

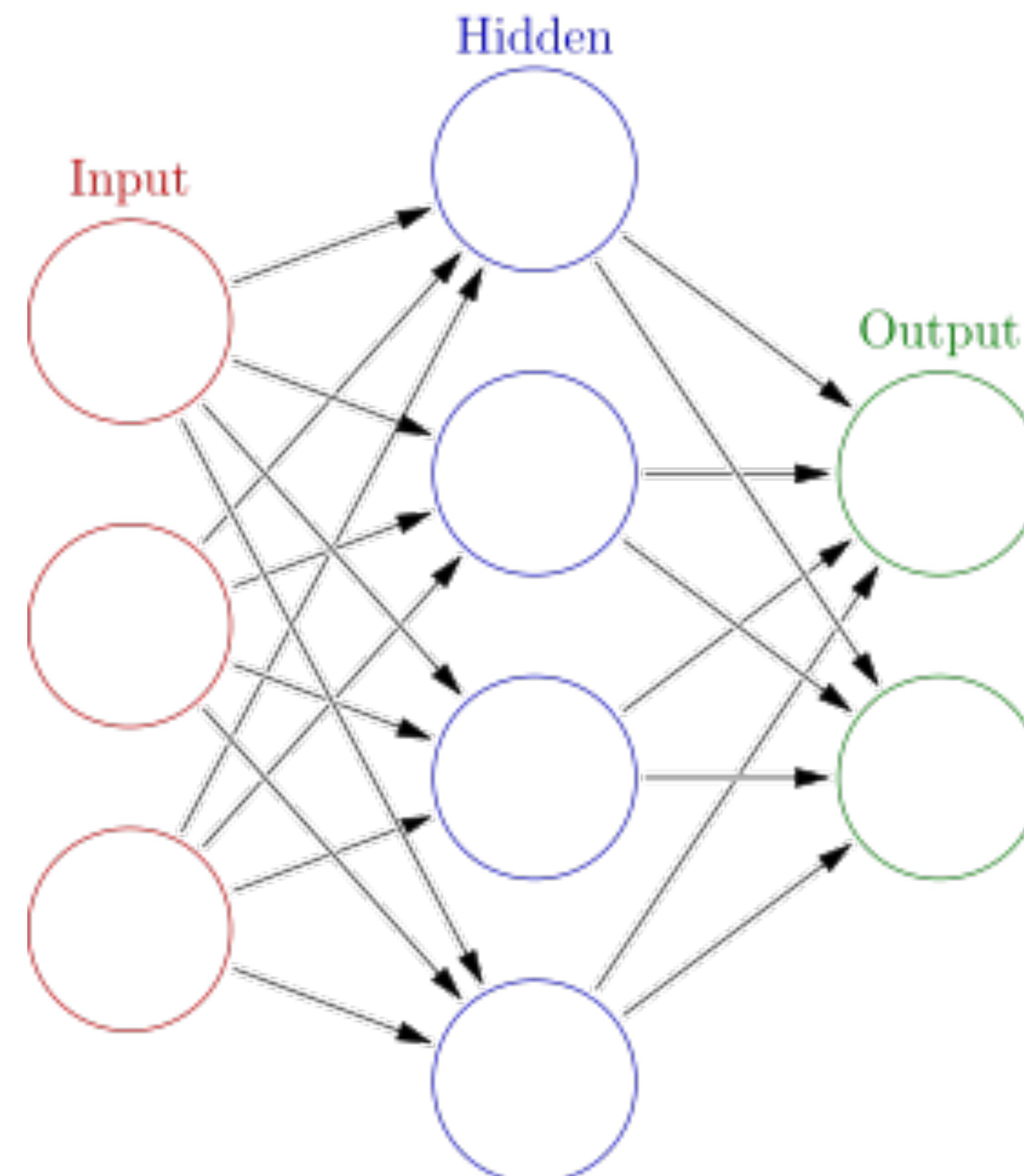
MLP Parameters



@hiddenlayers (list)

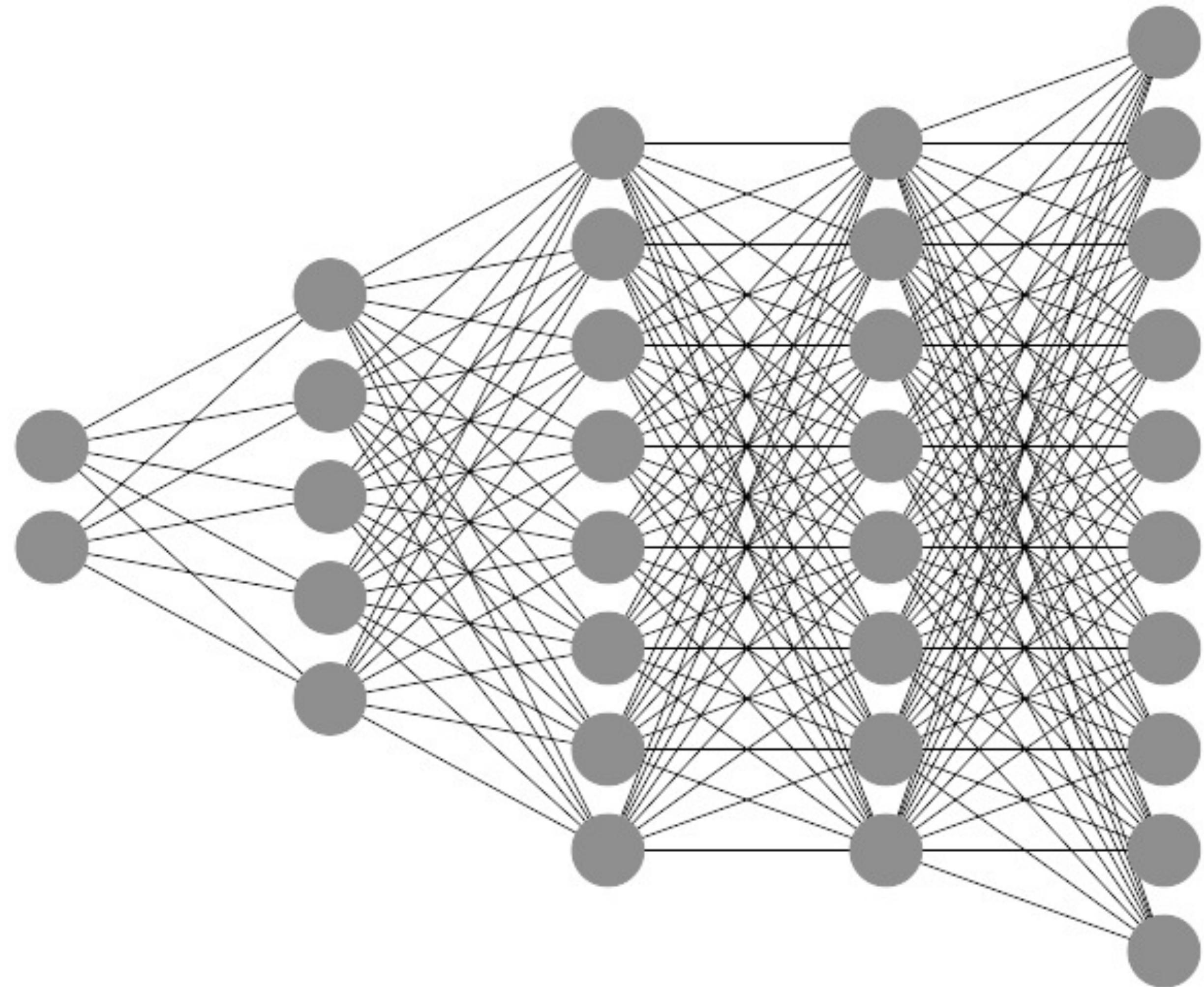
n elements = n layers

integers = n neurons

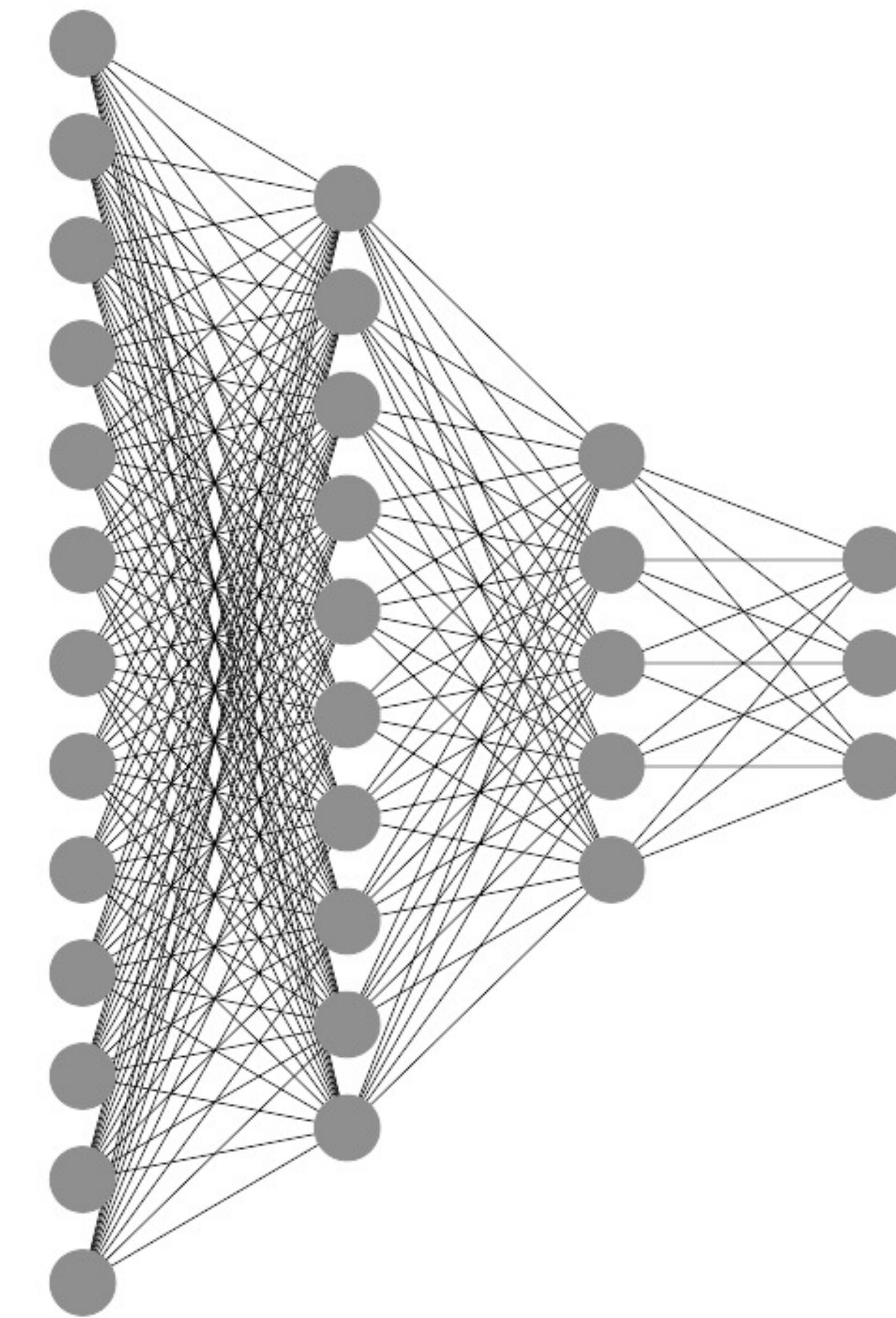


(@hiddenlayers 4)

