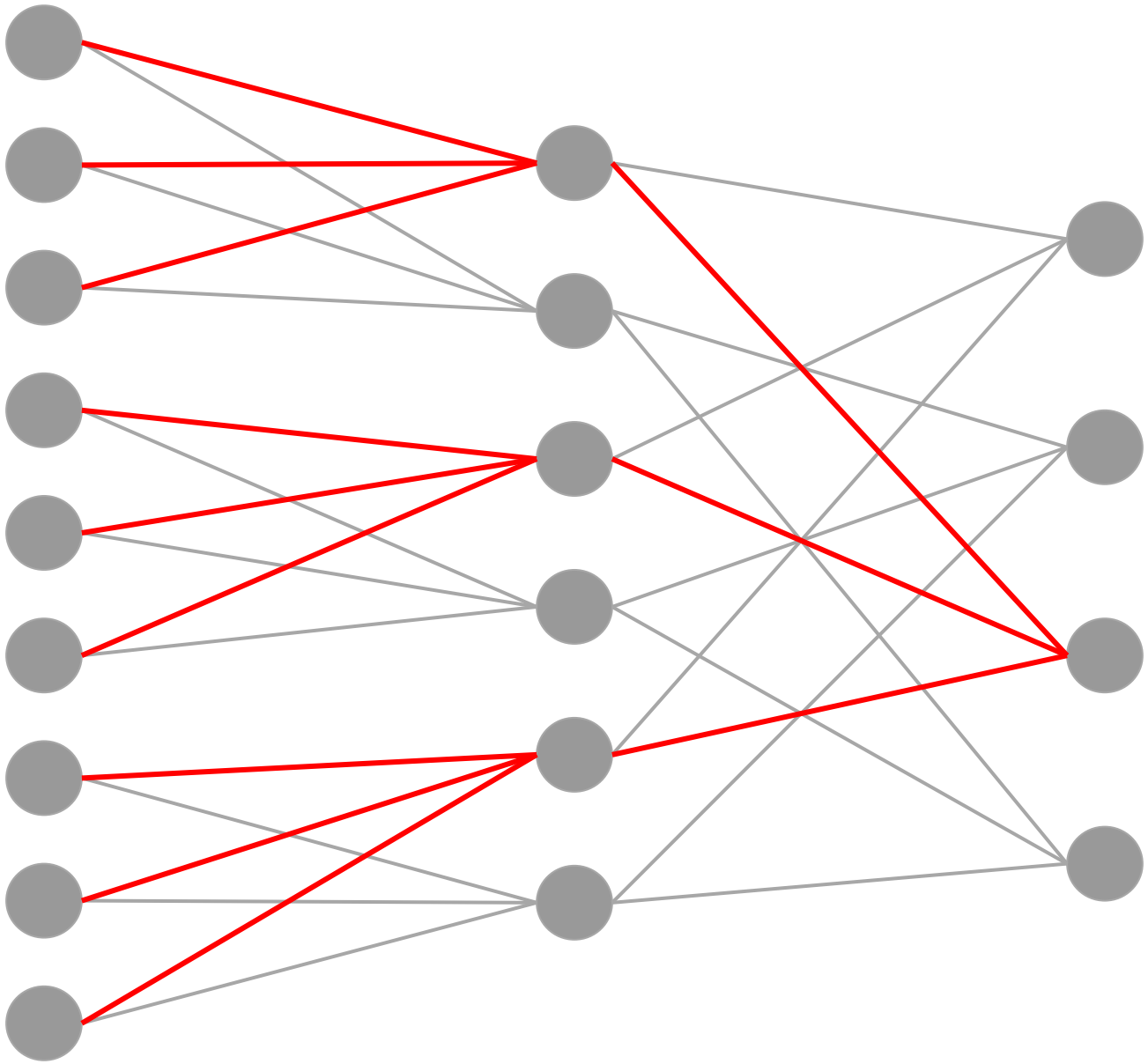
Fully Connected Layers (FC)

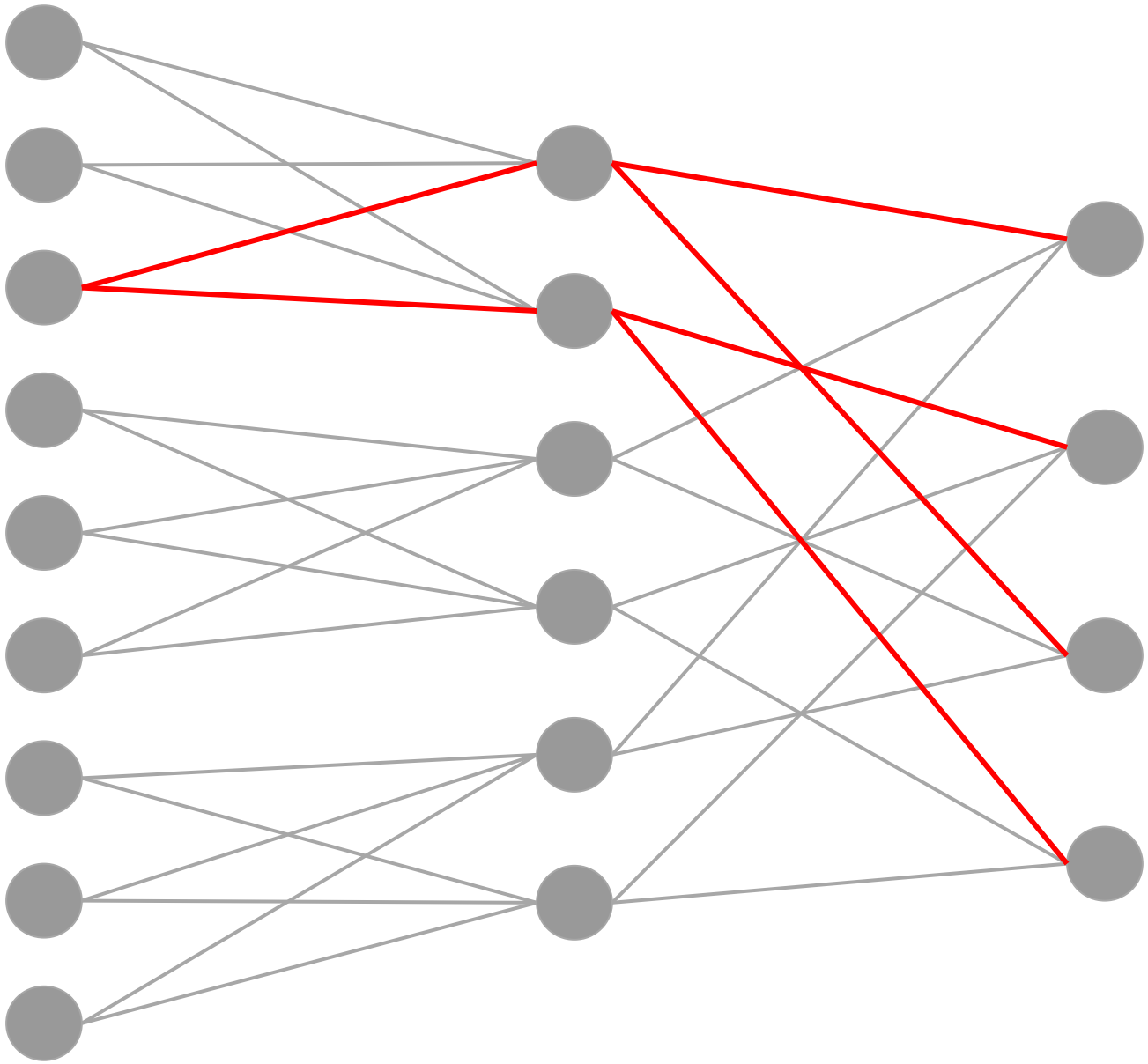

Convolutional
Neural Network
(CNN)
Fully Connected
Layers (FC)



