| Ensemble Le  | arming and a second  |                   |  |
|--|---|-------------------|--|
|  |   |                   |  |
| Idea: Constru  | et a classifier Hux) that combines the individual o   | recisions him ht  |  |
| AdaBoost   |   |                   |  |
|  | s a lot of "weak leavers" to make dassification   |                   |  |
| 2. Some un   | weak leaver get more say in the classification than others  |                   |  |
| 3. Each me   | ak leaver is made by taking the previous weak   | leaver's mistakes |  |
| into a   | vaut 0 0 1  |                   |  |
| Into a   |   |                   |  |
| Each Sample  | has a "maight" or importance score. At the start,   | all samples       |  |
| get the San  | A LANG-TAIAL  |                   |  |
|  | e weight. By  | (5 shaped)        |  |
| Pt   |   | (S shaped)        |  |
| Amount of s  | ay = I log (1- total From   |                   |  |
| of the th class  | ay = I log ( 1 - total Fmx ) inficulturent )  |                   |  |
| 1,1,2,0,0,1  | 0.5   | 6+                |  |
| E+F [n.  | 1, (t ∈ (-∞, +∞)  | e <sub>t</sub>    |  |
| C C O L O S  | 1, [ ( 6 ( - \infty, 7 \infty)  |                   |  |
|  |   | the Sauple        |  |
| Update all sample weights based on if the current classifer (week) misclassifies $W_{t+1}$ , $i = W_{t+1}$ ; $exp(-\beta y; ht(x;))$ |   |                   |  |
| $\omega$   | $t+1$ , $i = Wt$ ; $exp(-\beta y; ht(x;))$  |                   |  |
|  |   |                   |  |
| if yi=h+   | $x_i) \Rightarrow h_t(x_i) \cdot y_i = 1 \Rightarrow w_{t,i} \cdot e^{\theta} \Rightarrow e^{\theta}$<br>$x_i) \Rightarrow h_t(x_i) \cdot y_i = -1 \Rightarrow w_{t,i} \cdot e^{\theta} \Rightarrow e^{\theta}$ | V when P1         |  |
| if yi \$h+c  | $xi) \Rightarrow h + (xi) \cdot yi = -1 \Rightarrow w + ii \cdot e^{\beta} \Rightarrow e^{\beta}$   | 1 when G1         |  |
| , ()   |   |                   |  |
| le   | 1,el Hirl - oran  | 7 Pelin           |  |
|  | H(x) = Sign   | t=1               |  |
|  | PP  |                   |  |

| Passion will largichted Turken or  |   |
|--|---|
| Training with Weighted Instances.  |   |
| Jing (8) = - I w; [y; log ho (x;) + (1-y; ) log (1-ho (x;))] + 7 11 6112   |   |
|  |   |
| Basically, prioritize Samples with larger weights >  |   |
| Basically, prioritize Samples with larger weights >>  prioritize samples that have been misclessified repeatedly |   |
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