Group	Name	53	54	55	56	57	58	59	$\sum$
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Technical Neural Networks Assignment Sheet 9

December 2022

Assignment 53

Assignment 54

VC-capacity h of a binary classifier means that it can create 2^h labelings. If $2^h \leq 1000$, then $h = 9$.

Assignment 55

Binary classification is a task of finding right parameters α such that classifier function f_α can perform the right mapping from input training patterns X to desired outputs $y \in \{-1, 1\}$: $f_\alpha(X_i) = y_i$.

Assignment 56

Assignment 57

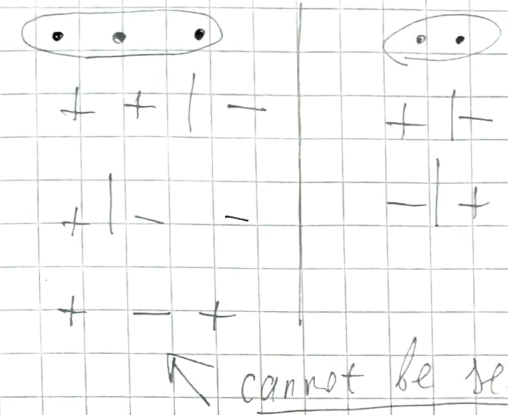
The two hyperplanes are parallel, have the same slope. The distance between them is equal to $2|b|$.

Assignment 58

Assignment 59

Assignment 53

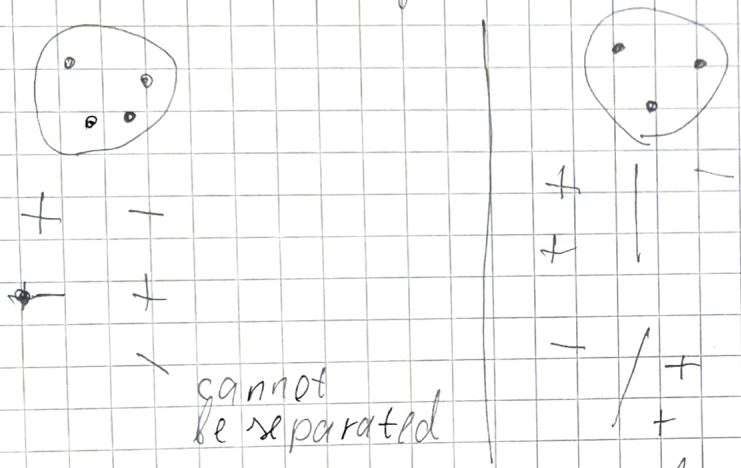
Starting with linear boundary classification for 19



here $h = 2$

cannot be separated

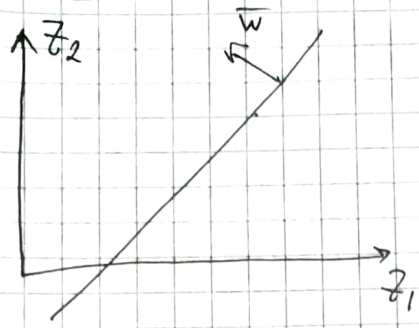
Linear boundary classification for 29



cannot be separated

VC dimension is the biggest set of points that can be separated (see examples). It does not depend on the input distribution space

Task 56



$|\bar{z}|\ (\bar{w} \cdot \bar{z}) + b = 0$

Canonical form of a hyperplane:

$H = \{\bar{z} \mid < \bar{w}, \bar{z} > + b = 0\}$, $N = 2$

$w_1 z_1 + w_2 z_2 + b = 0$

$w_2 z_2 = -w_1 z_1 - b$

$z_2 = -\frac{w_1}{w_2} z_1 - \frac{b}{w_2}$

Task 59

Gilbert's algorithm: computes the euclidean distance $d(A,B)$ between 2 convex objects A, B. With the euclidean distance: $d(A,B) = \min\{\|x-y\| : x \in A, y \in B\}$

The algorithm returns 2 closest points $a \in A$, $b \in B$, It computes the distance between the origin and the Minkowski difference $C = A - B$, which is equal to the desired outcome