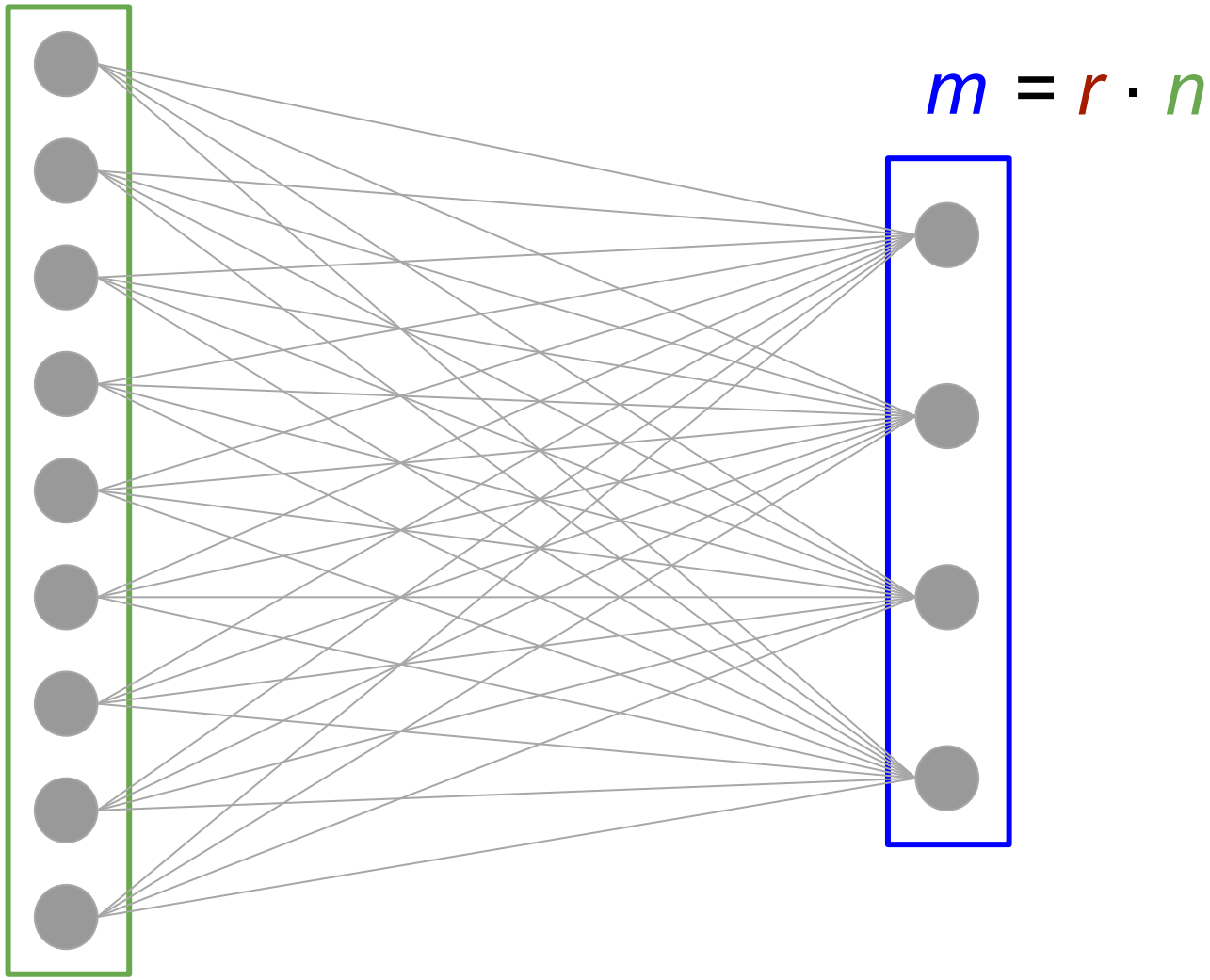



Channel





$\Theta(n^2)$

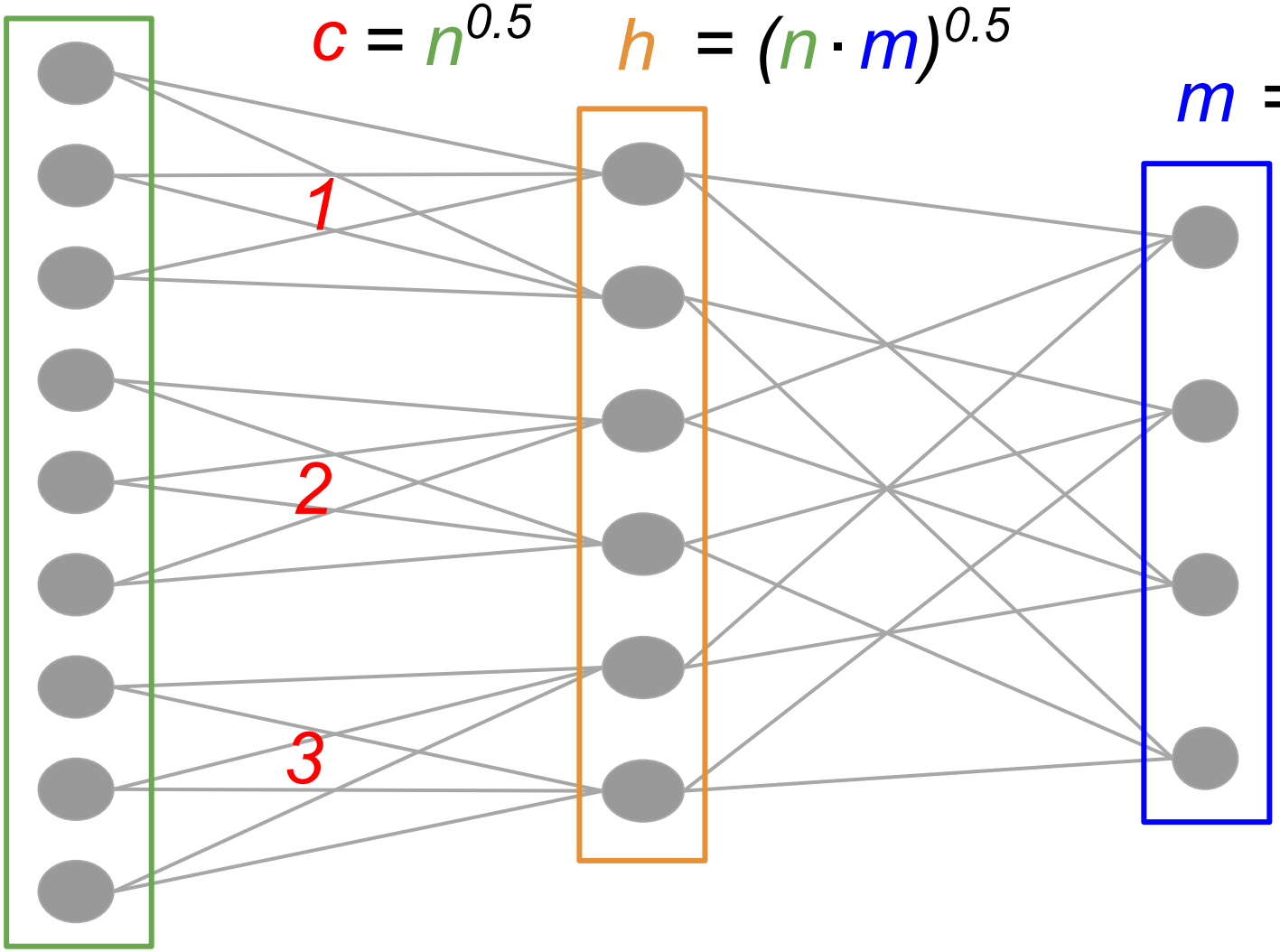


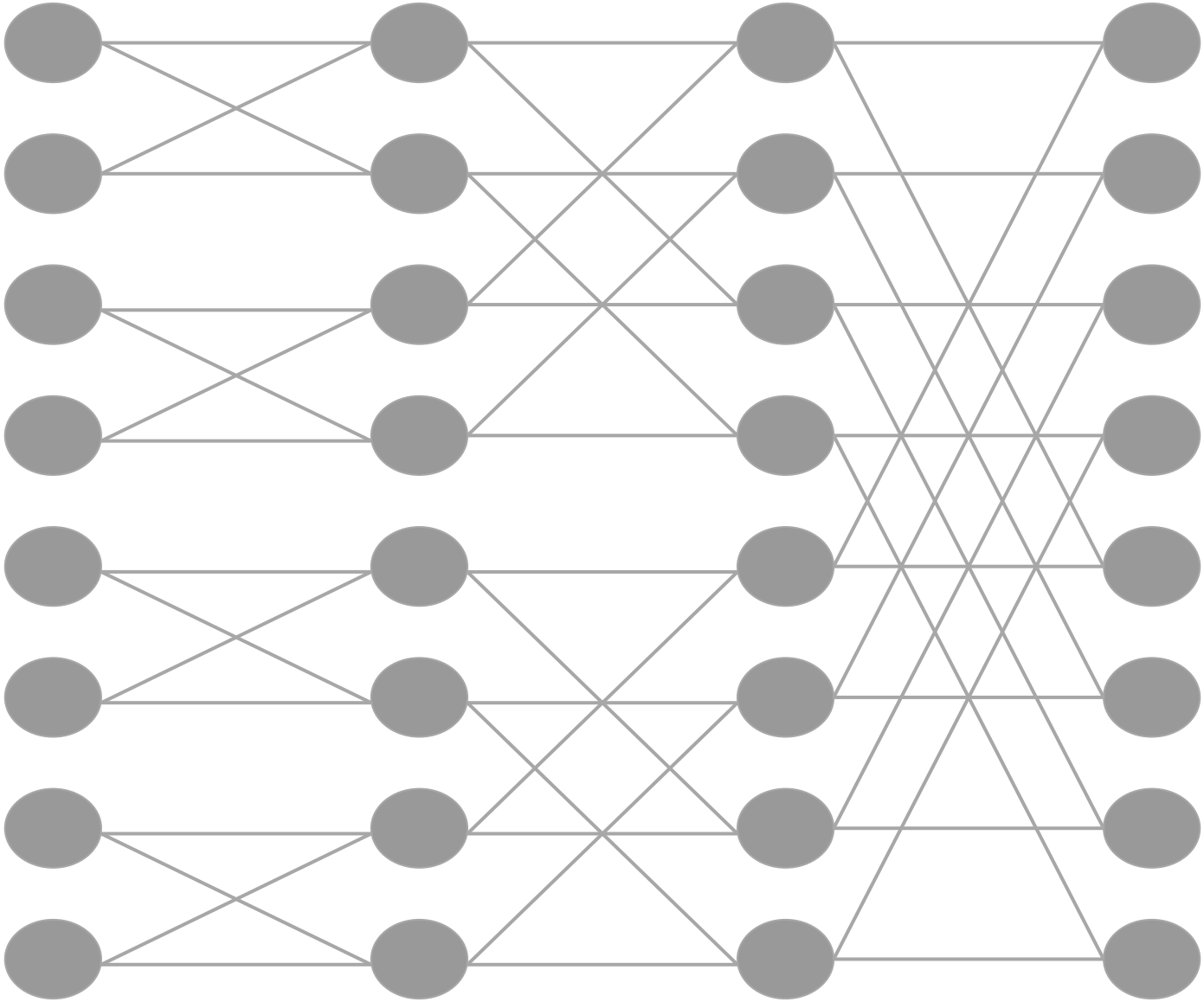
$$\Rightarrow c \cdot \frac{n}{c} \cdot \frac{h}{c} + c \cdot m = n \cdot \frac{r^{0.5} \cdot n}{n^{0.5}} + n^{0.5} \cdot r \cdot n \Rightarrow \Theta(n^{1.5})$$

