

# Device based gesture recognition

Damien Zufferey

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# Introduction

- "Human – Machine" interactions
  - Reduce barrier between them
  - More natural communication
  
- Solution ?
  - => Gesture recognition



# Gesture definition

- Difficult exercise to give a general definition
- With a focus on device based gesture recognition, we have :
  - Static gesture (posture)
  - Dynamic gesture (gesture)

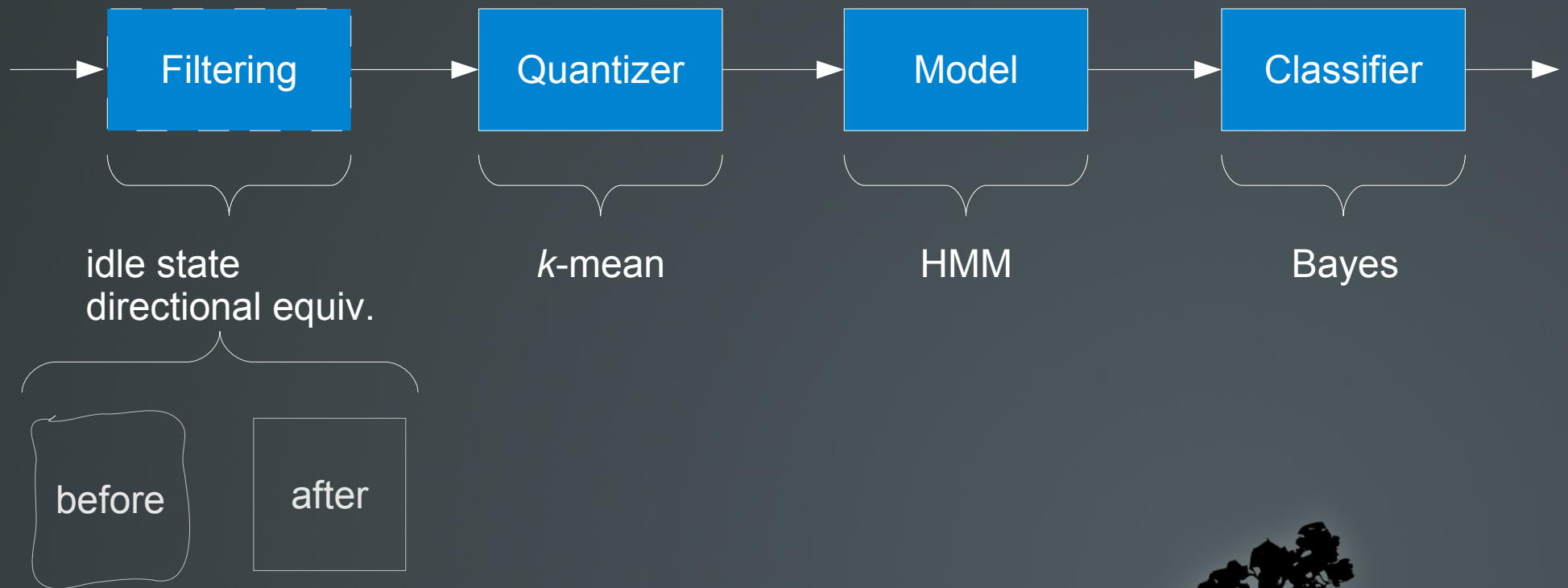


# Accelerometer based gesture recognition

- Device equipped with 3-axis accelerometer
  - Wii Controller (Wiimote)
  - SoapBox
- Accelerometer provides
  - Data vectors for acceleration in space (x,y,z)
- Sample of gestures to be recognized :



# Process



# Application – Evaluation

- Wiimote : recognition rate of 90 %
  - A set of 5 clearly different gestures
  - 15 training for each gesture
- SoapBox : recognition rate of 95 %
  - A set of 8 clearly different gestures
  - 6 training for each gesture

=> Application:

a controller for TV or VCR



# Glove based gesture recognition

- A data glove is a glove-like input device
  - detection of bending of fingers (basic feature)
  - detection of movements of the wrist (possible feature)
  - An optical or magnetic tracking system to detect glove position/motion in 6 DOF (possible feature)





# Process

- Filtering
  - due to lighting conditions, position informations can be very noisy
- Postures
  - are taught to the system by simply performing them
  - should be held between 300-600 milliseconds to be recognized by the system
- Gestures
  - simply a sequence of postures



# Application – Evaluation

- Evaluation through a demo application
  - virtual 3D desktop controlled with gestures
- Some difficulties
  - users are not accustomed to this device
  - sometimes it is necessary to individually adapt the definition of some postures.



# Discussions

- Accelerometer based
  - too many training (laborious for the user)
  - a small set of clearly different gestures
- Glove based
  - equipment too intrusive for the user



# Questions

?