will reset network



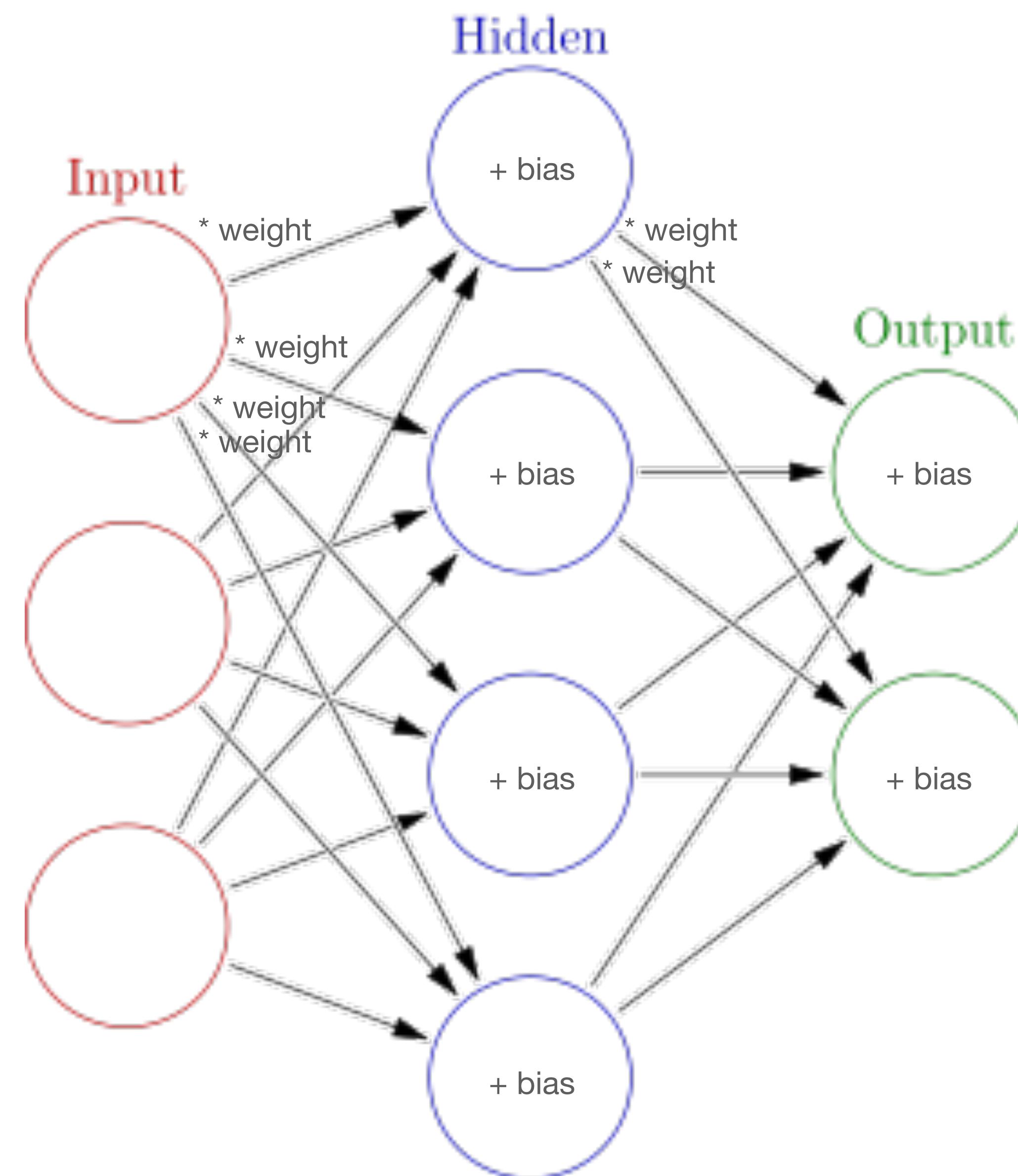
(@hiddenlayers 5 8 8)



(@hiddenlayers 10 5)

