

# chapter 3 - slide 26

## *Macro average Precision*

$$\begin{aligned}\pi_1 &= \frac{74}{74+7} = \frac{74}{81} & \pi_4 &= \frac{79}{79+58} = \frac{79}{137} & \pi_7 &= \frac{63}{63+11} = \frac{63}{74} \\ \pi_2 &= \frac{75}{75+17} = \frac{75}{92} & \pi_5 &= \frac{62}{62+7} = \frac{62}{69} & \pi_8 &= \frac{86}{86+50} = \frac{86}{136} \\ \pi_3 &= \frac{69}{69+12} = \frac{69}{81} & \pi_6 &= \frac{67}{67+47} = \frac{67}{114} & \pi_9 &= \frac{68}{68+45} = \frac{68}{113}\end{aligned}$$

$$\pi^M = \frac{\sum_{i=1}^{|c|} \pi_i}{|c|} = \frac{\frac{74}{81} + \frac{75}{92} + \dots + \frac{68}{113}}{9} = 0,74767\%$$

## *Macro average Recall*

$$\begin{aligned}\rho_1 &= \frac{74}{74+26} = \frac{74}{100} & \rho_4 &= \frac{79}{79+20} = \frac{79}{99} & \rho_7 &= \frac{63}{63+38} = \frac{63}{101} \\ \rho_2 &= \frac{75}{75+24} = \frac{75}{99} & \rho_5 &= \frac{62}{62+37} = \frac{62}{99} & \rho_8 &= \frac{86}{86+14} = \frac{86}{100} \\ \rho_3 &= \frac{69}{69+32} = \frac{69}{101} & \rho_6 &= \frac{67}{67+31} = \frac{67}{98} & \rho_9 &= \frac{68}{68+32} = \frac{68}{100}\end{aligned}$$

$$\rho^M = \frac{\sum_{i=1}^{|c|} \rho_i}{|c|} = \frac{\frac{74}{100} + \frac{75}{99} + \dots + \frac{68}{100}}{9} = 0,7169\%$$

## *Micro average Precision*

$$\pi^\mu = \frac{74 + 75 + 69 + 79 + 62 + 67 + 63 + 86 + 68}{81 + 92 + 81 + 137 + 69 + 114 + 74 + 136 + 113} = \frac{643}{897} = 0,7168\%$$

## *Micro average Recall*

$$\rho^\mu = \frac{74 + 75 + 69 + 79 + 62 + 67 + 63 + 86 + 68}{100 + 99 + 101 + 99 + 99 + 98 + 101 + 100 + 100} = \frac{643}{897} = 0,7168\%$$

## *Macro average F1*

$$F_1 = \frac{2 \cdot 0,74767 \cdot 0,7169}{0,74767 + 0,7169} = 0,73196\%$$

## *Micro average F1*

$$F_1 = \frac{2 \cdot 0,7168^2}{2 \cdot 0,7168} = 0,7168\%$$