

# Smart Surveillance Sensors

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# Smart Cities / Smart World

## Automotive+Logistics:

parking, traffic, noise,  
smart roads (signalling)

## Environment+Supply:

waste, noise, lighting,  
fresh+waste water,  
electricity supply,  
electromagn. field level

## Structural Health:

bridges, monuments,  
buildings

## General Purpose:

car, people, mobile,  
WiFi or Bluetooth

## Desaster:

flooding, forest fire,  
landslide

# Smart Wearable Devices: Service+Engineering / Healthcare / Sports

## Smart Wearable Healthcare

monitoring of wellbeing

- fall detection
- cardiac, circulation, breathing

## Locating people and objects

## Smart Wearable Engineering

worker safety and guidance

e.g. monitoring part dis-/assembly and repair

## Smart Wearable Sports

- track position (sports games)
- record performance
- **coaching and advice**
- avoid accidents

## Criteria

- usefulness
- ease of use
- **intrusiveness**
- comfort

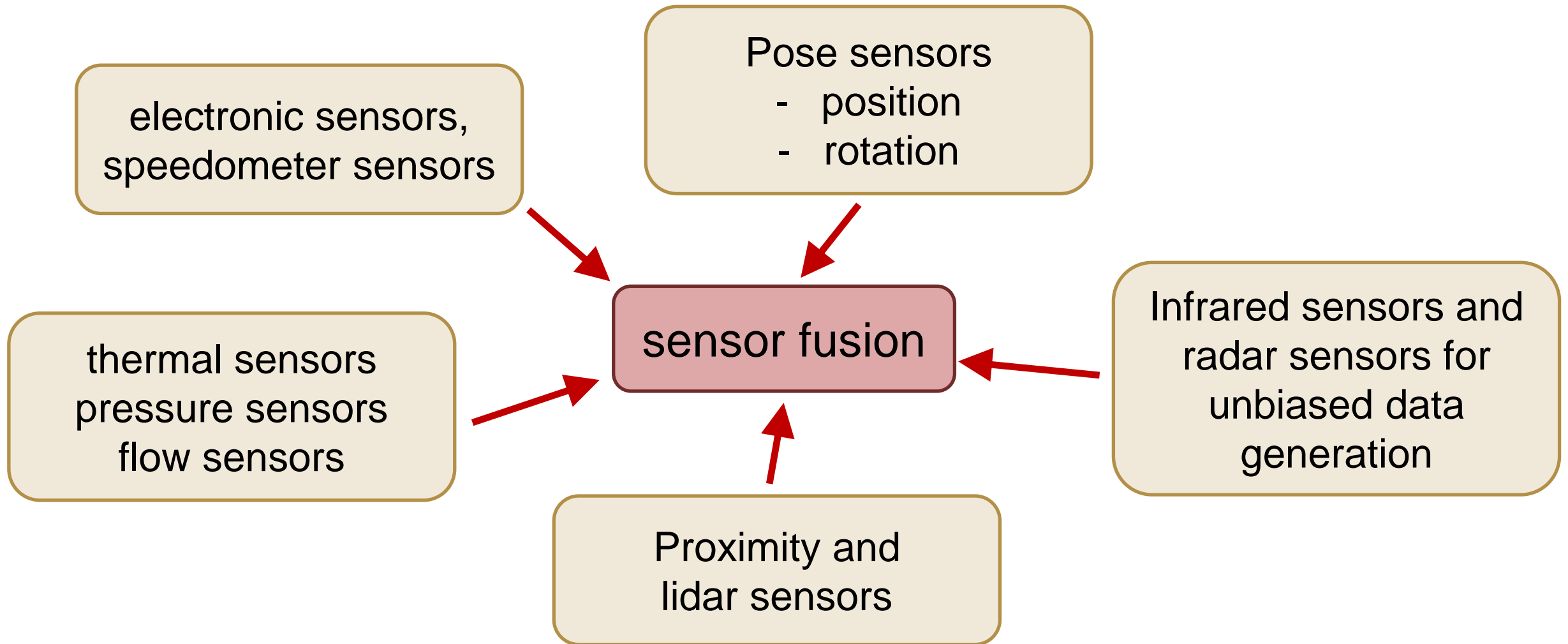


10 Most Innovative Wearables for Fitness and Sport (apacbusinessheadlines.com)



*Head-up display with audio-visual prompts*

## Smart Surveillance Sensor Types (Selection)

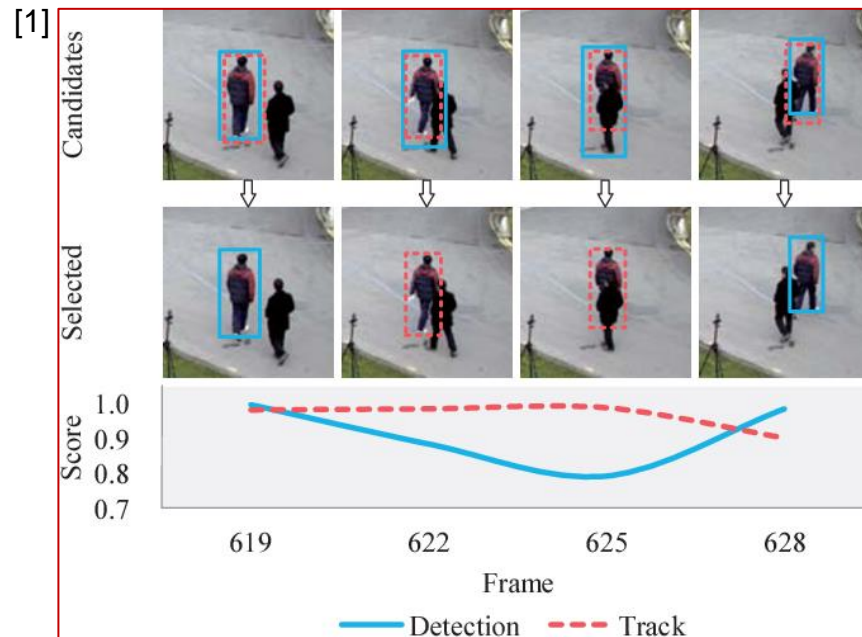


# Vision-Based Smart Surveillance Sensors

## Tasks

- detect ...
- identify ...
- track ...

... people and objects.



## Applications

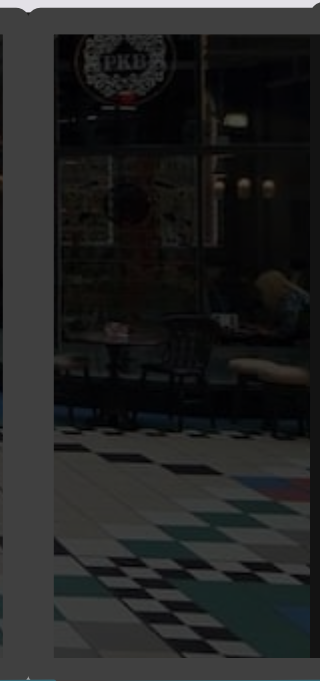
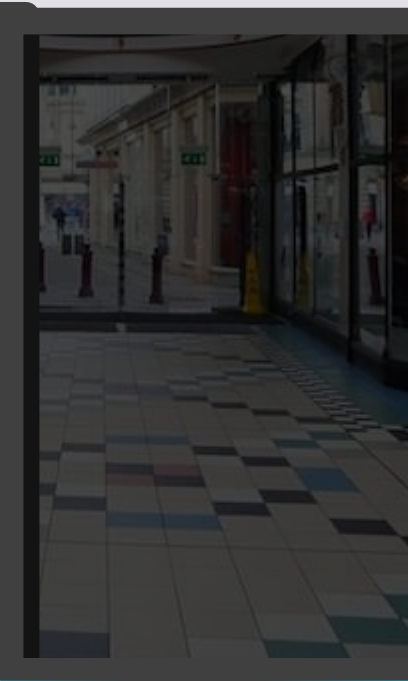
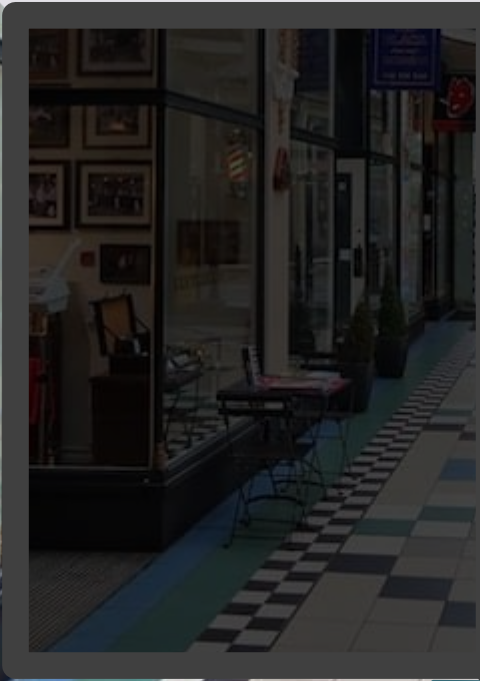
broad fields ranging from mobile devices to smart homes to smart cities