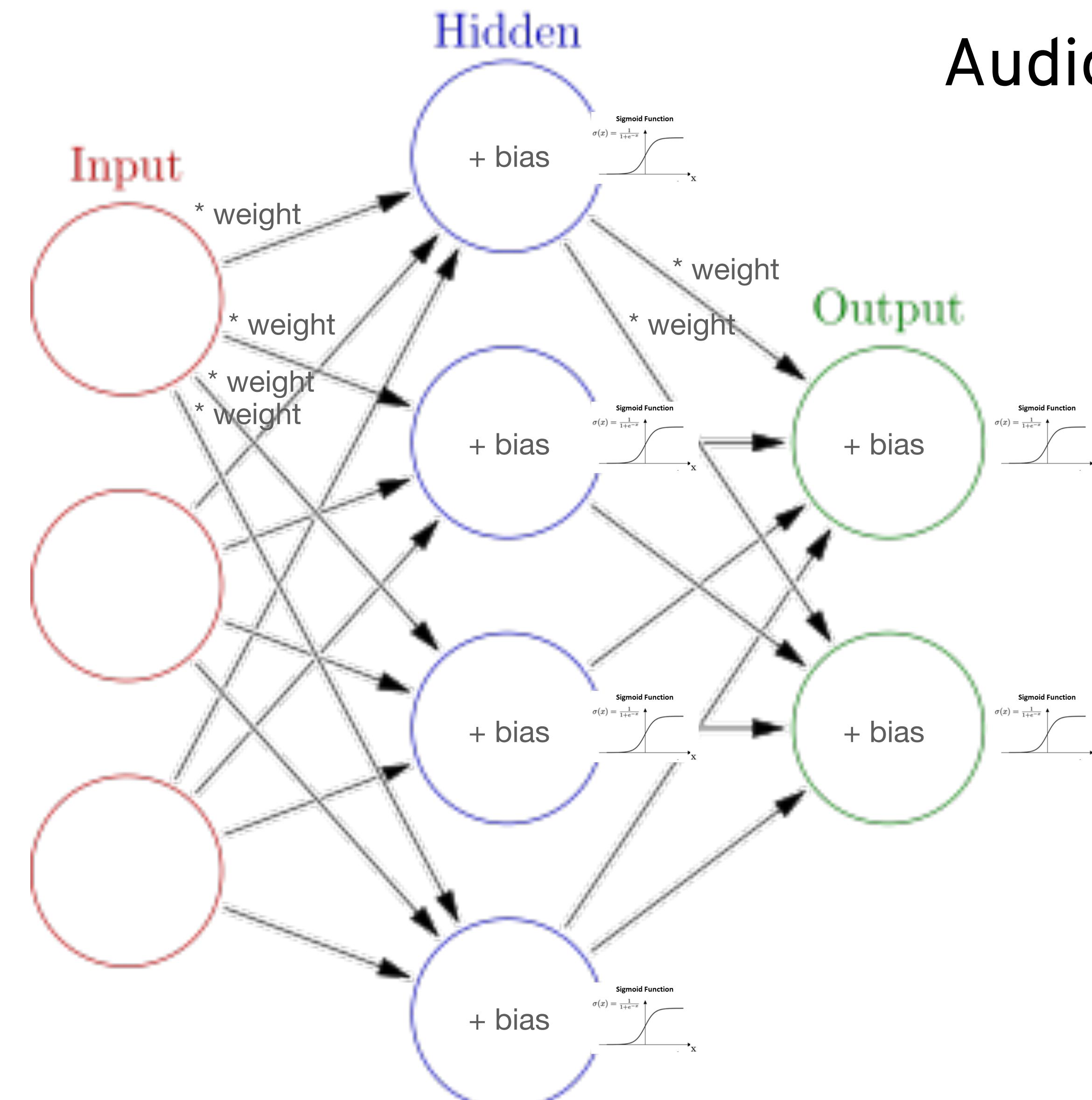
Internal Parameters

weights & biases



@activation
@outputactivation

Audio Mixer Metaphor

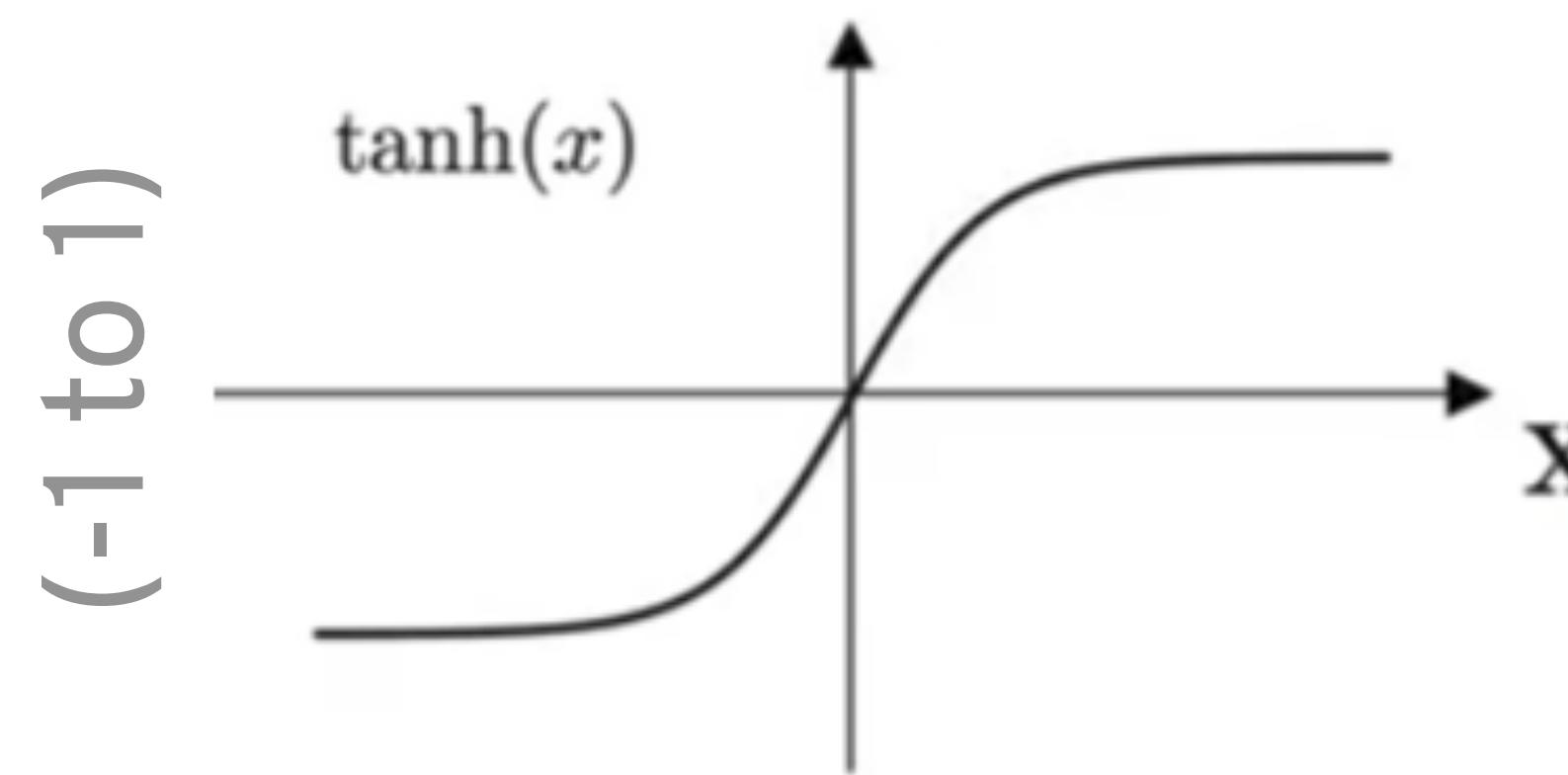


will reset network

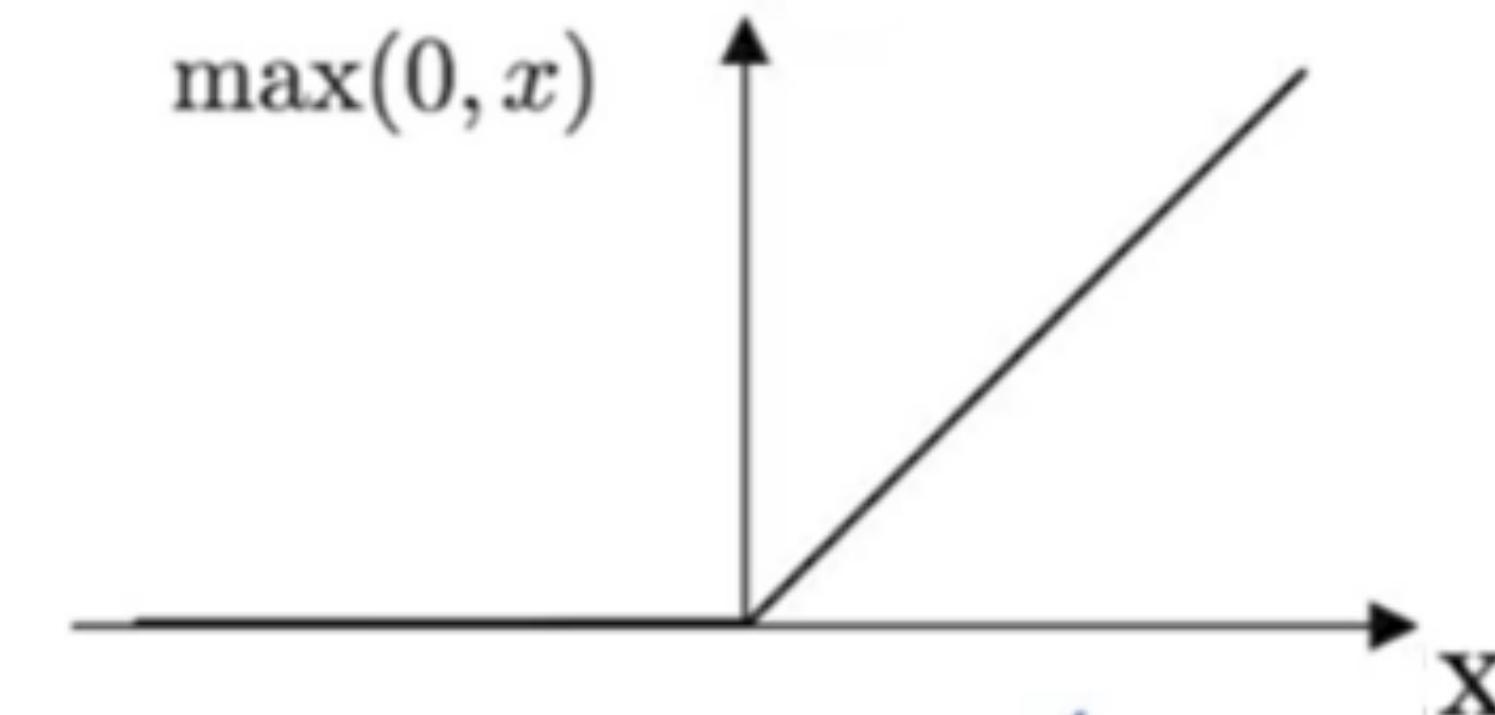
@activation

@outputactivation

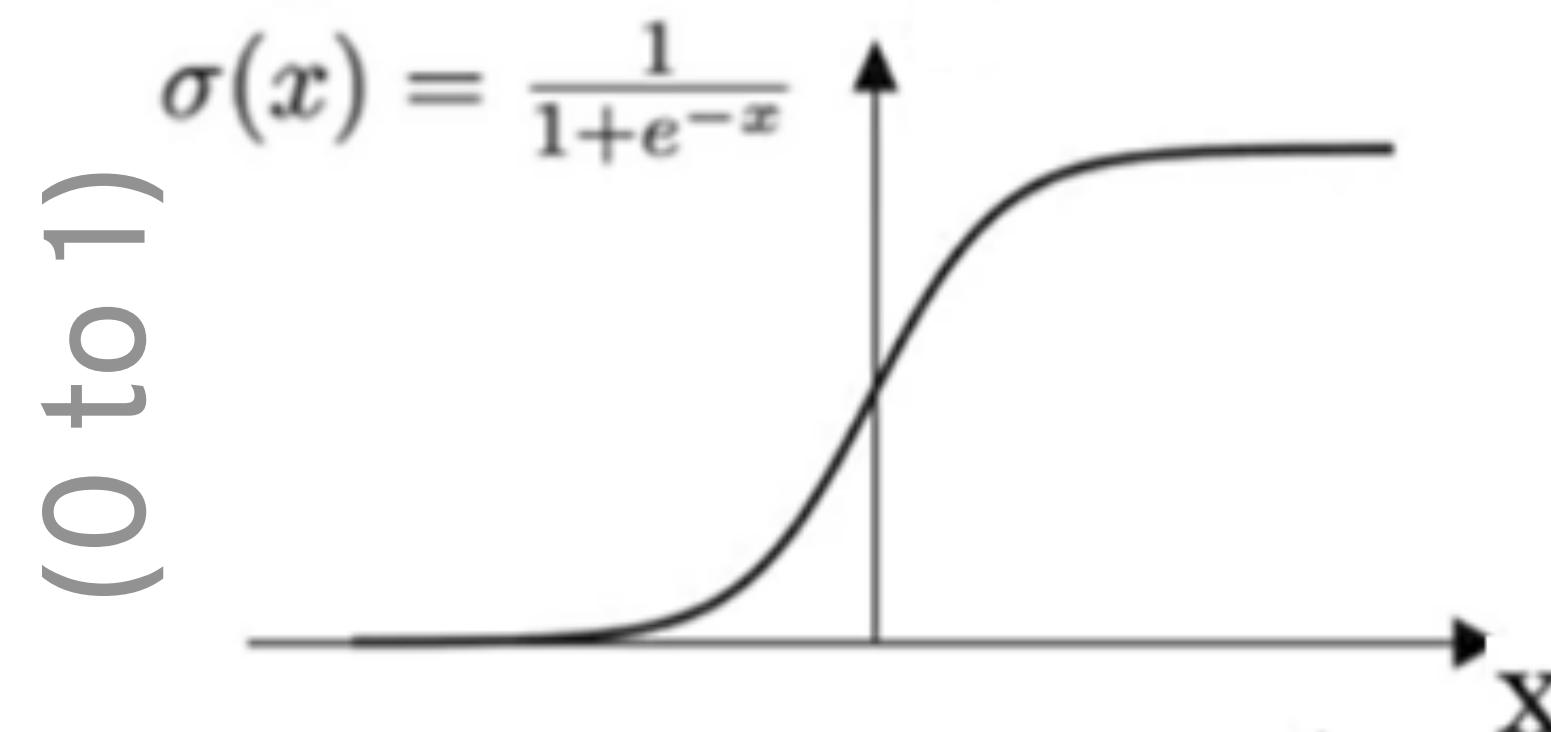
(3) Hyper Tangent Function



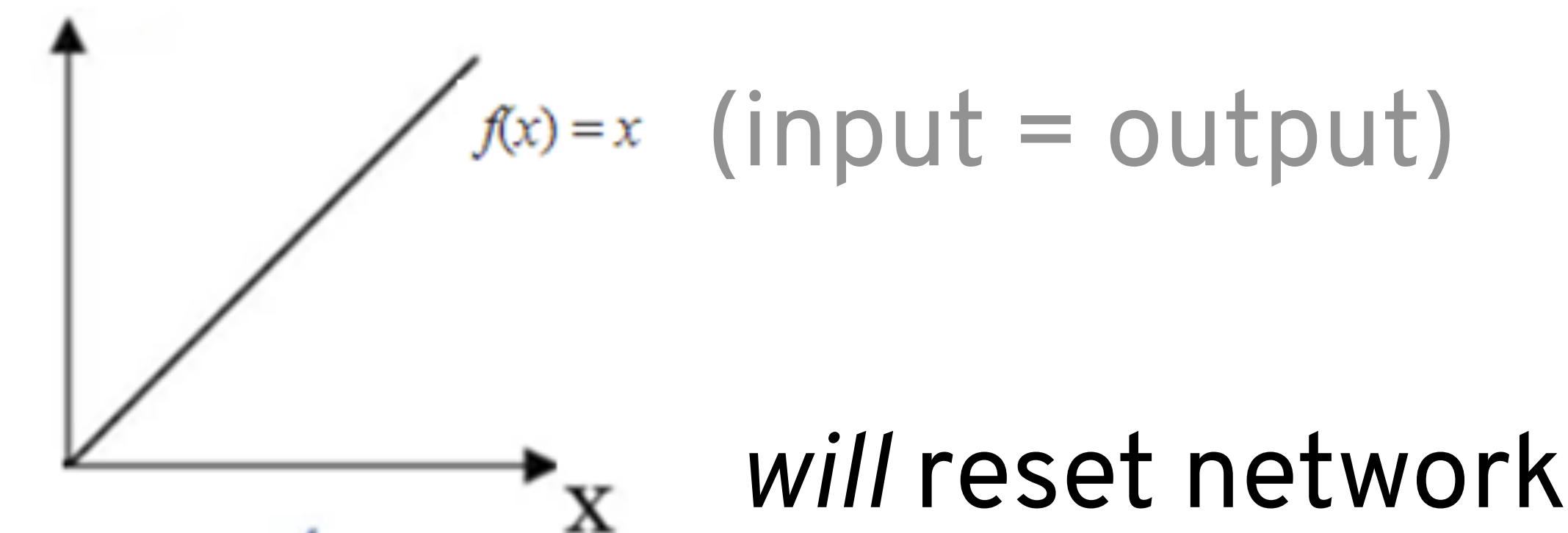
(2) ReLU Function



(1) Sigmoid Function



(0) Identity Function



`@learnrate`

a scalar for indicating how much the neural network should adjust its internal parameters during training (during back-propagation)—starting around 0.1 and decreasing over time is usually a good start

`@maxiter`

number of times to use all the examples on each “fit” message—also called an “epoch”

