

⑥ We want to estimate α using a trained Classifier h and a held-out validation Set V .

$$V_+ = \{x^{(i)} \in V \mid y^{(i)} = 1\}$$

$$h(x^{(i)}) \approx P(y^{(i)} = 1 \mid x^{(i)})$$

Show that,

$$h(x^{(i)}) \approx \alpha \quad \forall \text{ all } x^{(i)} \in V_+$$

You may assume $p(t^{(i)}=1 | x^{(i)}) \approx 1$

When $x^{(i)} \in V_+$

$$\Rightarrow \forall x^{(i)} \in V_+$$

$$h_0(x) \approx P(y^{(i)}=1 | x^{(i)})$$

$$\approx \alpha P(t^{(i)}=1 | x^{(i)})$$

$$\approx \alpha //$$