

Distributed data fusion applied to human gesture measurement

## Distributed data fusion applied to human gesture measurement

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# Distributed data fusion applied to human gesture measurement

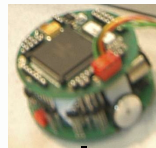
## Goal

dataglove



mC

robot



mC

Fusion

mC

video camera



PC

Intelligent  
Instruments

Network

## Goals

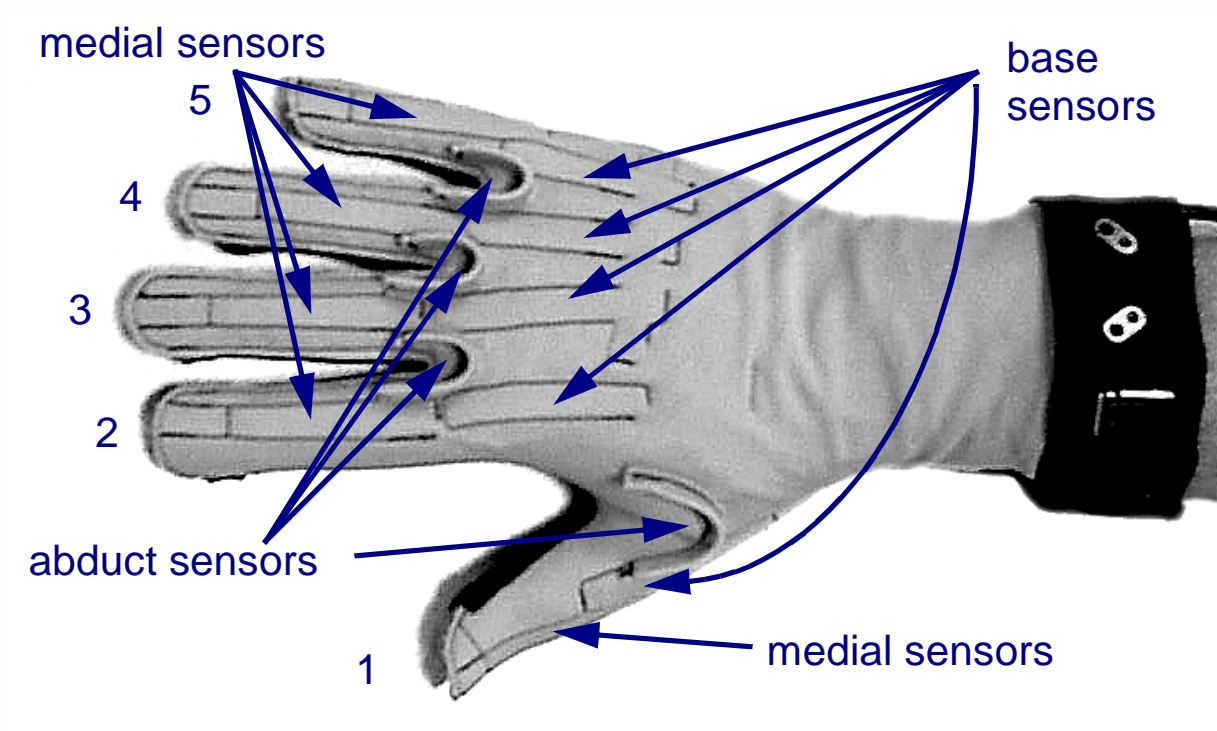
To drive a mobile robot with hand gestures

- To acquire **static** hand postures
- To acquire arm gestures (**dynamic**)
- To fuse data from these both sources

# Distributed data fusion applied to human gesture measurement

## Acquisition stage

A dataglove to acquire hand postures



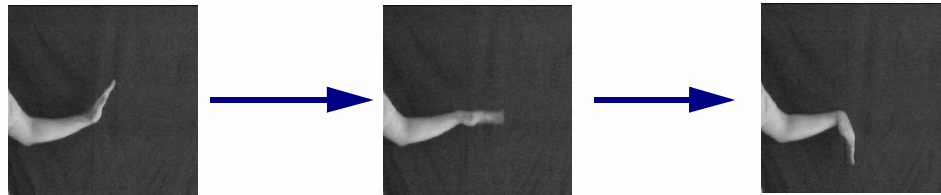
data: 18 sensors (15 values used)