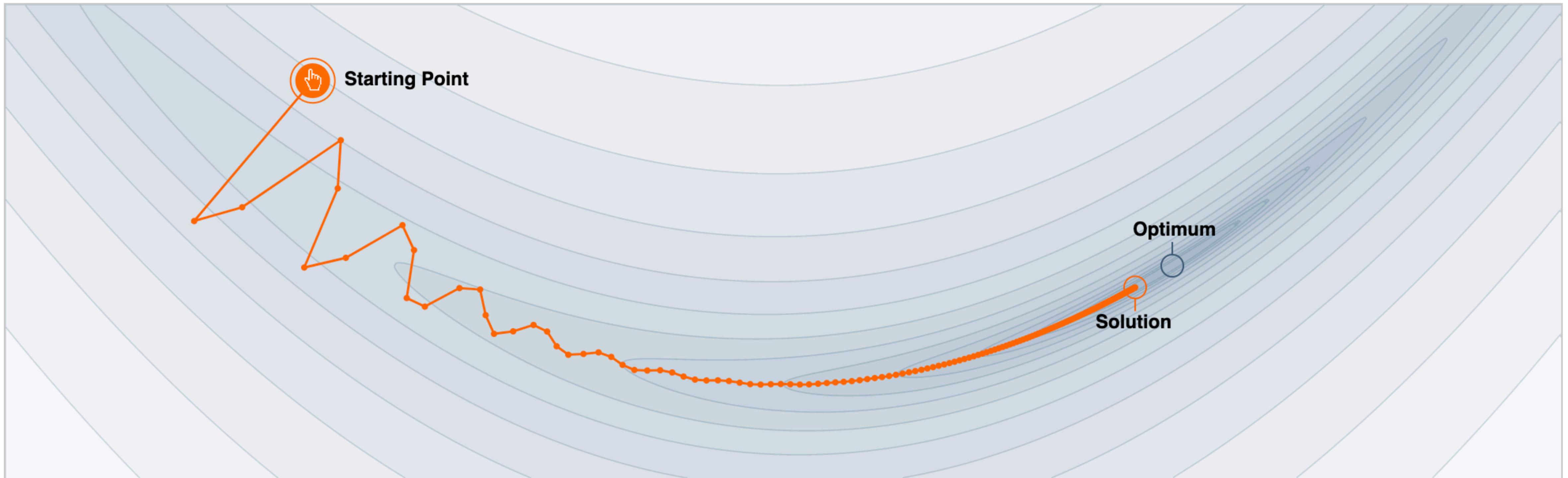
`@batchsize`

number of input examples feed-forward before checking their output pairs and adjusting

`@validation`

percentage (as a decimal) of training data to hold back (not train on) then test with—when there’s *lots* of data, may be helpful to prevent overfitting