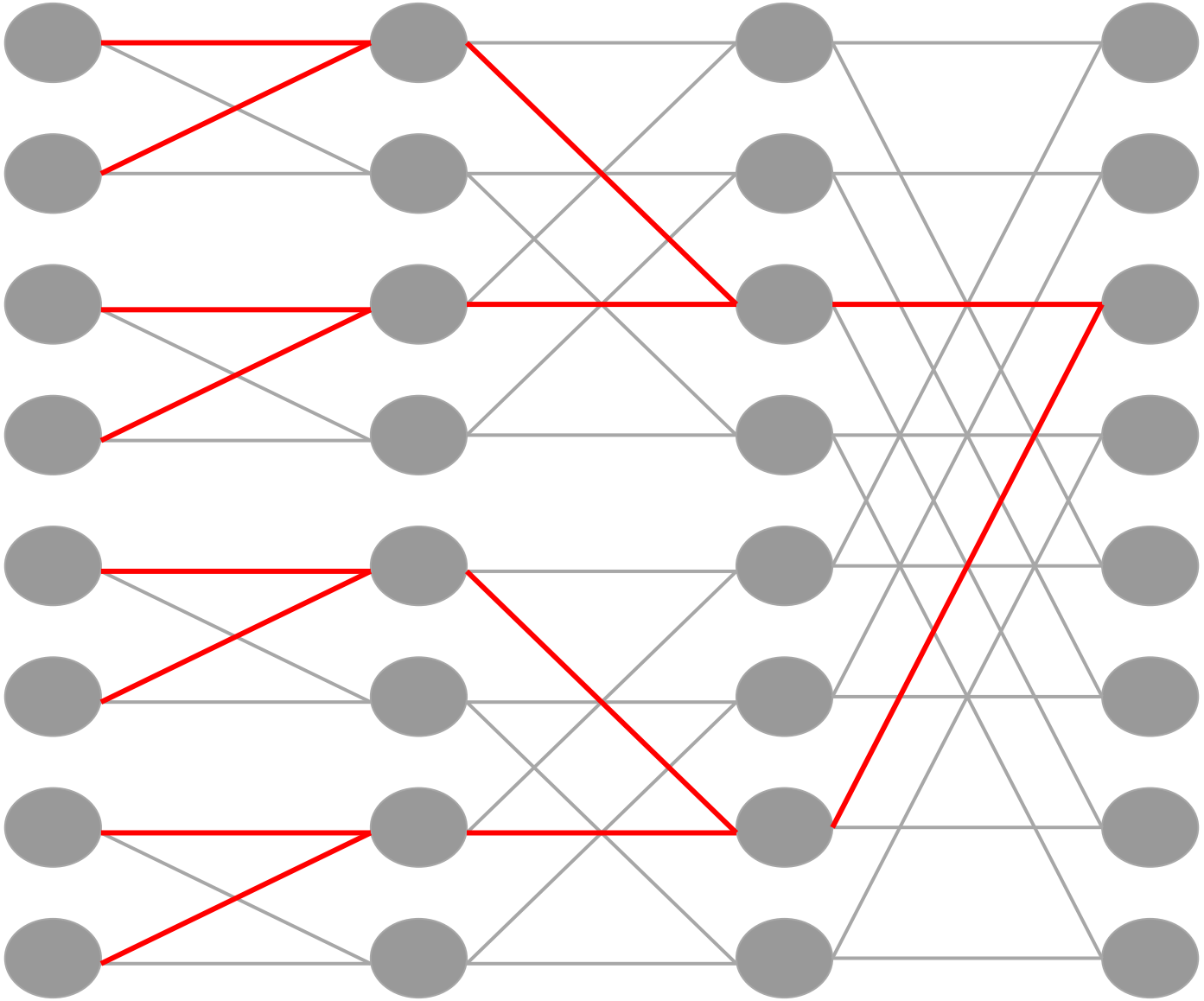
n

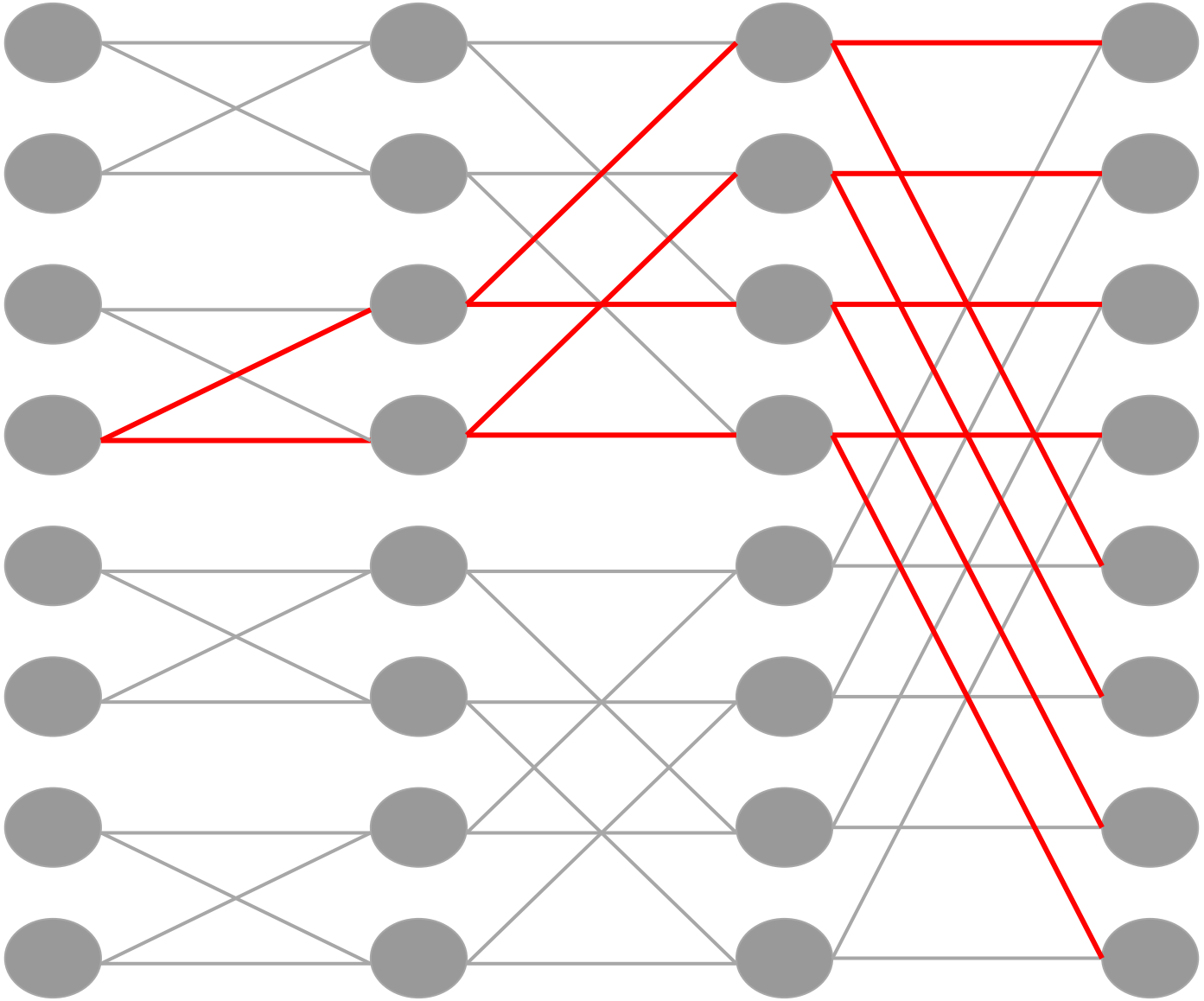
$c = n^{0.5}$ $h = (n \cdot m)^{0.5}$

$m = r \cdot n$

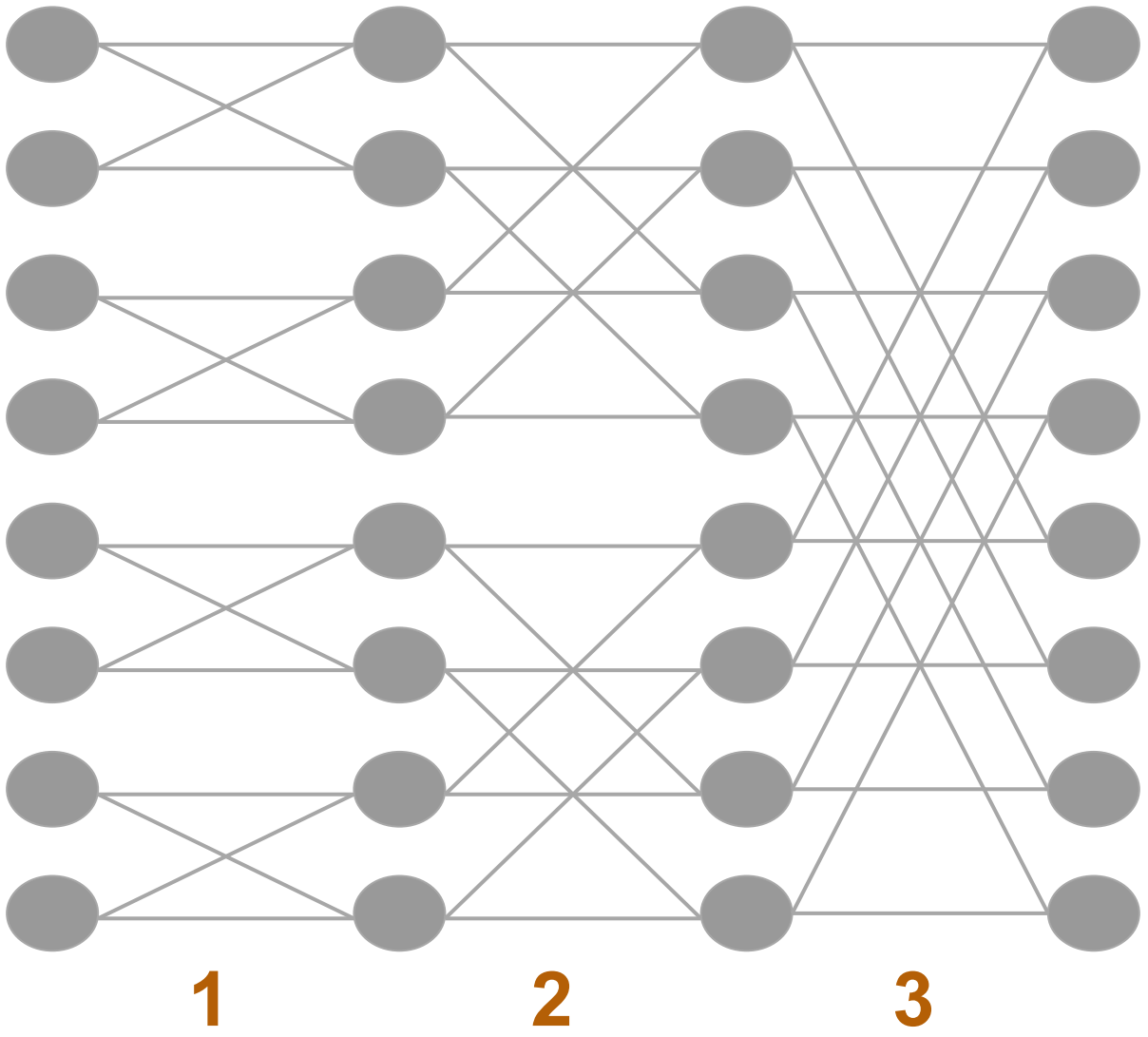








$\Rightarrow \Theta(n^{(2 \cdot L - 1) / L}) \Rightarrow \Theta(n^2)$



IMDB sentiment classification

Review (X)

