Data

Science

Information fusion in data analysis

Data Fusion – Project (2)

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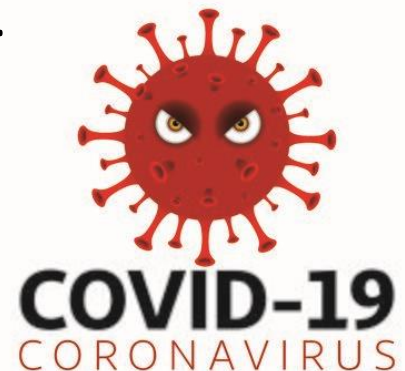alberto@dei.uc.pt, jh@dei.uc.pt

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◢ **Problem – Stratification of COVID patients**

- ■ Individuals with suspected COVID are admitted to the hospital emergency room

- ■ At the time of admission, several variables/parameters are acquired (low cost and simple to acquire)

- ■ Based on these variables, the health professional must decide whether the individual remains hospitalized for additional examinations or should return home.

Stratification of COVID patients

$X1$

$X2$

...

Xn

Bayes Decision Model

T

{0,1}
0 – Returns home
1 – Stays at hospital

◢ Data set

- **X1**　　*Gender*　　　　　{0,1} = { Female, Male}
- **X2**　　*Age*　　　　　　[34 .. 99]
- **X3**　　*Marital status*　　{0,1} = { single, married}
- **X4**　　*Vaccinated*　　　{0,1} = { No, Yes}
- **X5**　　*Breathing difficulty*　{0,1,2,3} = { none, some, moderate, high}
- **X6**　　*Heart Rate*　　　 [38.. 272]
- **X7**　　*Blood pressure*　 [115.. 164]
- **X8**　　*Temperature*　　 [36.00 .. 38.98]
- **X9**　　*Clinical Guidelines*　 A rule based on the breathing difficulty and the temperature

- **T**　　*Decision*　　　　Final decision
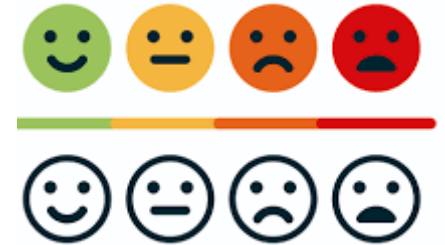
　　　　　　　　　　　{0,1} = { return home, stay at hospital }

◤ Information fusion

- Historical, measurements, clinical knowledge (guidelines)
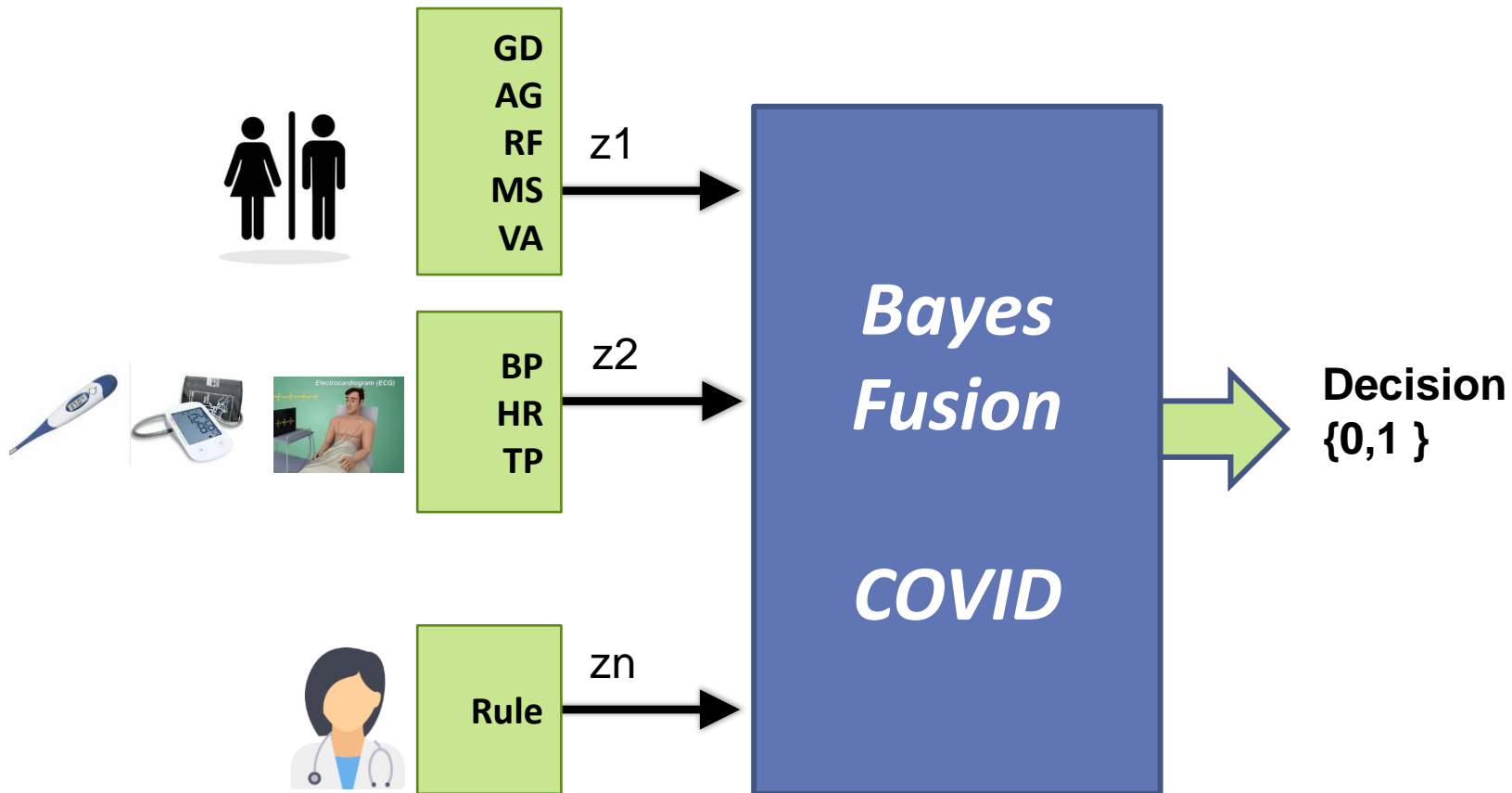
◢ Questions

- Is the performance of the classifier acceptable ?

- Should all information (inputs/variables) be used ?

- Discrete versus continuous variables ?

- Conditional probabilities : normal distribution ?

- ….

◢ Elements for evaluation

- **Code**
  - All code should be provided

- **Report**
  - Maximum 5/6 pages
  - Explain the important decisions

- **Defense**
  - Mandatory

- **Deadline for submission**
  - ??