Podejmowanie decyzji

18/20 października 2017

1 Zadania z wykładu

Making optimal decisions:

- Pack of cards: 7 diamonds (red), 5 hearts (red), 5 spades (black), 2 clubs (black).
- Decision = bet (four choices).
- If you win you get 100$, if you loose you must give 50$.
- What is the loss and optimal decision?
- Suppose we know the card is black. What is the optimal decision now?
- What are the input variables?

More complex example:

- Pack of cards: 7 diamonds (red), 5 hearts (red), 5 spades (black), 2 clubs (black).
- Bet the color (one of four):
  - if the true color is red and you are correct you win 50, otherwise you loose 100,
  - if the true color is black and you are correct you win 200, otherwise you loose 100.
- What is the loss and optimal decision now?

2 Miara jakości w problemie konkursowym

Jaka jest optymalna decyzja w problemie konkursowym?

$$L = \frac{w_v L_v + w_r L_r + w_s L_s}{w_v + w_r + w_s} \tag{1}$$

Tablica 1: Probability of sold.

class	0 (sold)	1 (not sold)
probability		

Tablica 2: Probability of classes of number of replies.

class	1 (0)	2 (1)	3 (2-3)	4 (4-6)	5 (7+)
probability					

Tablica 3: Probability of classes of number of views.

class	1 (0)	2 (1-3)	3 (4-10)	4 (11-35)	5 (36+)
probability					

Tablica 4: Costs – views

		predicted				
		1	2	3	4	5
ground truth	1	0	1	1	1	1
	2	1	0	1	1	1
	3	1	1	0	1	1
	4	1	1	1	0	1
	5	1	1	1	1	0

Tablica 5: Costs – replies

		predicted				
		1	2	3	4	5
ground truth	1	0	1	1	1	1
	2	1	0	1	1	1
	3	1	1	0	1	1
	4	1	1	1	0	1
	5	1	1	1	1	0

Tablica 6: Costs – sold

		predicted	
		0	1
ground truth	0	0	1
	1	1	0

3 Macierz kosztów a zrównoważenie problemu

Jak dobrać macierz kosztów tak, aby przy danym rozkładzie prawdopodobieństwa, straty wszytskich klas były równe?

Tablica 7: Costs – binary

		predicted	
		0	1
ground truth	0 (95%)	0	?
	1 (5%)	?	0

A w bardziej złożonym problemie?

Tablica 8: Cost – multi-class

			predicted		
			a	b	c
ground truth	p_a	a	0	?	?
	p_b	b	?	0	?
	p_c	c	?	?	0