angles translated into bytes -> vector of 15 bytes

# Distributed data fusion applied to human gesture measurement

## Acquisition stage

A video camera to acquire arm gestures



data: 10 RGB planes/s

Need to be interpreted before being fused

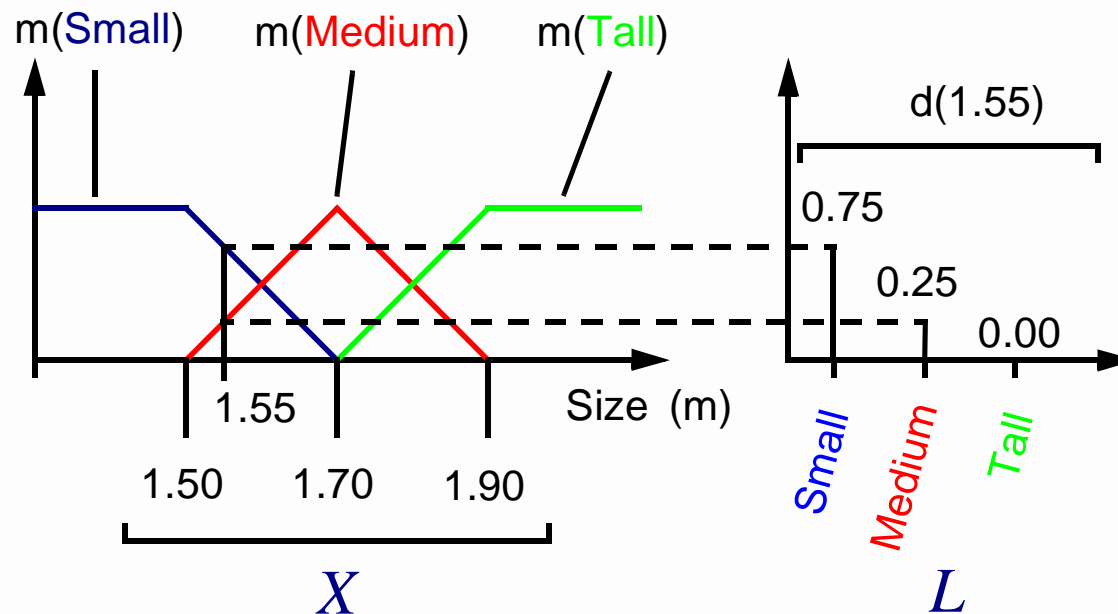
# Distributed data fusion applied to human gesture measurement