@momentum apply smoothing adjustments



Regression with Audio Analyses

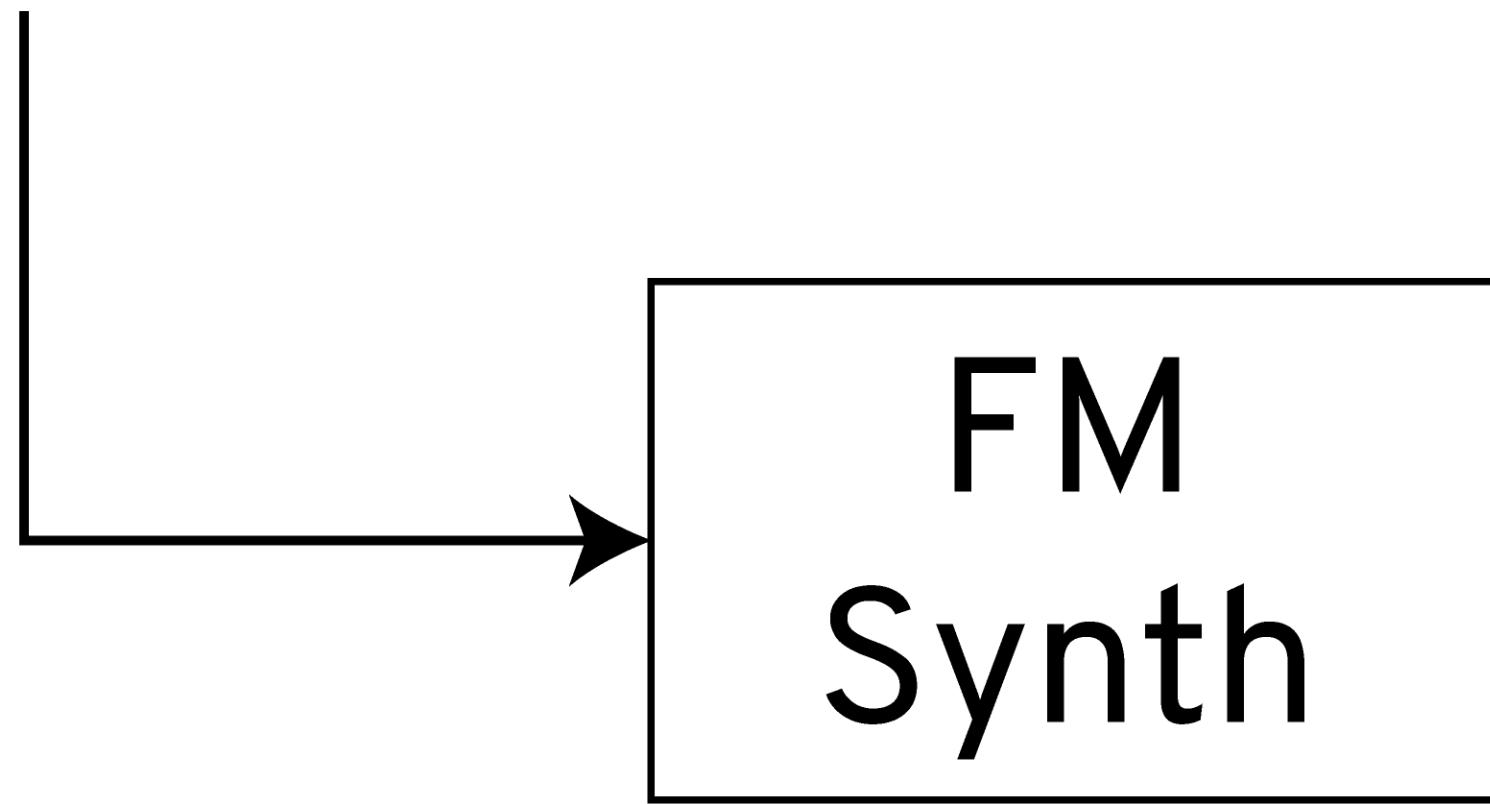


Making the Datasets

Freq. Mod. Params

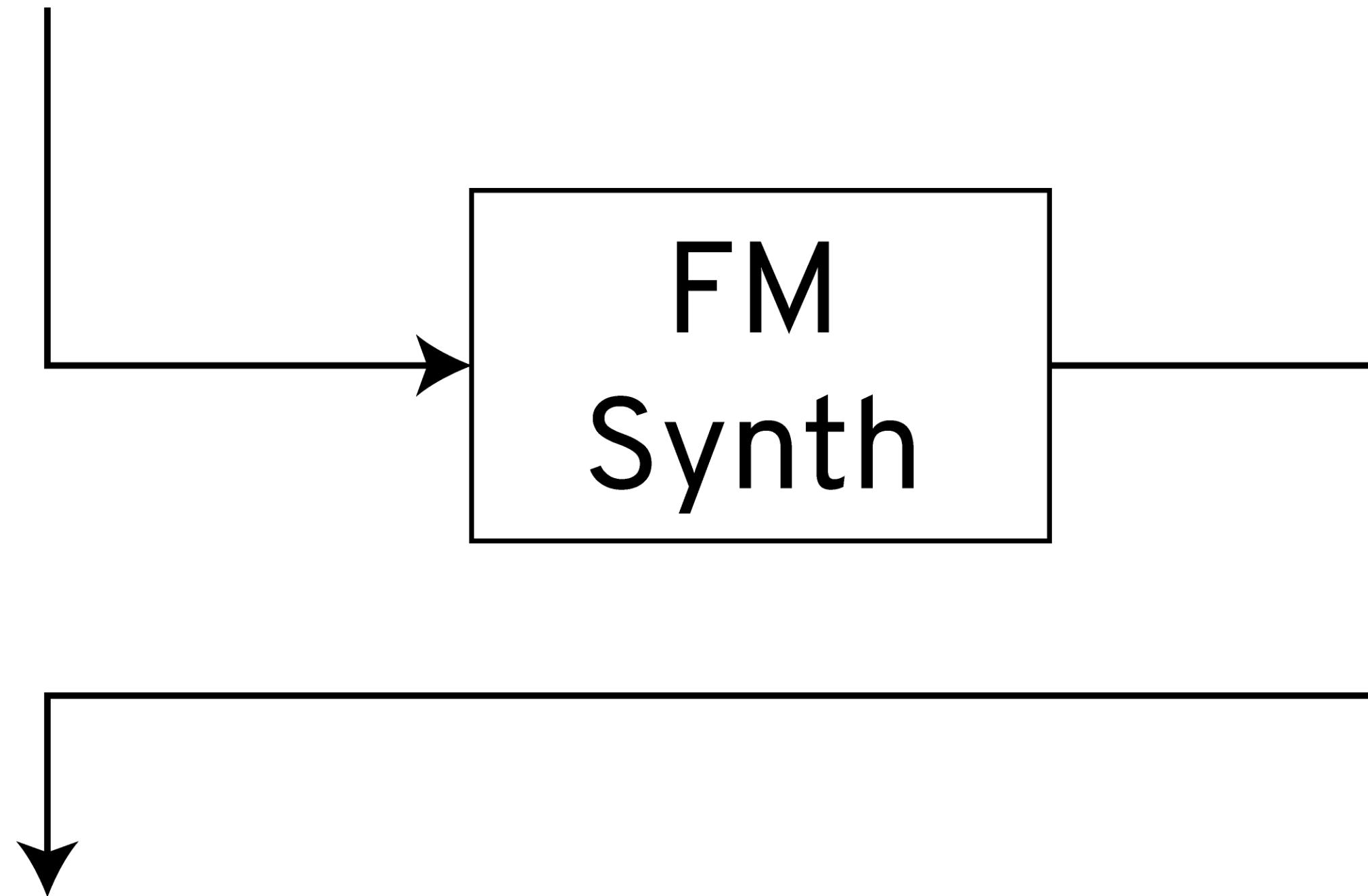
Making the Datasets

Freq. Mod. Params



Making the Datasets

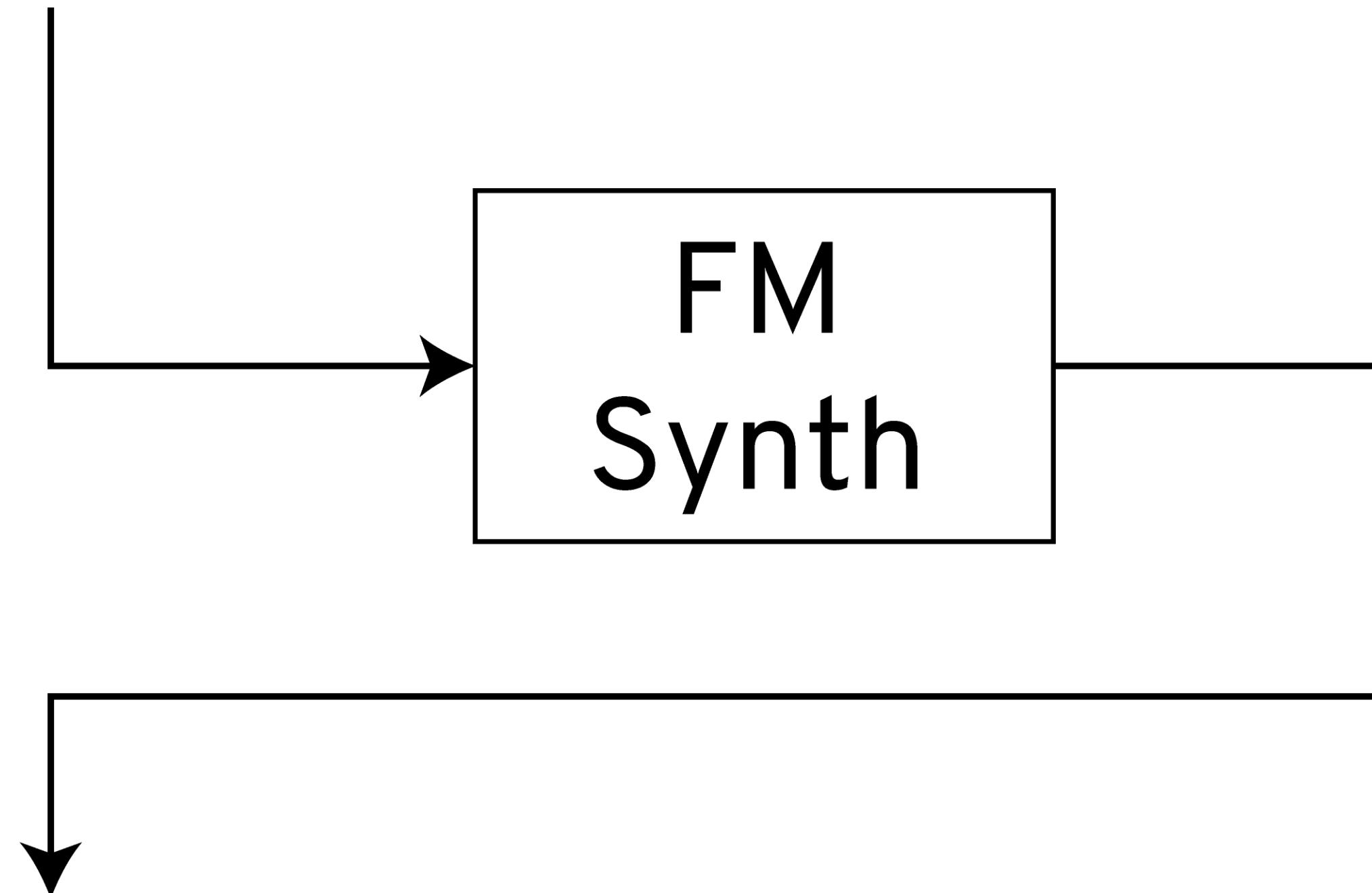
Freq. Mod. Params



Audio Signal

Making the Datasets

Freq. Mod. Params



Audio Signal —————→ 13 MFCCs

Making the Datasets

Freq. Mod. Params

13 MFCCs

Making the Datasets

Freq. Mod. Params

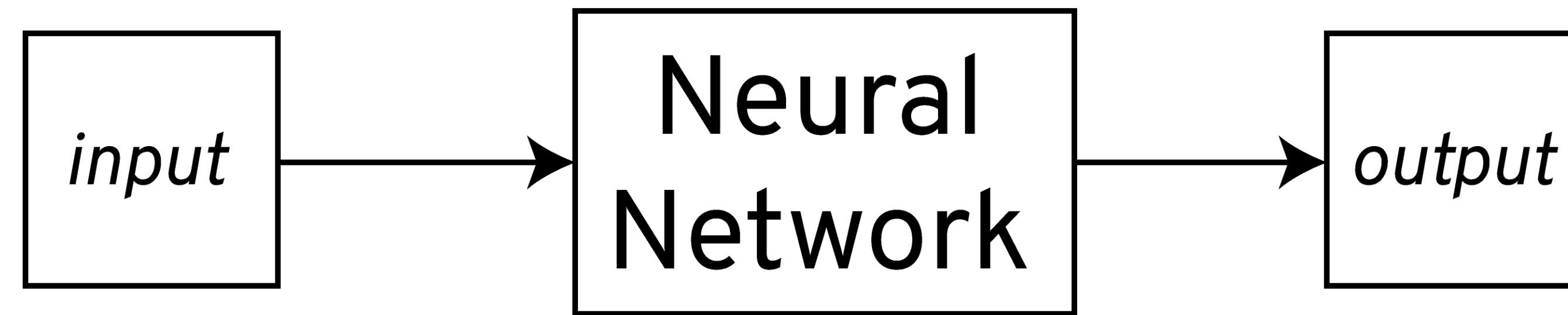
```
DataSet 64:  
rows: 100 cols: 3  
point-0      2411.1    206.48   3.9116  
point-1      69.214     65.334   3.862  
point-2      214.7     67.041   6.1554  
...  
point-97     2114.2    82.574   7.8388  
point-98     307.08    307.08   15.905  
point-99     3797.7    60.559   15.826
```

```
DataSet 63:  
rows: 100 cols: 13  
point-0      183.98    -204.99   -97.85    ...    17.116    6.7544   -2.6597  
point-1      238.64    92.367    67.025    ...    -2.1895   0.26965   3.3148  
point-2      279.43    96.95     44.27     ...    9.4531    2.0989   -1.2892  
...  
point-97     162.65    -185.08   -142.91    ...    -19.588   9.1036   14.504  
point-98     171.71    -210.44   64.047    ...    0.6732    -15.17   -8.3311  
point-99     4.409     -235.47   69.209    ...    -12.299   -6.0117   28.718
```