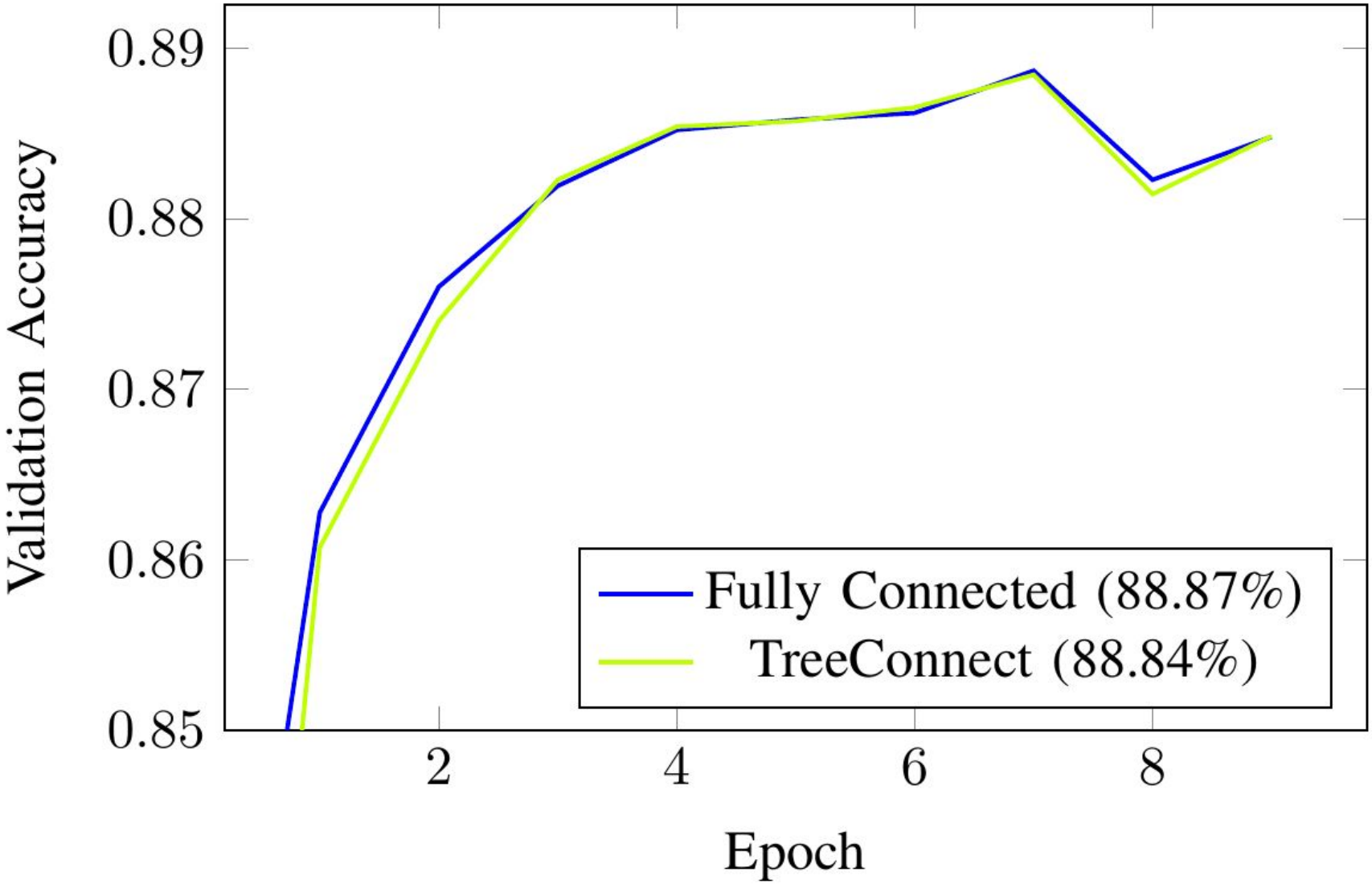
Rating (Y)

"This movie is fantastic! I really like it because it is so good!"

"Not to my taste, will skip and watch another movie"

"This movie really sucks! Can I get my money back please?"