## Fuzzy description of measurement

Common representation for both sources



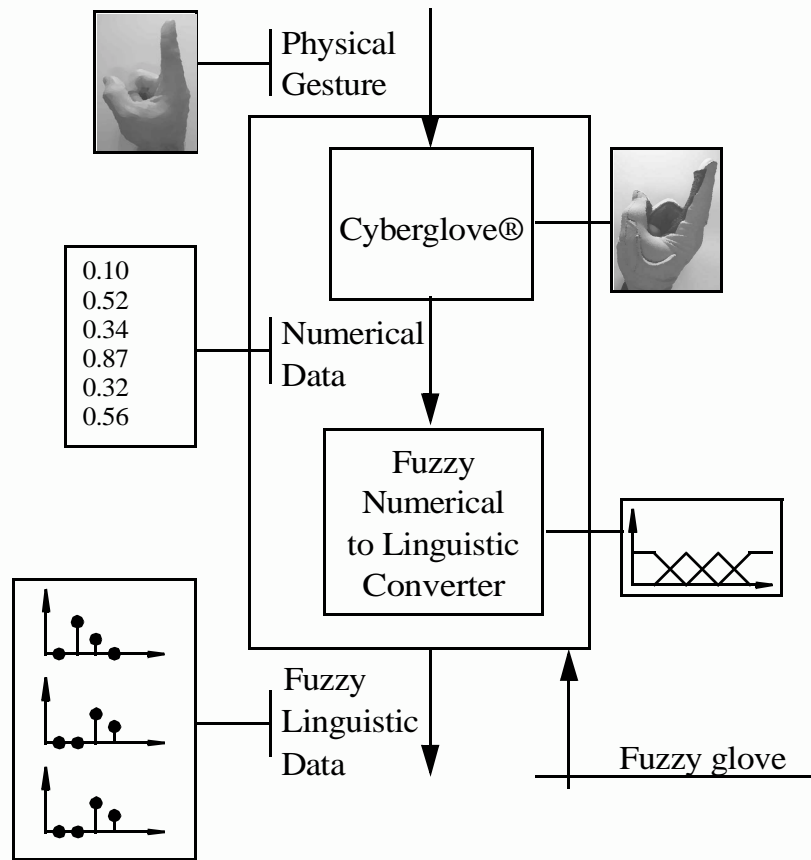
Fuzzy description / fuzzy meaning



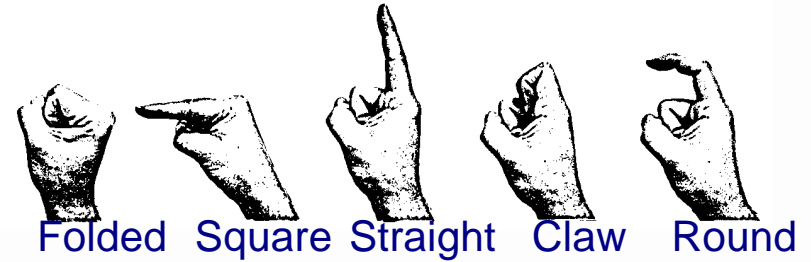
# Distributed data fusion applied to human gesture measurement

## Fuzzy description of hand posture

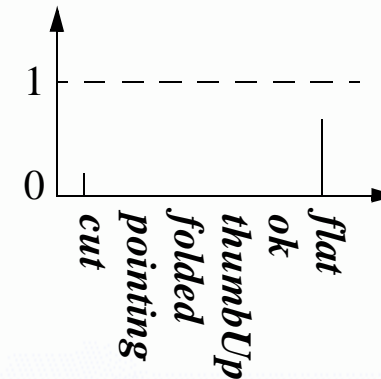
### General process



### Rule based aggregation

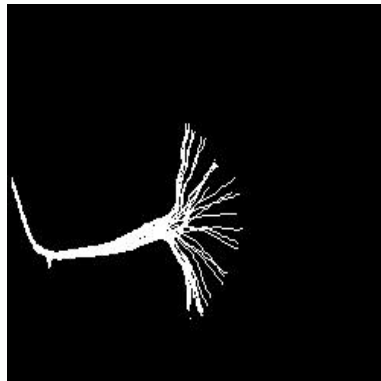
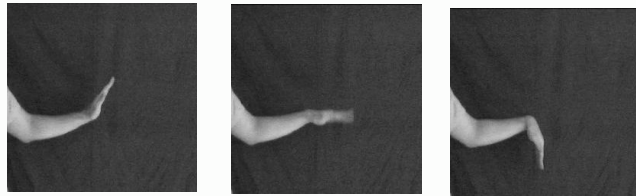


		Base sensor of index	
		Straight	Folded
Medial Sensor of index	Folded	Claw	Folded
	Half	Round	Round
	Straight	Straight	Square



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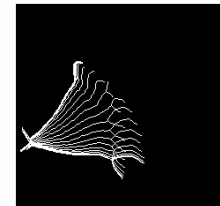
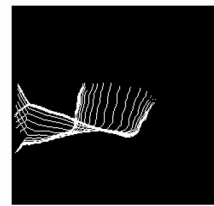
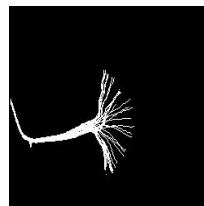
## Fuzzy description of arm gesture



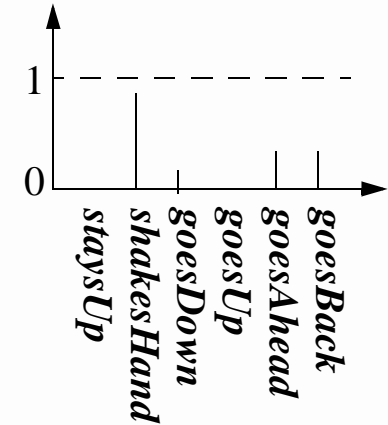
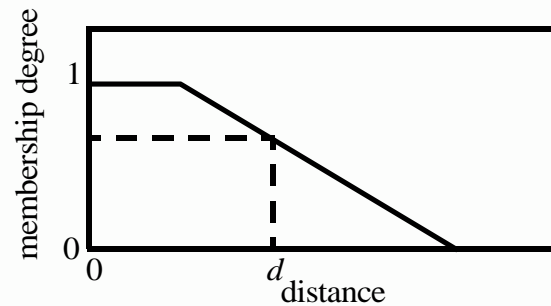
dynamic signature