13 MFCCs

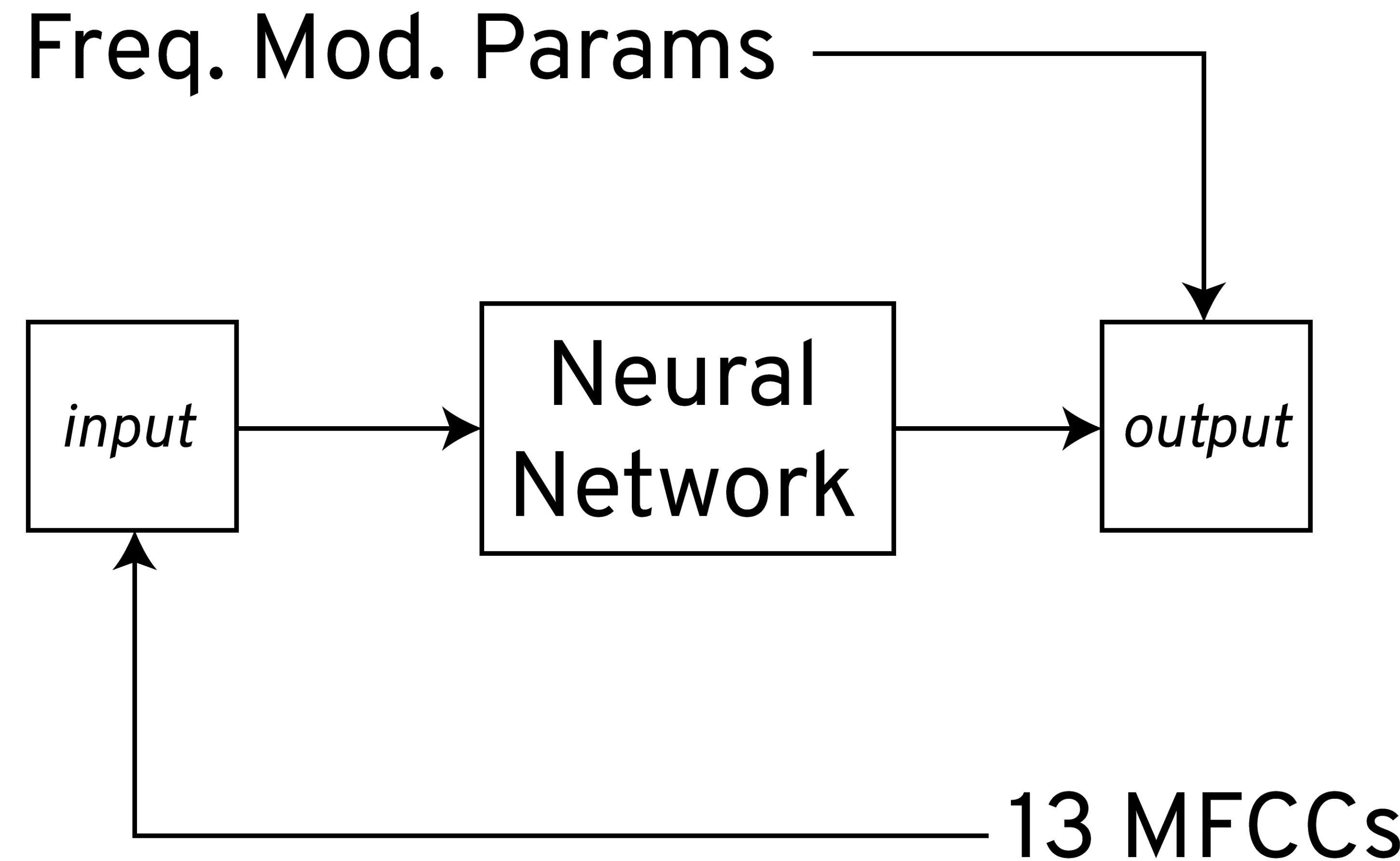
Training

Freq. Mod. Params

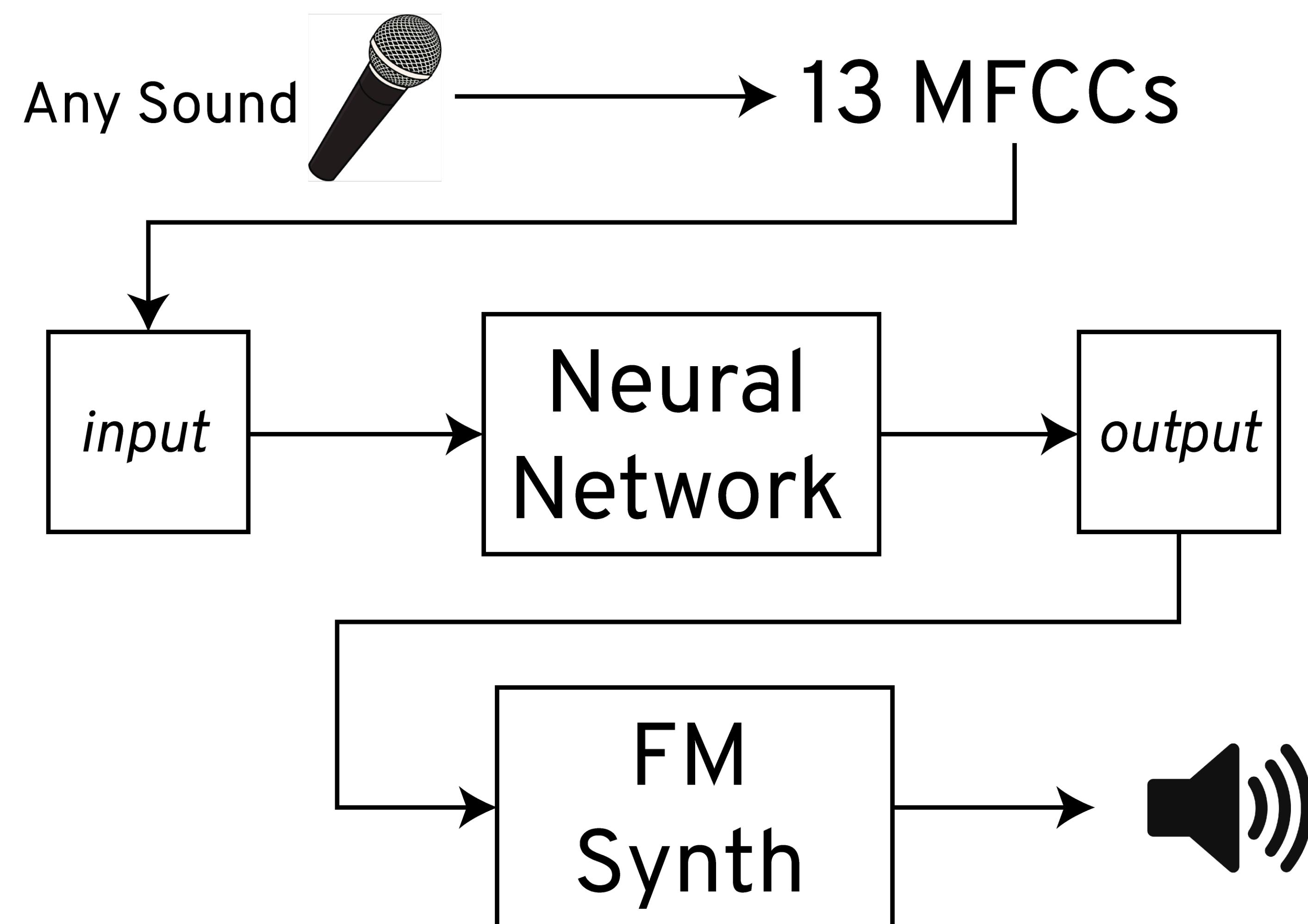


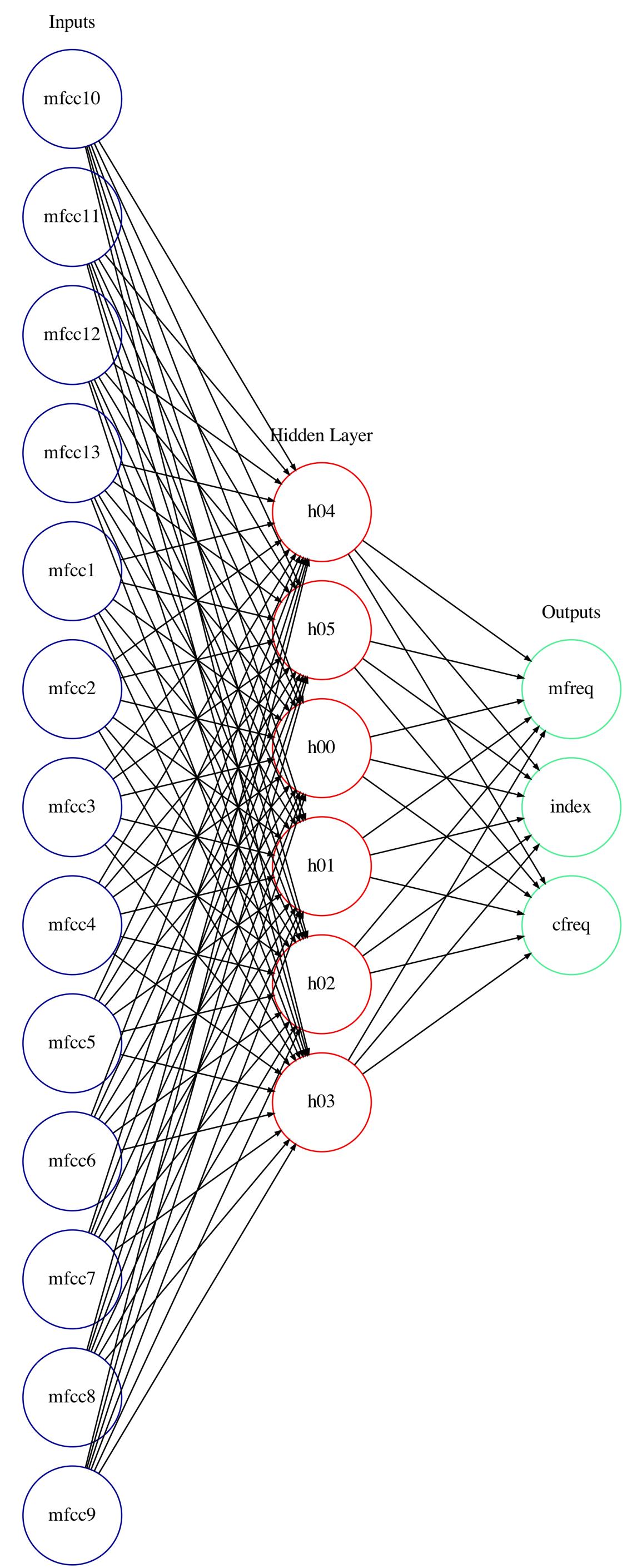
13 MFCCs

Training



Performing



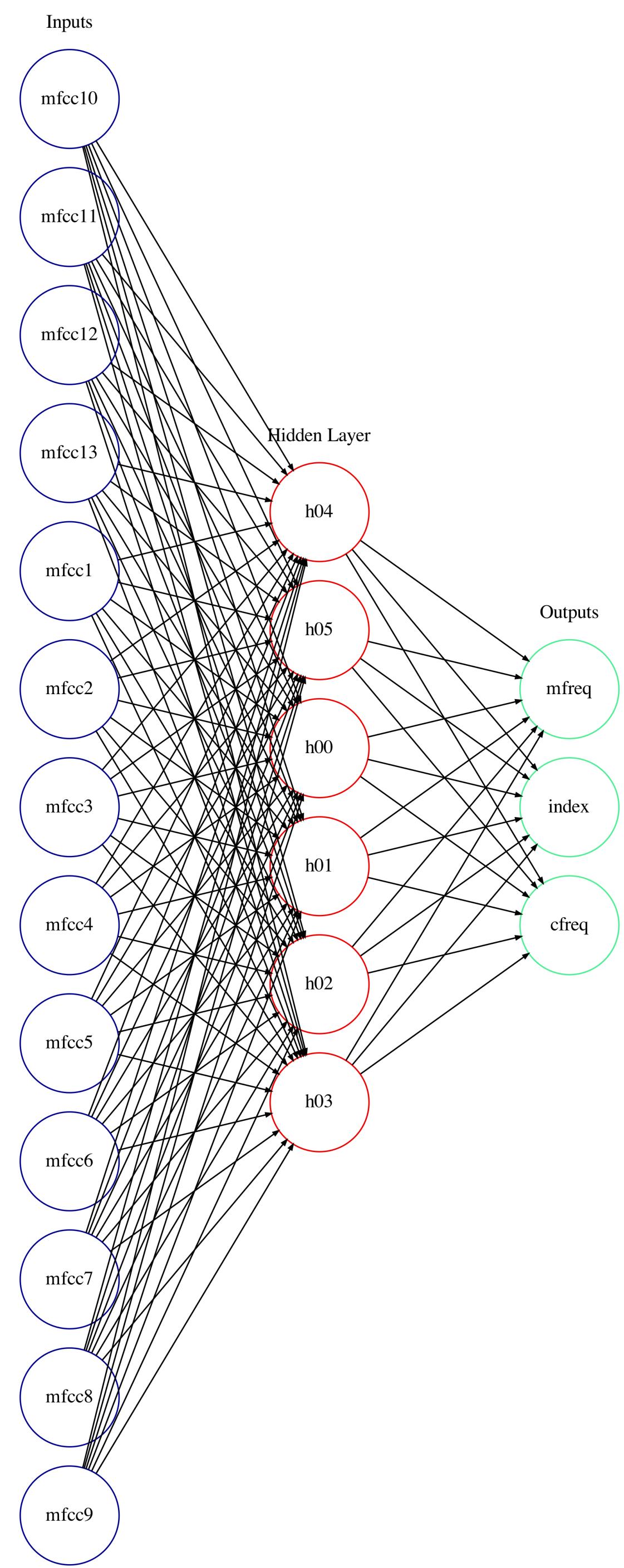




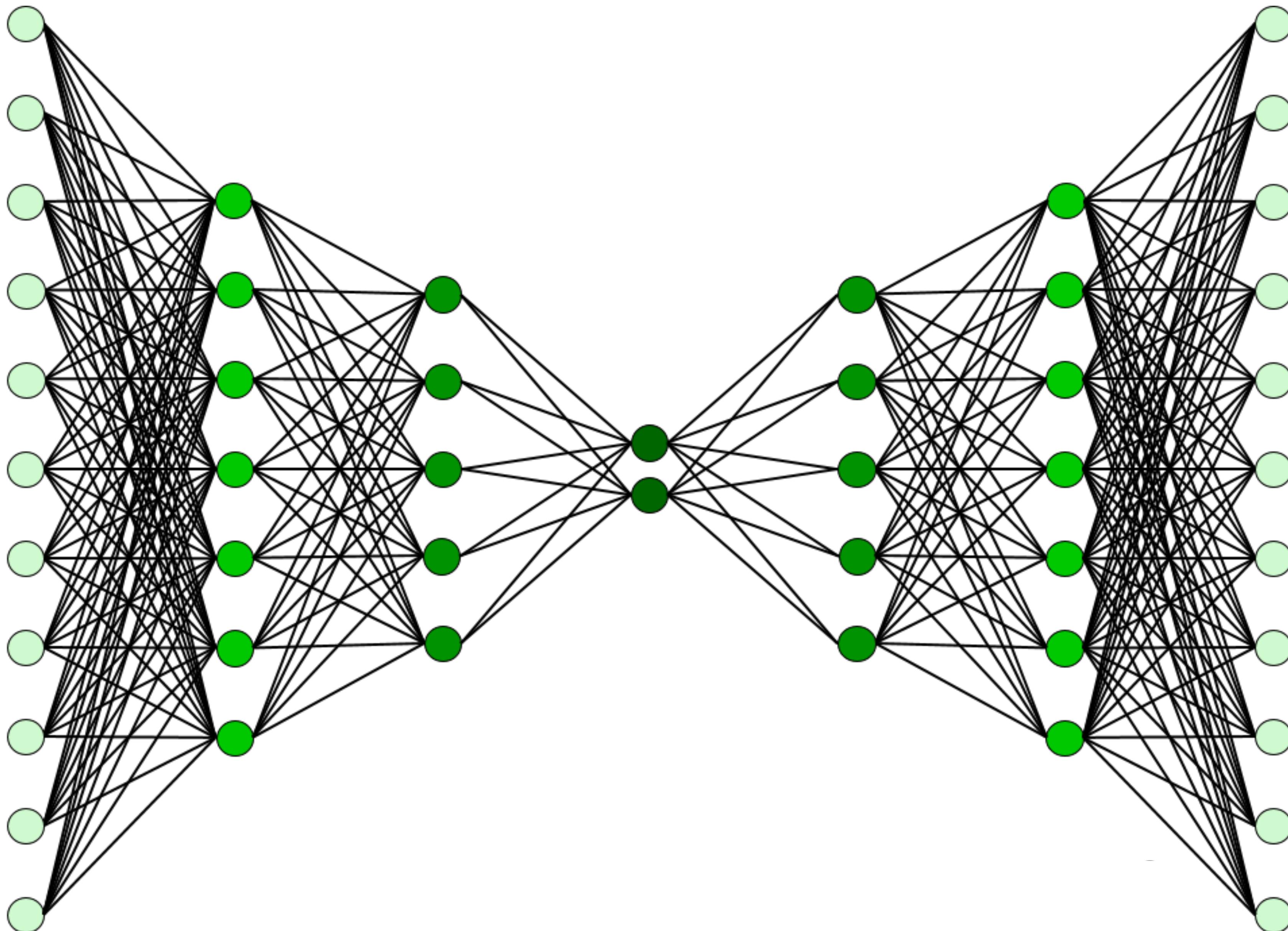
Wavetable Autoencoder

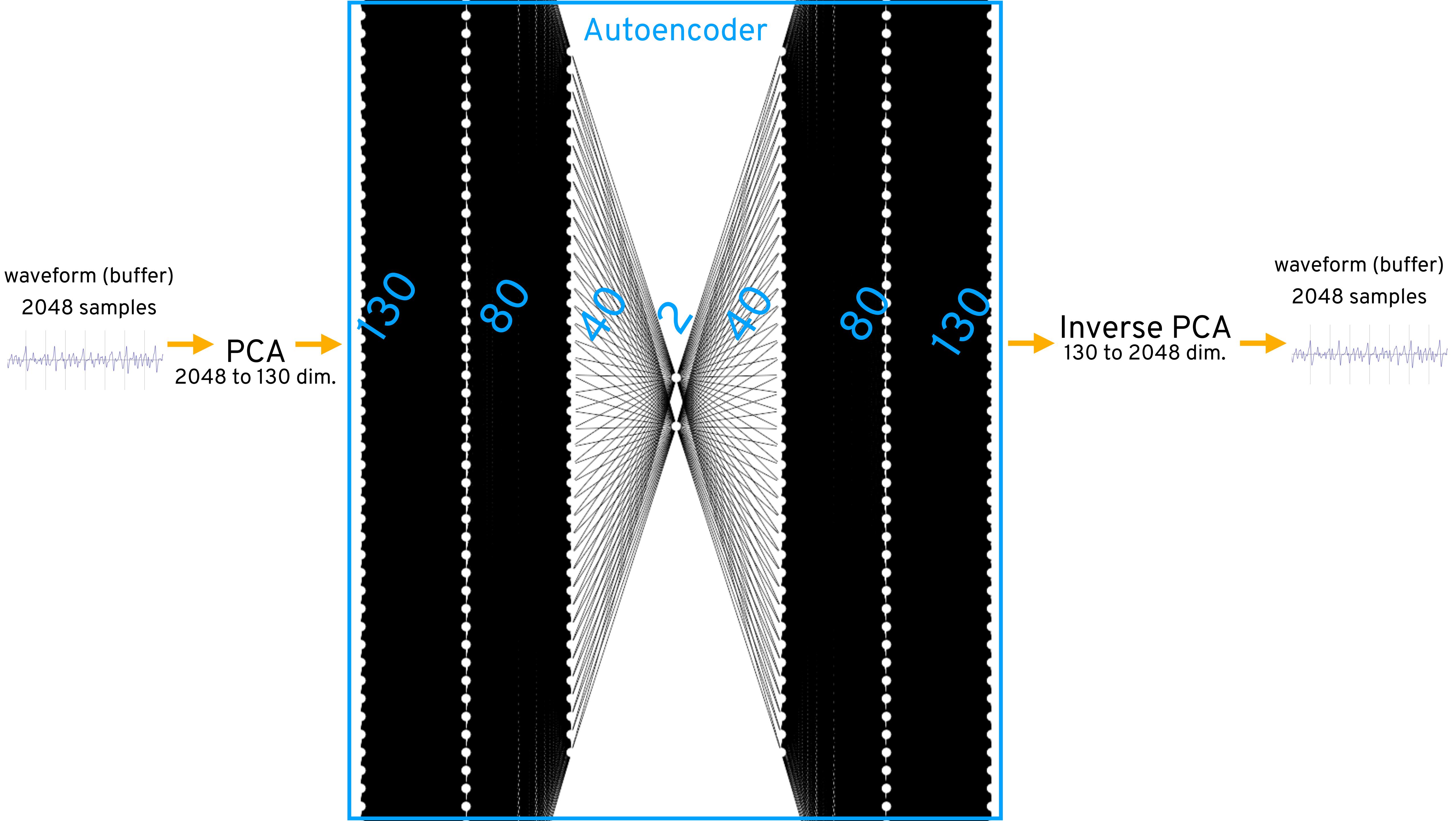


MFCCs → FM Params



Autoencoder





Supervised Learning

Learning patterns, associations, or relationships from data that is pre-labeled

