

Maximise recall s.t. constraint on precision

Pseudocode

Row #

- 1 Input: $\bar{x} = (\bar{x}_1, \dots, \bar{x}_n)$, $\bar{y} = (y_1, \dots, y_n)$, C , ϵ , \bar{y} , P
vector of covariates for patient n
vector of labels
penalty on constraint violation
tolerance
set of admissible label vectors.
min precision
- 2 Initialise \bar{w}
- 3 $C \leftarrow \emptyset$ (empty set) [C is the set of constraints]
- 4 Repeat
 - 5 $(i_1^p, \dots, i_{\#pos}^p) \leftarrow \text{sort } \{i: y_i = 1\}$ by $\bar{w}^T \bar{x}_i$ Indices of positives.
 - 6 $(i_1^n, \dots, i_{\#neg}^n) \leftarrow \text{sort } \{i: y_i = -1\}$ by $\bar{w}^T \bar{x}_i$ Indices of negatives.
 - 7 for $a \in [0, \dots, \#pos]$ do
 - 8 $c \leftarrow \#pos - a$
 - 9 set $y_{i_1^p}^c, \dots, y_{i_a^p}^c$ to 1
 - 10 set $y_{i_{a+1}^p}^c, \dots, y_{i_{\#pos}^p}^c$ to -1
 - 11 for $d \in [0, \dots, \#neg]$ do
 - 12 $b \leftarrow \#neg - d$
 - 13 set $y_{i_1^n}^d, \dots, y_{i_b^n}^d$ to 1
 - 14 set $y_{i_{b+1}^n}^d, \dots, y_{i_{\#neg}^n}^d$ to -1
 - 15 If $\frac{a}{a+b} \geq P$ then
 - 16 $V \leftarrow 100 \left(1 - \frac{a}{a+b}\right) + \bar{w}^T \sum_{i=1}^n y_i^c \bar{x}_i$
 - 17 Else
 - 18 $V \leftarrow 100 + \bar{w}^T \sum_{i=1}^n y_i^c \bar{x}_i$
 - 19 End if