IMDB sentiment classification



Reuters News Categorization

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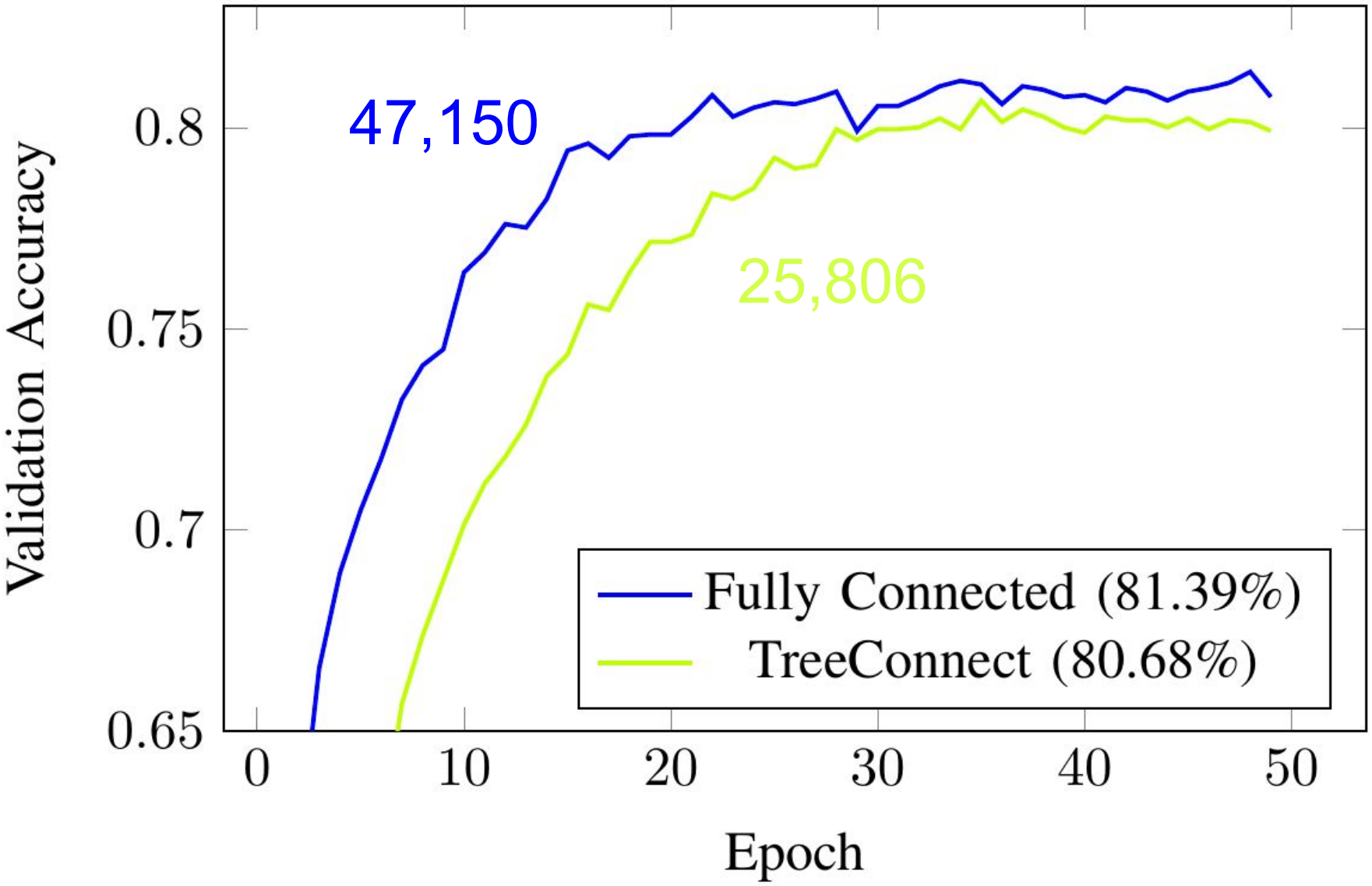
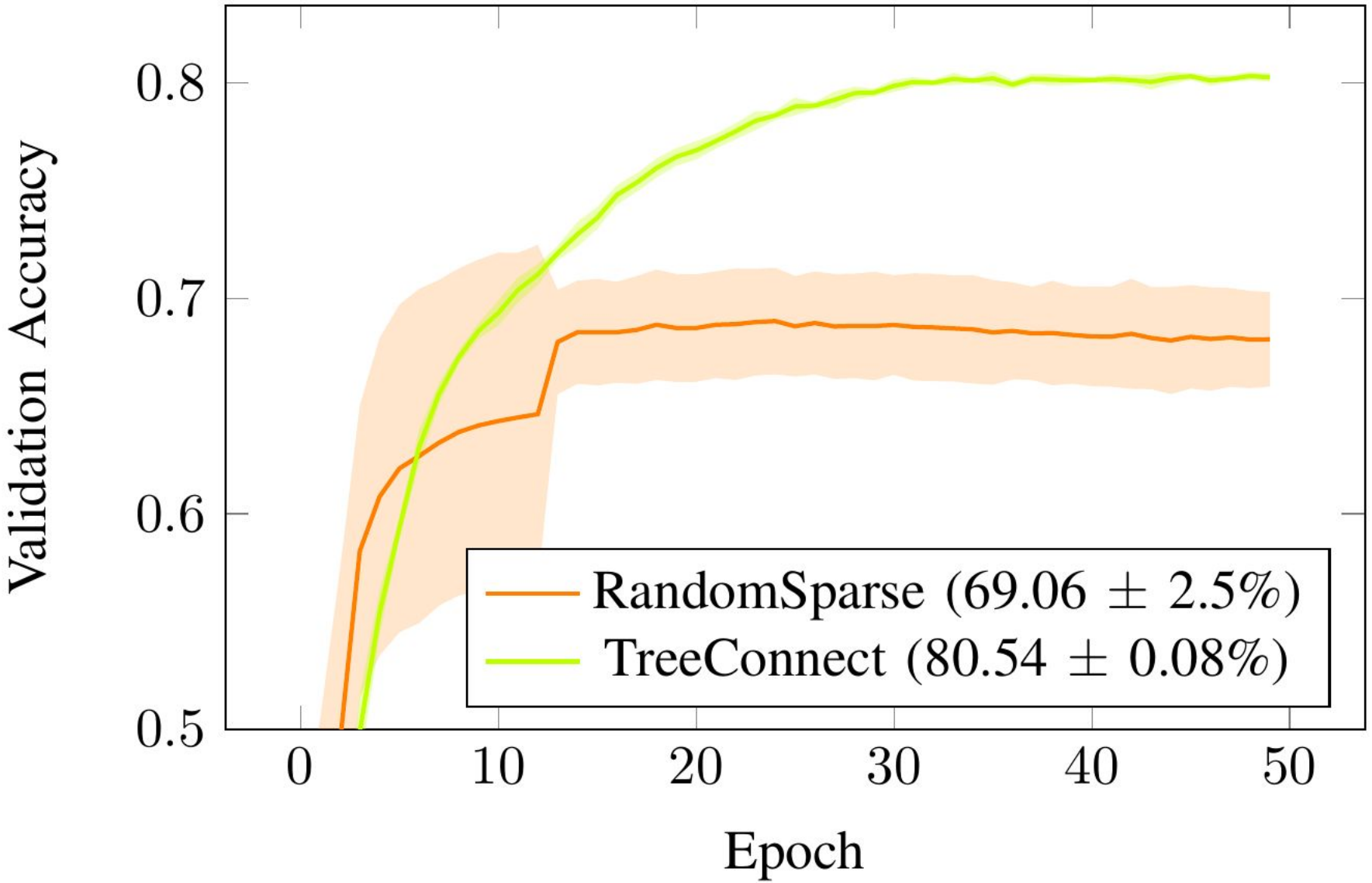
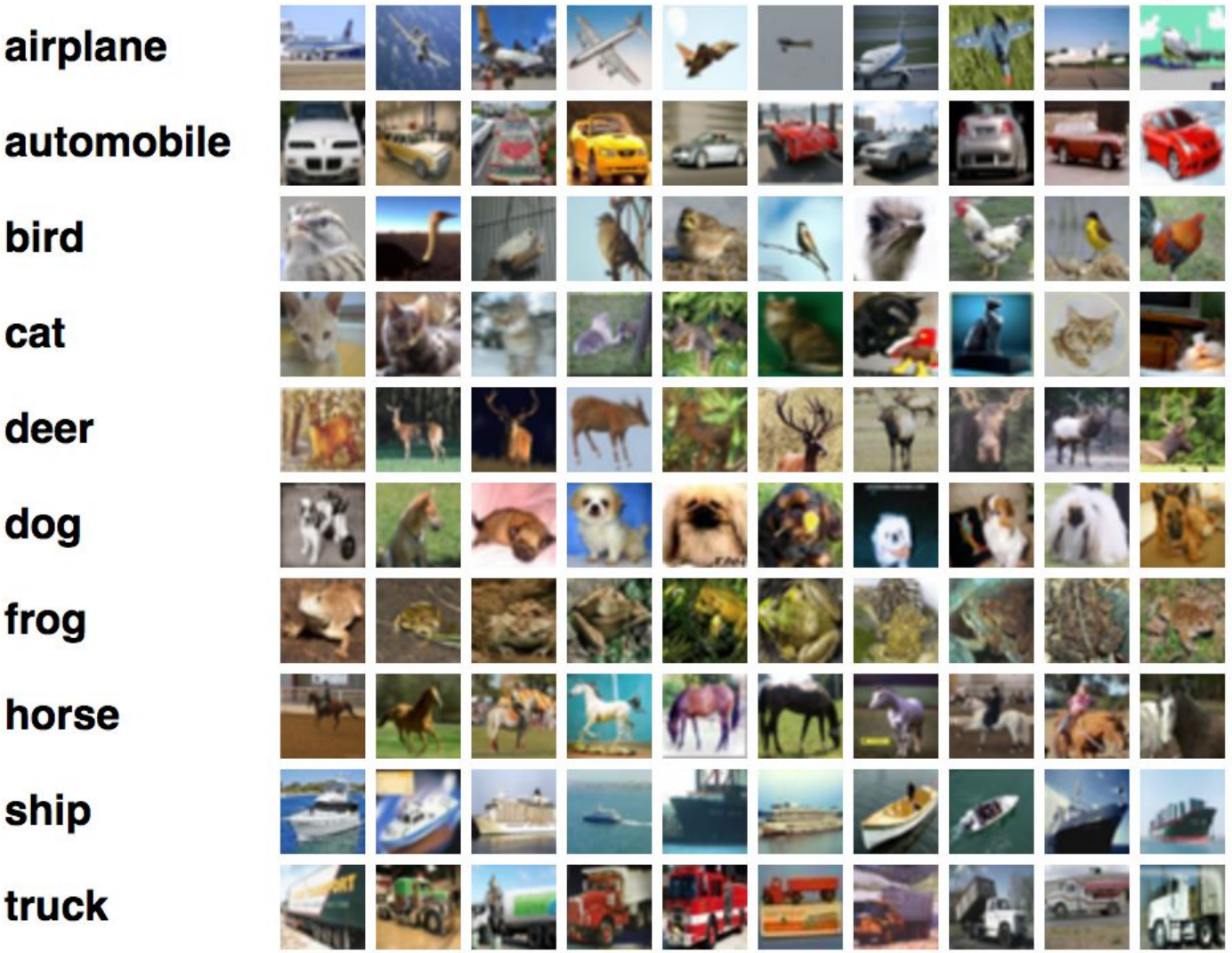