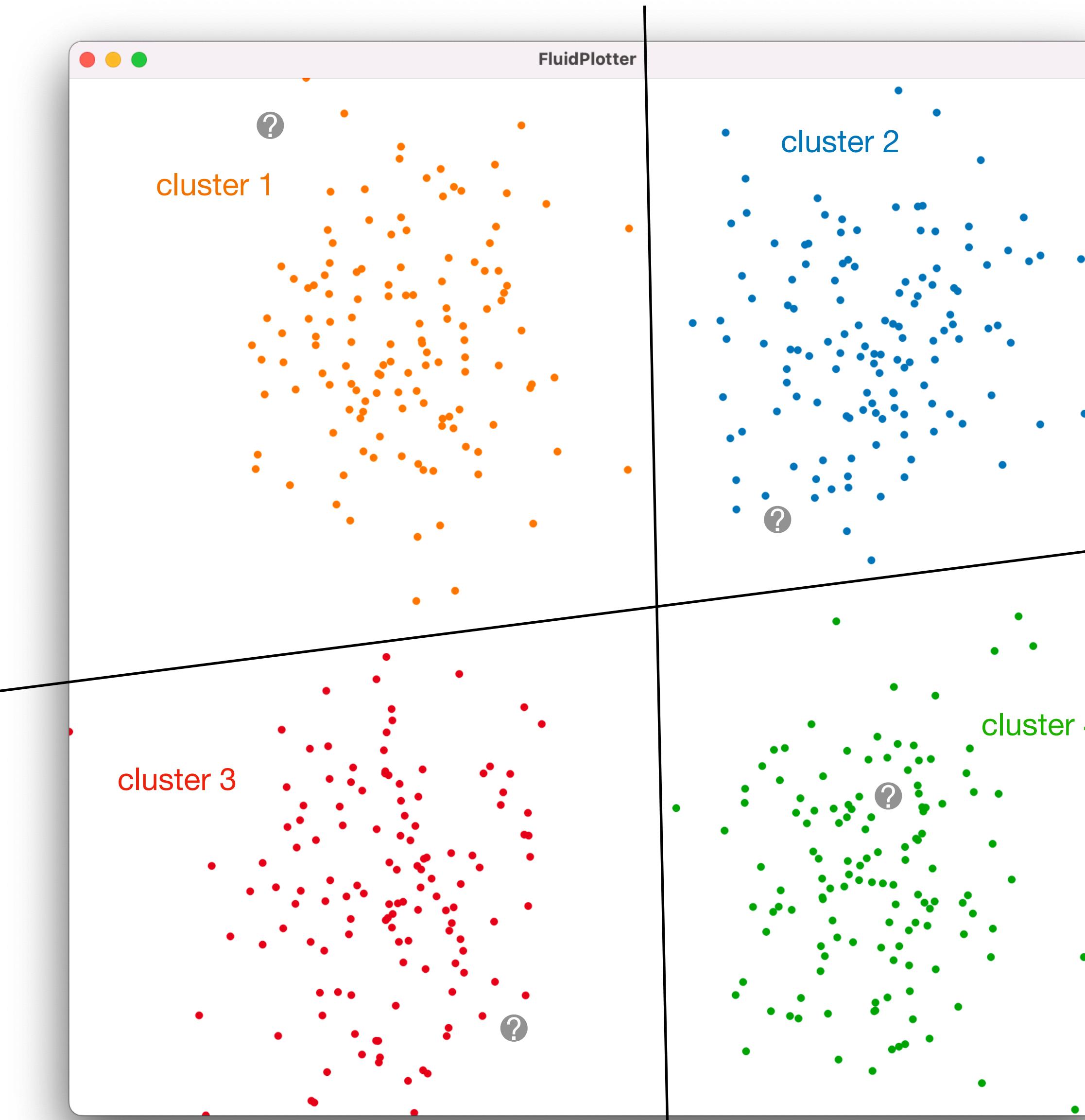


Classification
Regression

Neural Networks
KNN

Unsupervised Learning

Learning/finding patterns and relationships in data that is not labeled



Dimensionality Reduction

Clustering

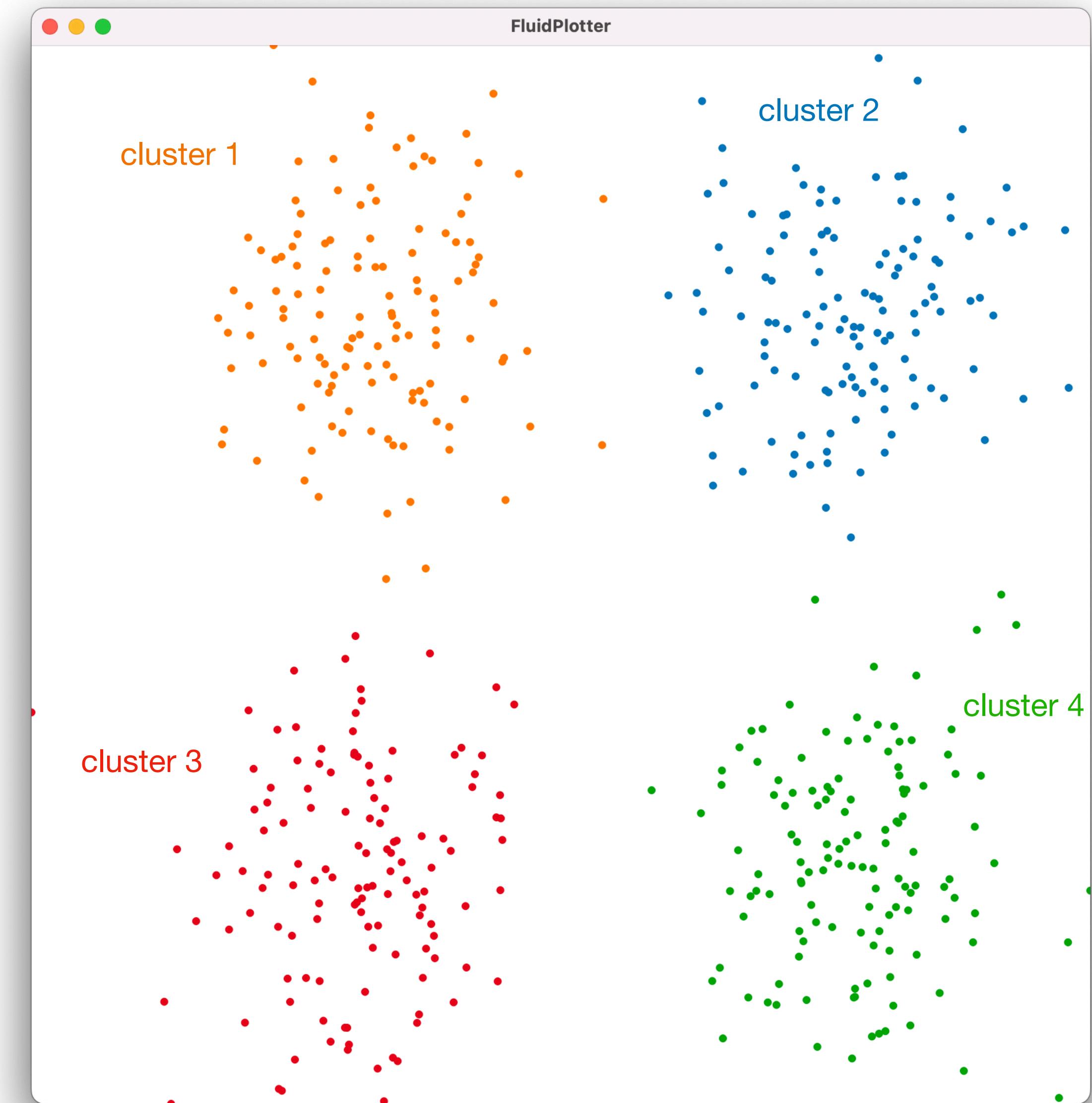
Feature Learning

KMeans

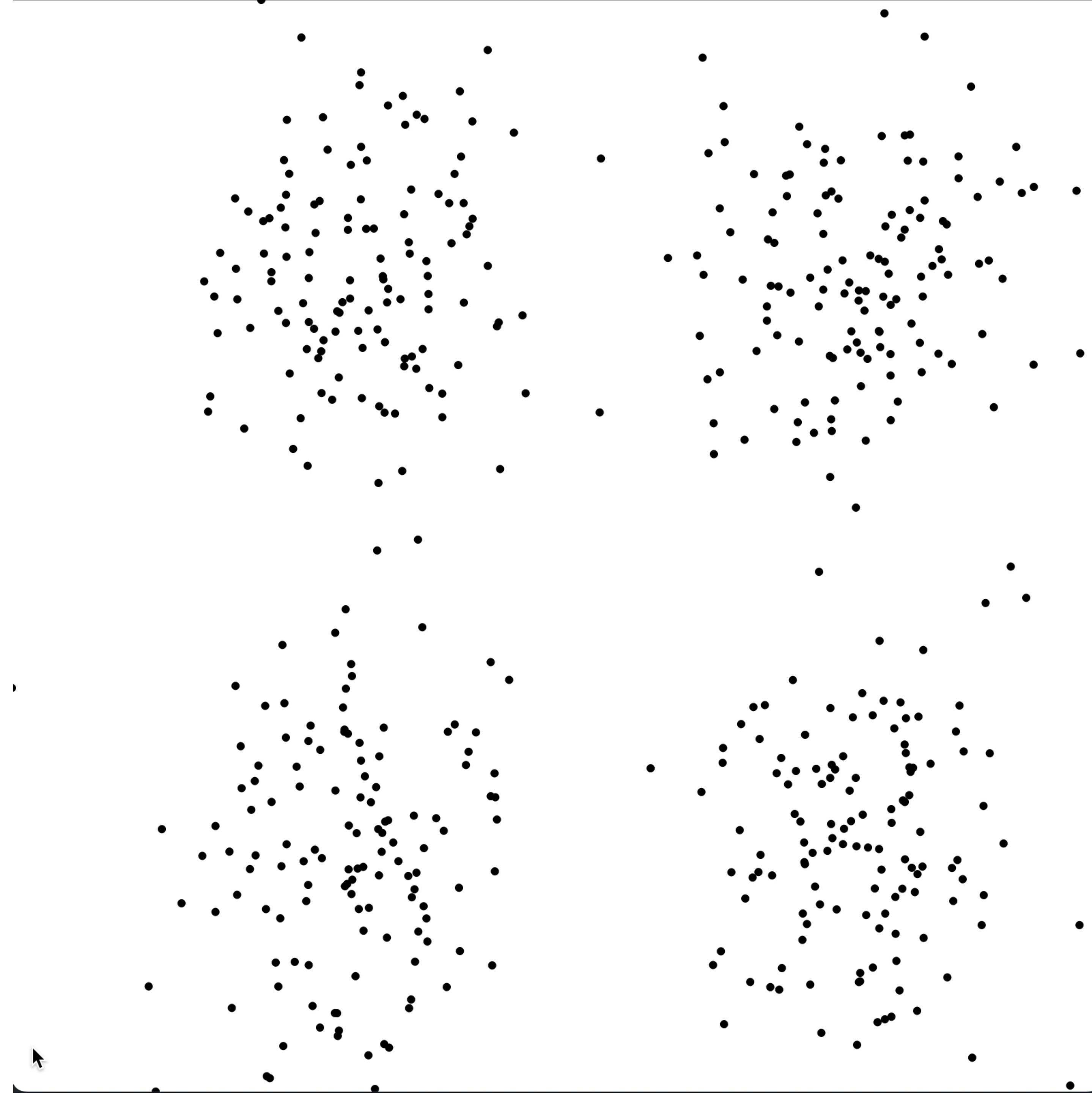


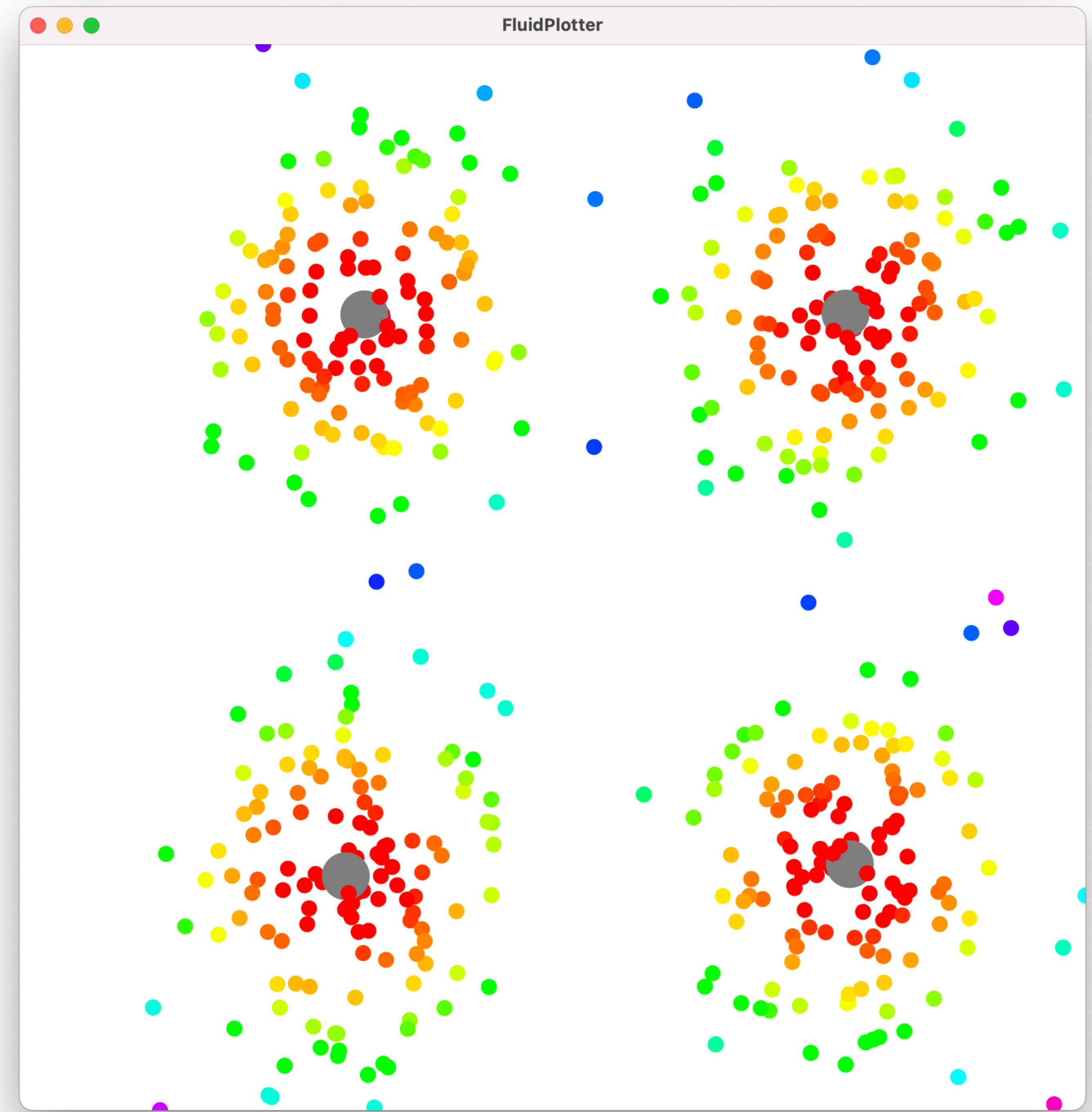
KMeans Clustering

