Learning as a redirection of the weight vector

We now can think of a 'learning step'(i.e., the modification of the weights by the presentation of a single pattern-target combination), as *a realignment of the weight vector so that it will generate an appropriate inner product for that pattern* (very positive if the target is +1 and very negative if the target is -1). After learning from all the training patterns, the final weight vector should be "directed" in such a way that it yields a large, positive inner product for all the patterns that had a +1 target. *Graphically, it means that after training the weight vector should "point" to the cluster of training patterns from the "ON" (t = +1) class.*

When learning from an input pattern + target the learning algorithm may:

1) change the weights (and bias)

2) Re-direct the weight vector, w

3) "wiggle" the (linear) Decision Boundary (DB)

$n = 0 \rightarrow$ "critical" value of n

$$p_1 w_{11} + p_2 w_{12} + b = 0 \rightarrow P_2 = \left(\frac{-w_{11}}{w_{12}}\right) p_1 + \left(\frac{-b}{w_{12}}\right)$$

SLOPE CHG.   INTERCEPT CHG

4) INCREASE PROJECTION/ALIGNMENT (dot prod.) with current training pattern, if its target is "+1".