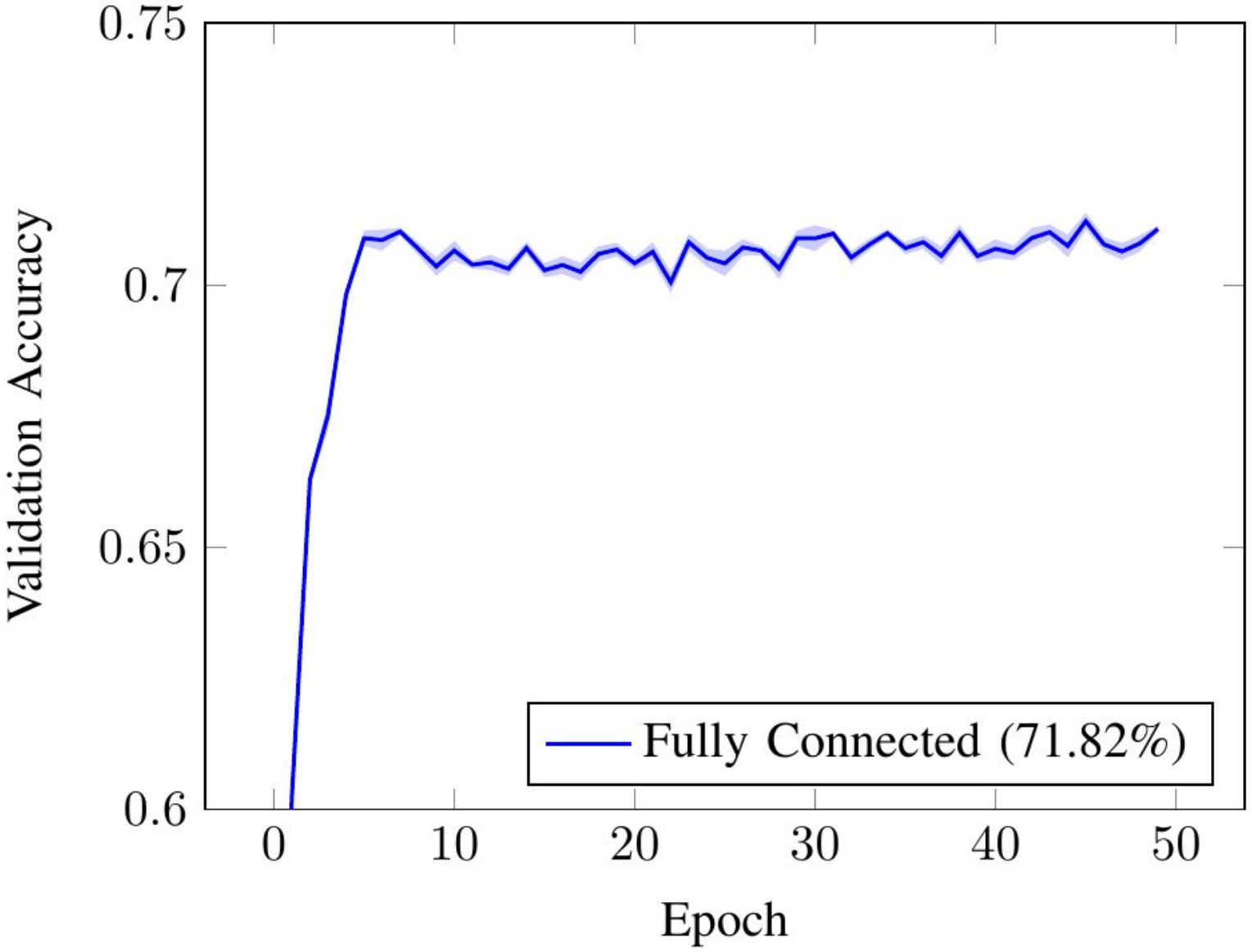
Reuters News Categorization



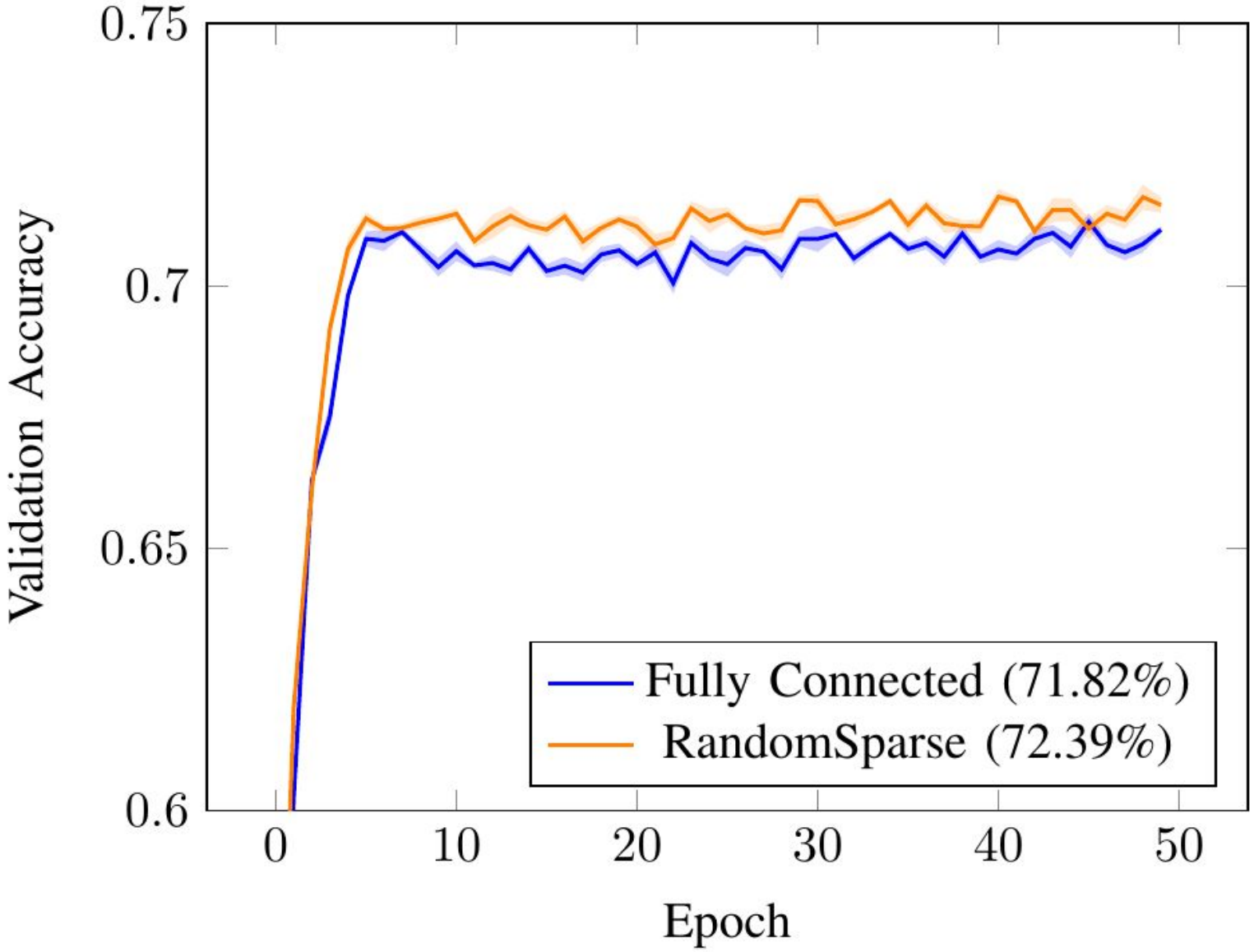
CIFAR-10 Image Classification



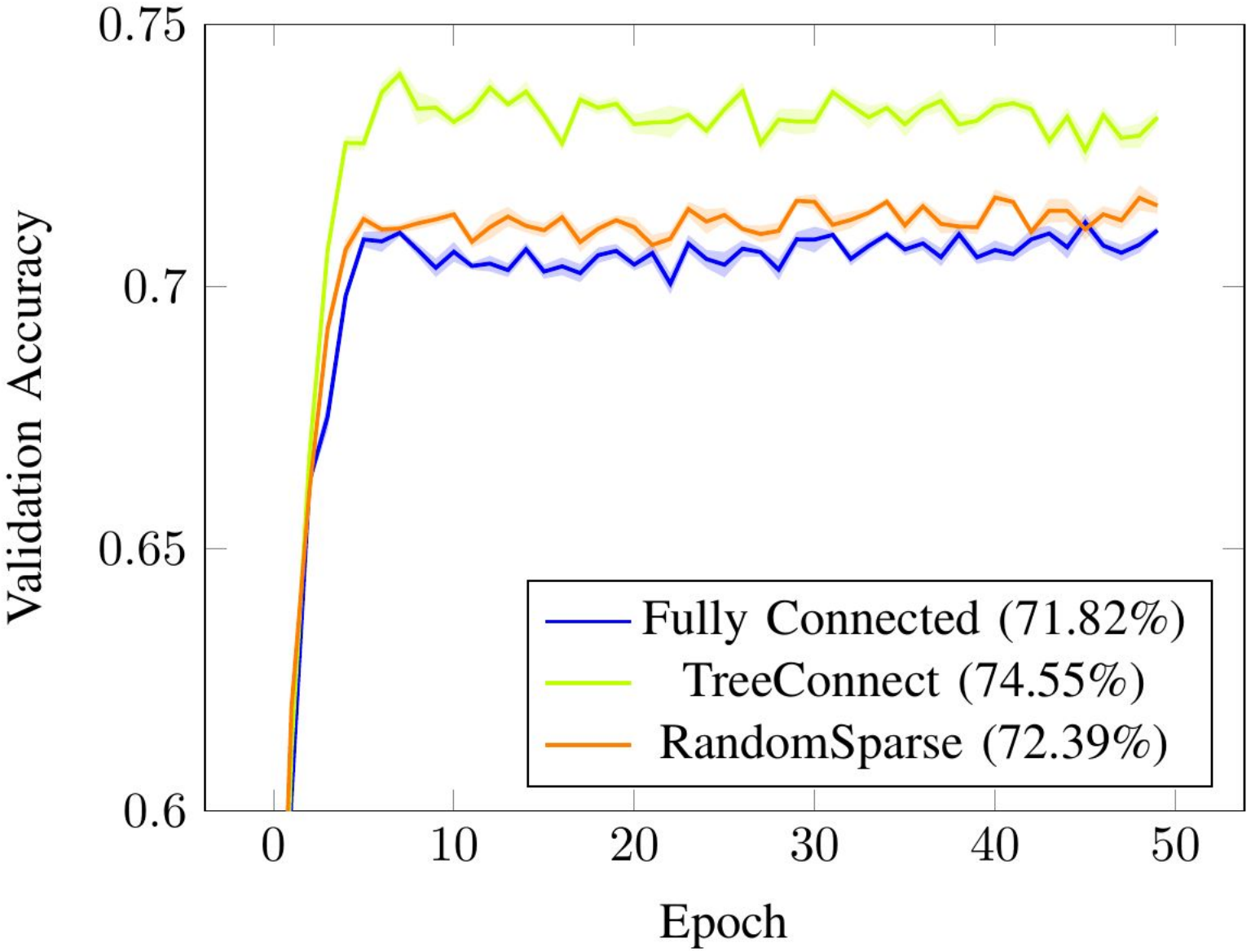
CIFAR-10 Image Classification



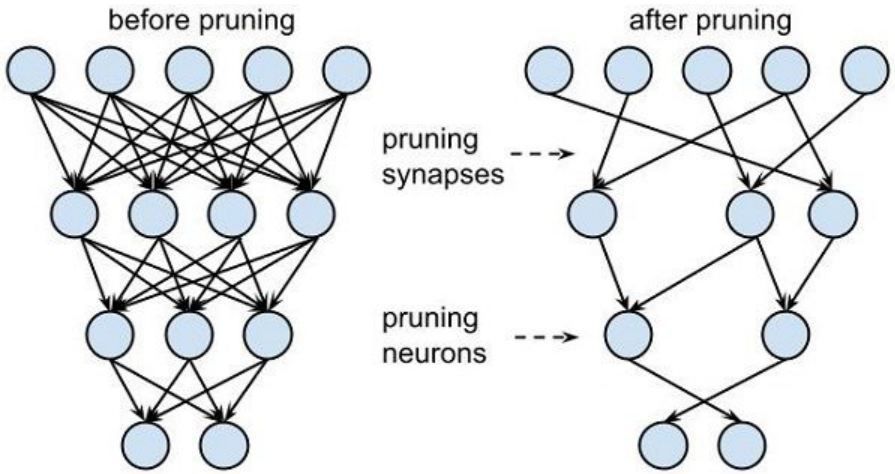
CIFAR-10 Image Classification