find “clusters” of data points



Watching the iterations





flucoma.org
learn.flucoma.org



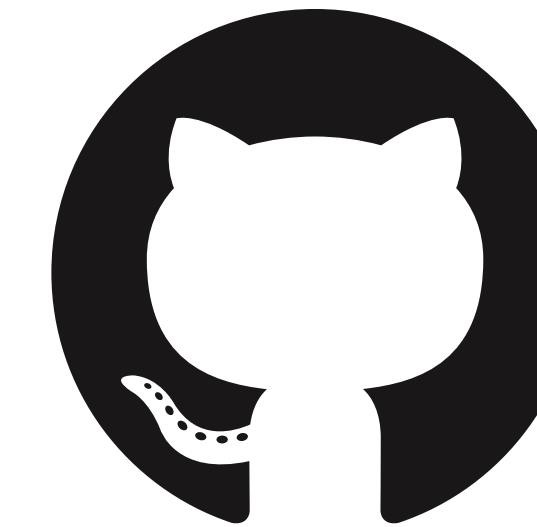
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discourse.flucoma.org



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get ideas

<https://github.com/flucoma>



bug reports
pull requests

[https://www.youtube.com/c/
fluidcorpusmanipulation](https://www.youtube.com/c/fluidcorpusmanipulation)



tutorials
performances

