Podsetnik za drugi kolokvijum – Teorija odlučivanja 2017/2018

Odlučivanje pri riziku

$$r_i = \sqrt{\sum_{k=1}^{n} \frac{\delta_k^2 w_k^2}{max_k^2}}$$

$$\delta_i = \sqrt{\sum_{s=1}^{m} w_s * (X_{is} - \bar{X}_i)^2}$$

Način računanja	Sigurnost
OK – rizik	84%
OK – 1,3 * rizik	90%
OK – 1,7 * rizik	95%
OK – 2,4 * rizik	99%
OK	50%
OK + 0,5*rizik	30%

Strukturiranje problema odlučivanja

$$cov(x,y) = \frac{1}{N}\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})$$

$$cor(x,y) = \frac{cov(x,y)}{stdev(x) * stdev(y)}$$

$$\hat{y} = a + b(x) * x$$

$$b(x) = \frac{cov(x,y)}{var(x)}$$

$$a = avg(y - b(x) * x)$$

$$cov(x,y) = \frac{1}{N}\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})$$

$$SSE = (y - \hat{y})^2$$

$$RMSE = \sqrt{\frac{SSE}{n}}$$

$$R^2 = 1 - \frac{SEE}{n * var(y)}$$

Algoritam k najbližih suseda

$$U(S_0, S_m) = \sqrt{\sum_{k=1}^{n}(S_{o,i} - S_{m,i})^2 * w_i}$$

$$Overlap = \begin{Bmatrix} 0: X = Y \\ 1: X \neq Y \end{Bmatrix}$$

$$Goodall3 = \begin{Bmatrix} p(X)^2 : X = Y \\ 1 : X \neq Y \end{Bmatrix}$$

$$p(x) = \begin{Bmatrix} 0, x \leq m \\ \frac{x-m}{n-m}, m < x \leq n \\ 1, x > n \end{Bmatrix}$$

Modelovanje pref.

$$Disk.razlika = \sum_{i=1}^{c} w_i d_{x_i}(r, \hat{r})$$

$$w_i = \frac{1}{\log(r(x_i) + 1)}$$

Ažuriranje težina

$X \succ Y \Rightarrow$

$(max)\ w_i := w_i * a^{Y_i - X_i}$

$(min)\ w_i := w_i * a^{X_i - Y_i}$

$$w_i = \frac{w_i}{\sum_i w_i}$$

ID3

$$H(S) = -\sum_{i=1}^{n} p_i \log_2(p_i)$$

$$p_i = \frac{|C_i|}{|S|}$$

$$\log_2 X = \frac{\log_{10} X}{\log_{10} 2} = \frac{\log_{10} X}{0.301}$$

$$H(X,S) = \sum_{i=1}^{n}\left(\frac{|S_i|}{|S|}H(S_i)\right)$$

$$I(X,S) = H(S) - H(X,S)$$

Evaluacija

$$Accuracy = \frac{TP + TN}{TP + FP + Tn + FN}$$

$$Recall = \frac{TP}{TP + FN}$$

$$Precision = \frac{TP}{TP + FP}$$

Analiza odlučivanja

$$MAXIMIN = \max_{a_i} \min_{s_j} \{p_{ij}\}$$

$$MAXIMAX = \max_{a_i} \max_{s_j} \{p_{ij}\}$$

$$KMV = \max_{a_i} \{p_{ij} *\}, s_j^* = \max\{p(s)\}$$

$$Laplas = \sum_{j=1}^{m} p_{ij} * V(s_j)\ ; V(s_j) = \frac{1}{m}$$

$$ONV(a_i) = \sum_{j=1}^{m} p_{ij} * V(s_j)$$

$$OŽ(a_i) = \sum_{j=1}^{m} ž_{ij} * V(s_j)$$

$$OVPI = \text{perf. slučaj} - OŽ$$

$$AO\ sa\ uzorkovanjem = \frac{v(s_j)v(X|s_j)}{\sum_{i=1}^{n} v(s_i)v(X|s_i)}$$

$$OR = \sum OŽ(a_j|X)v(X)$$

$$OVIU = OVPI - OR$$

$$OČDU = OVIU - troškovi$$

Ka sistemu za podršku odlučivanju

Frekvencija pojavljivanja → sortirati

$$\rightarrow interval = \frac{br.sluč}{n}$$

$$Jednaki\ intervali \rightarrow interval = \frac{max - min}{n}$$

Aritmetička sredina → $\mu \pm n*\rho$

Entropija → sortirati

→ na svakoj promeni vred. ciljnog atributa izračunati $I(X,S)$