Baddeley distance



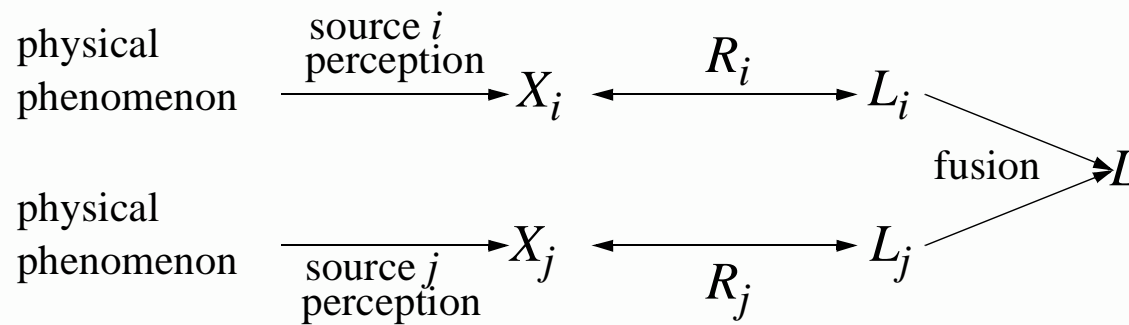
prototypes



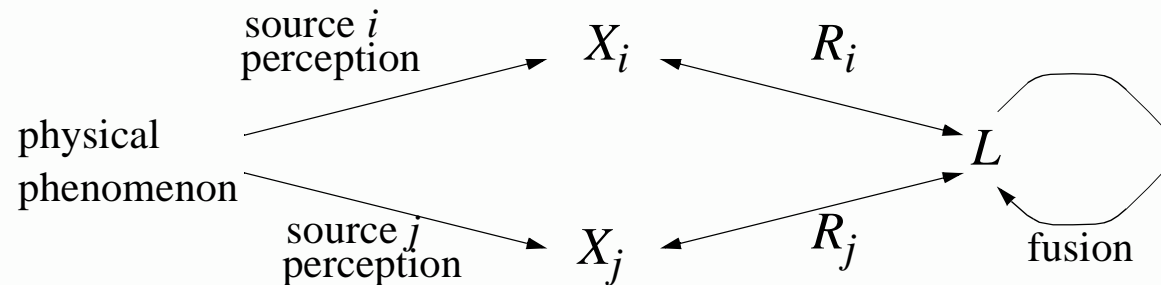
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## Fusion process

