Some practical experiences:

Batch Normalization

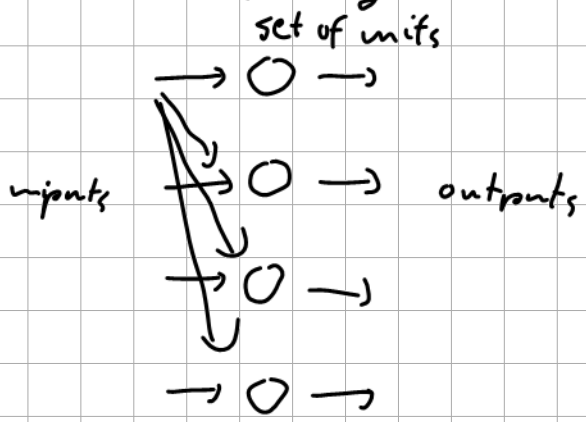
„before non-linearity" e.g. sigmoid, Leaky ReLU

```
Dense(units = 50, activation = LeakyReLU)
```

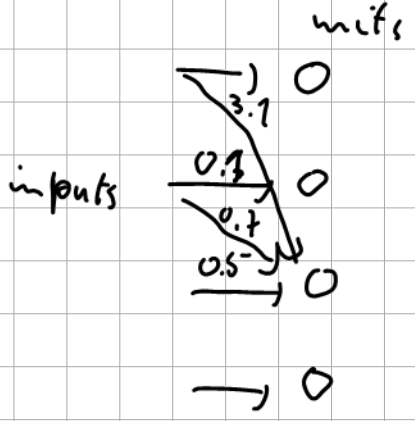
```
Dense(units = 50, activation = None),
LeakyReLU()
```

Dropout

typically use a Dropout layer after a Nonlinearity.



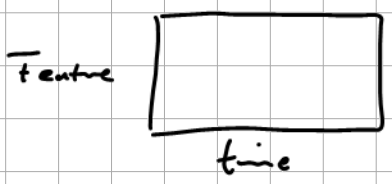
Regularizers



L_1: $L = L + \sum_{i,j} |w_{j,i}|$

L_2: $L = L + \sqrt{\sum_{i,j} |w_{j,i}|^2}$

audio → MFCC Feature → 20 Matrices = Images → usage of typical image classification network



Chapter 4 | 5

Exam Preparation

$x(n) \rightarrow \boxed{h(n)} \rightarrow y(n) = h(n) * x(n)$

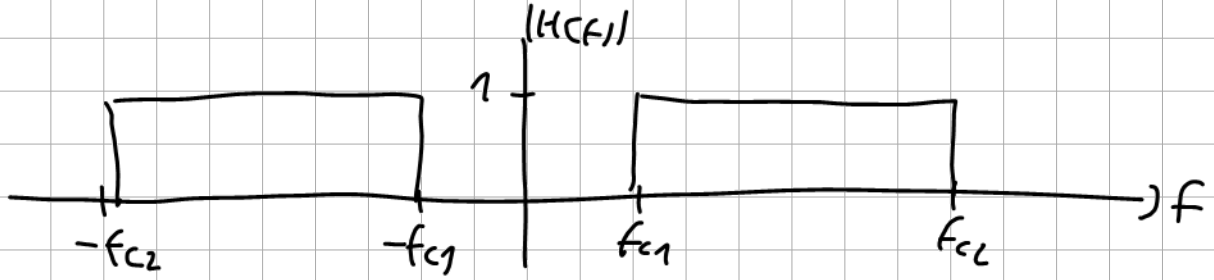
$$\underline{Y}(f) = \underline{H}(f) \cdot \underline{X}(f)$$

$$\underline{X}(f) = \frac{\underline{Y}(f)}{\underline{H}(f)} \qquad |\underline{H}(f)| > 0$$

ideal Bandpass

$f_{c1} = 500$ Hz

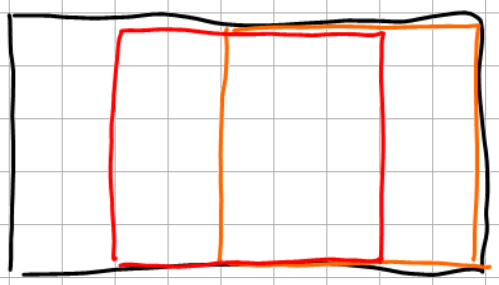
$f_{c2} = 5000$ Hz



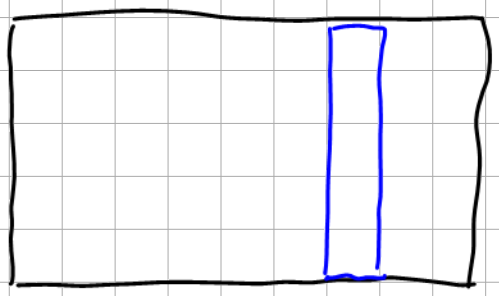
Narrow band: $f_{c1} = 300$ Hz $\quad f_{c2} = 3400$ Hz

Wide band: $f_{c1} = 50$ Hz $\quad f_{c2} = 7000$ Hz

Input
Log Mel Spektrogram
Narrowband Signal

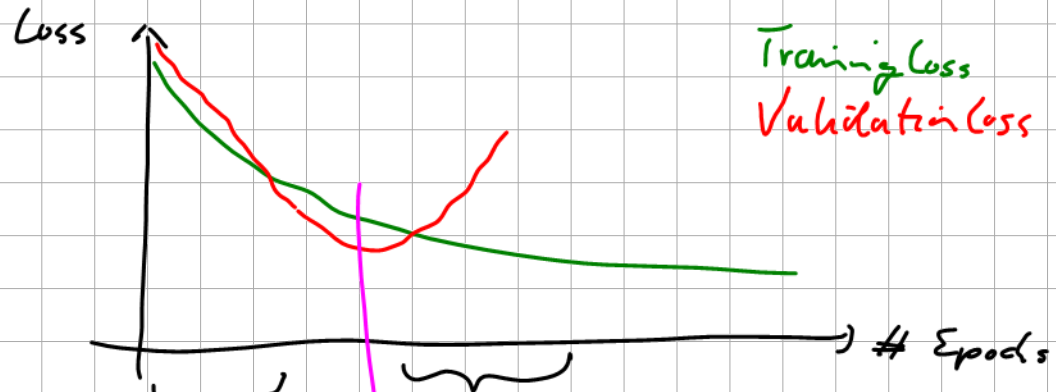


Output
Log Mel Spektrogram
Wideband Signal



$t \rightarrow$

Normal training



Underfitting
⇒ Network has not finished training

Overfitting
⇒ Network is much too specialized

point for stopping training