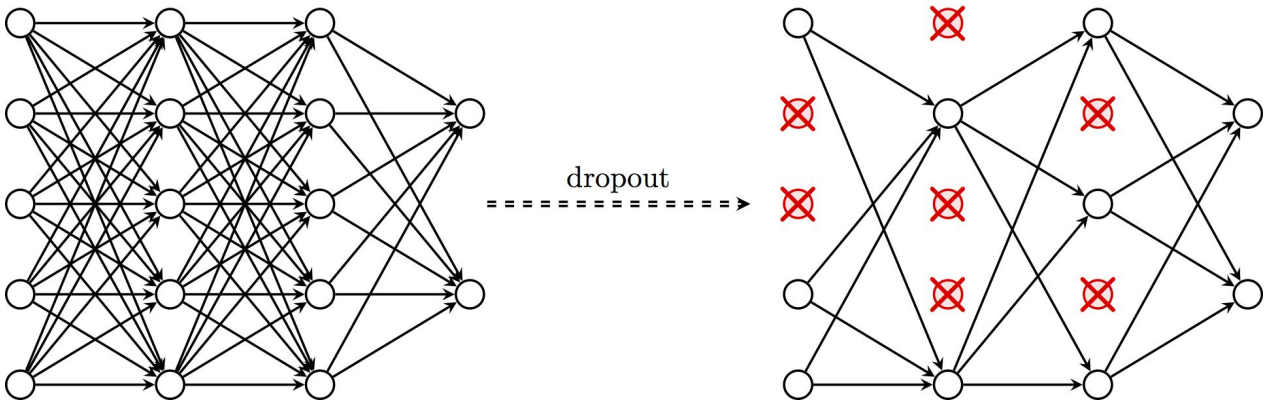


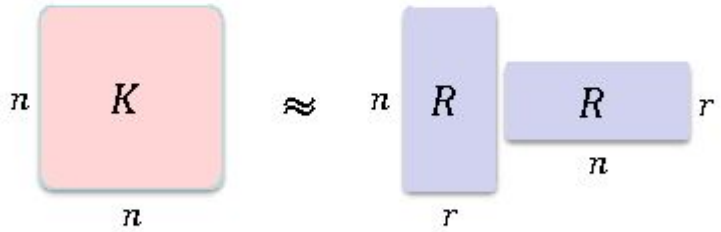
CIFAR-10 Image Classification



Related Work





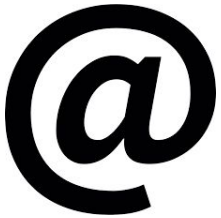


Questions & Answers

Code?

https://github.com/OliverRichter/TreeConnect

Further
Questions?



richtero@ethz.ch