complementary sources: physical phenomena considered as different



redundant sources: same physical phenomenon, different point of views

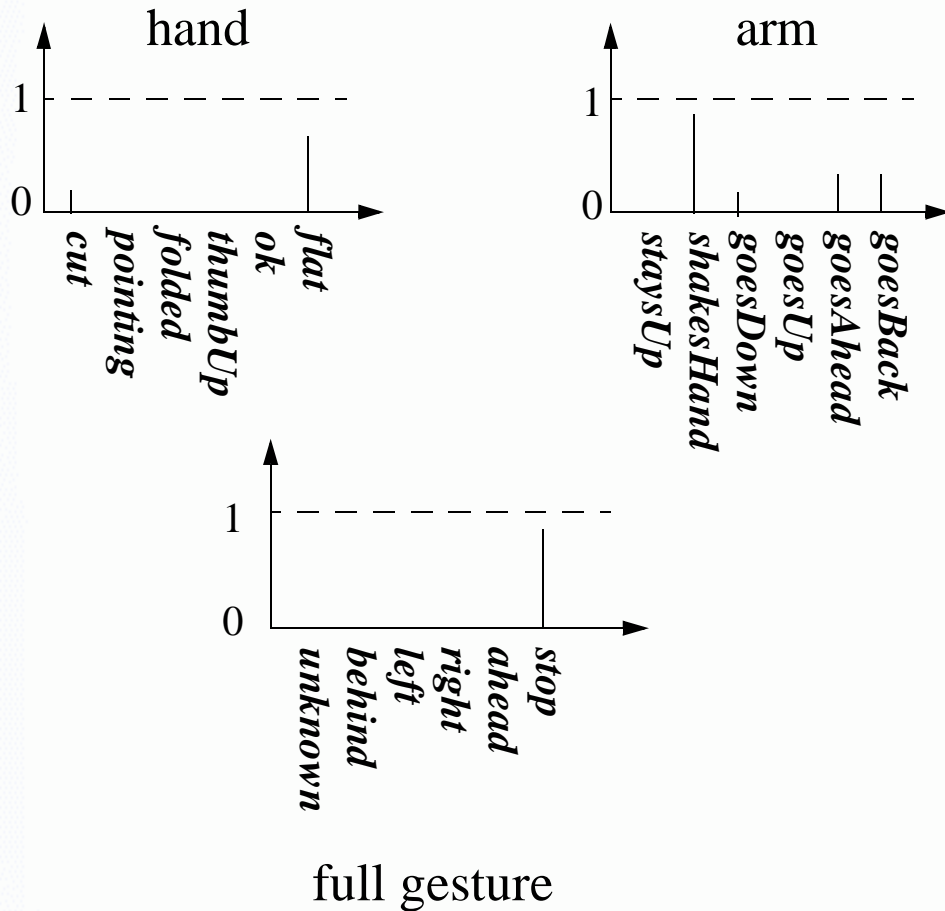




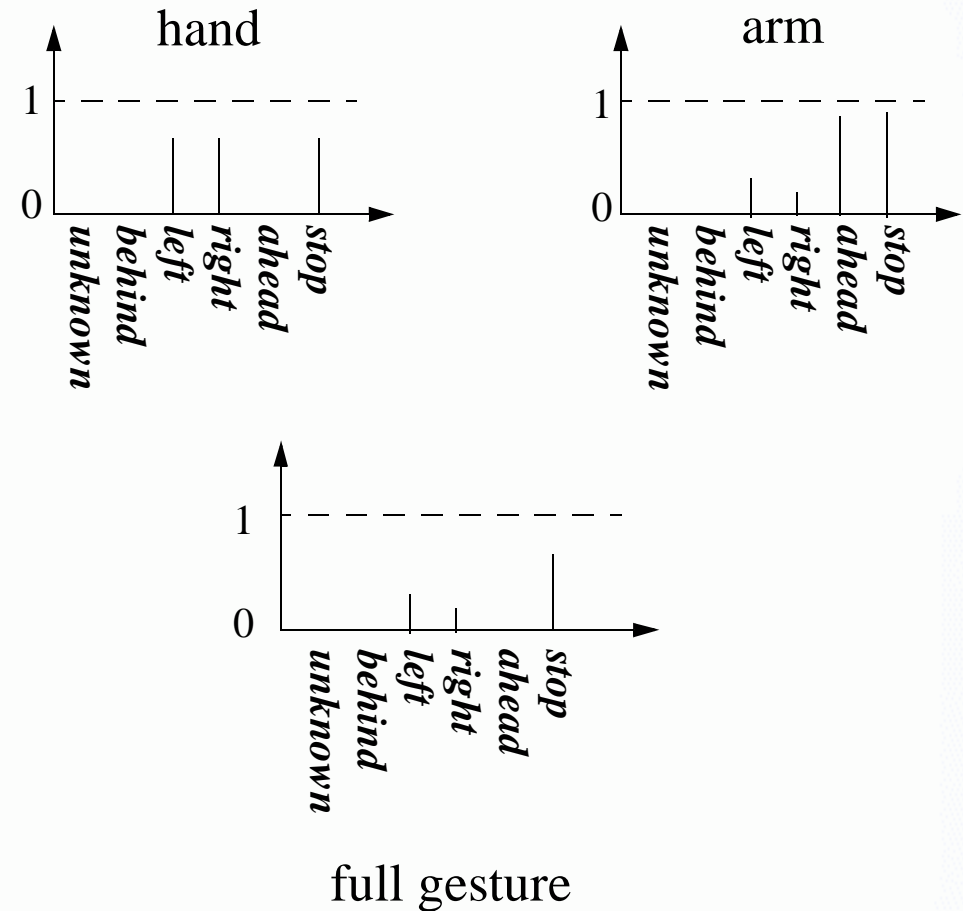
# Distributed data fusion applied to human gesture measurement

## Results

### Complementary sources



### Redundant sources



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## Conclusion

- Fuzzy subsets: common representation for etherogeneous data
- Possibility to combine redundancy and complementarity

## Future

- Integration of design data in the fusion process
- Improvement of learning procedure
- Application to other Man Machine Interfaces