Decision analysis of toy NAO

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Abstract

Abstract TK

Contents

1 Model

Hypotheses: $H \in \{\text{threat}, \text{not-threat}\}$
Data stream: $\{X_1, X_2, \ldots\}$.
Likelihood function: $p(x|h)$
Loss function:

$$
L_i = \begin{array}{c|cc}
 & \text{not-threat} & \text{threat} \\
\text{flag} & c & 0 \\
\text{wait} & L_{i+1} & d + L_{i+1}
\end{array}
\tag{1}
$$

Threshold posterior: $p_{\text{thresh}} = \text{argmin}_{p_t} \mathbb{E}\{L_0(p_t)\}$
Prior: $p_0 = \mathbb{P}\{H = \text{threat}\}$
Posterior: $P_i = \mathbb{P}\{H = \text{threat}|X_1, X_2, \ldots, X_i\}$

Updates:

$$P_{i+1} = \frac{P_i}{\underline{\quad}} \tag{2}$$

2 Expected losses

3 Optimal decision threshold

4 Discussion