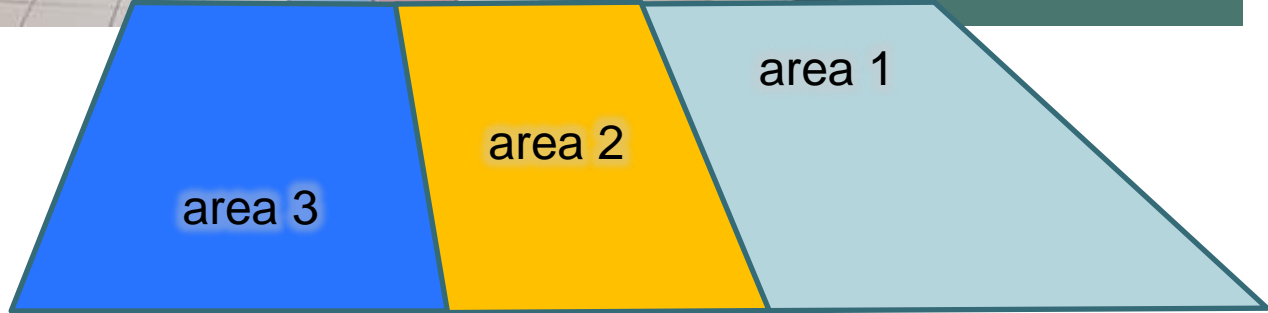
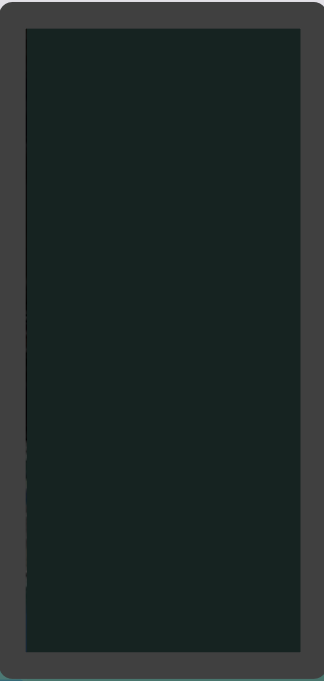
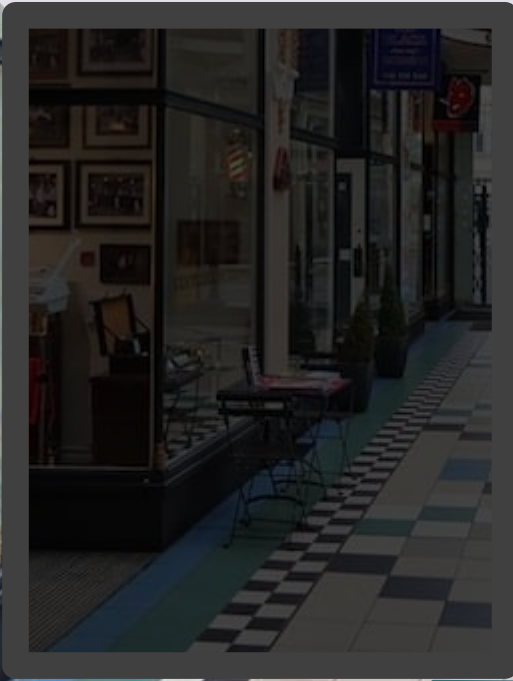
Challenges encountered in the application of vision-based smart surveillance sensors

- availability (e.g. WIFI connection, cloud services)
- robustness (e.g. extraneous light, weather)
- reproducibility (e.g. A.I. based data evaluation)

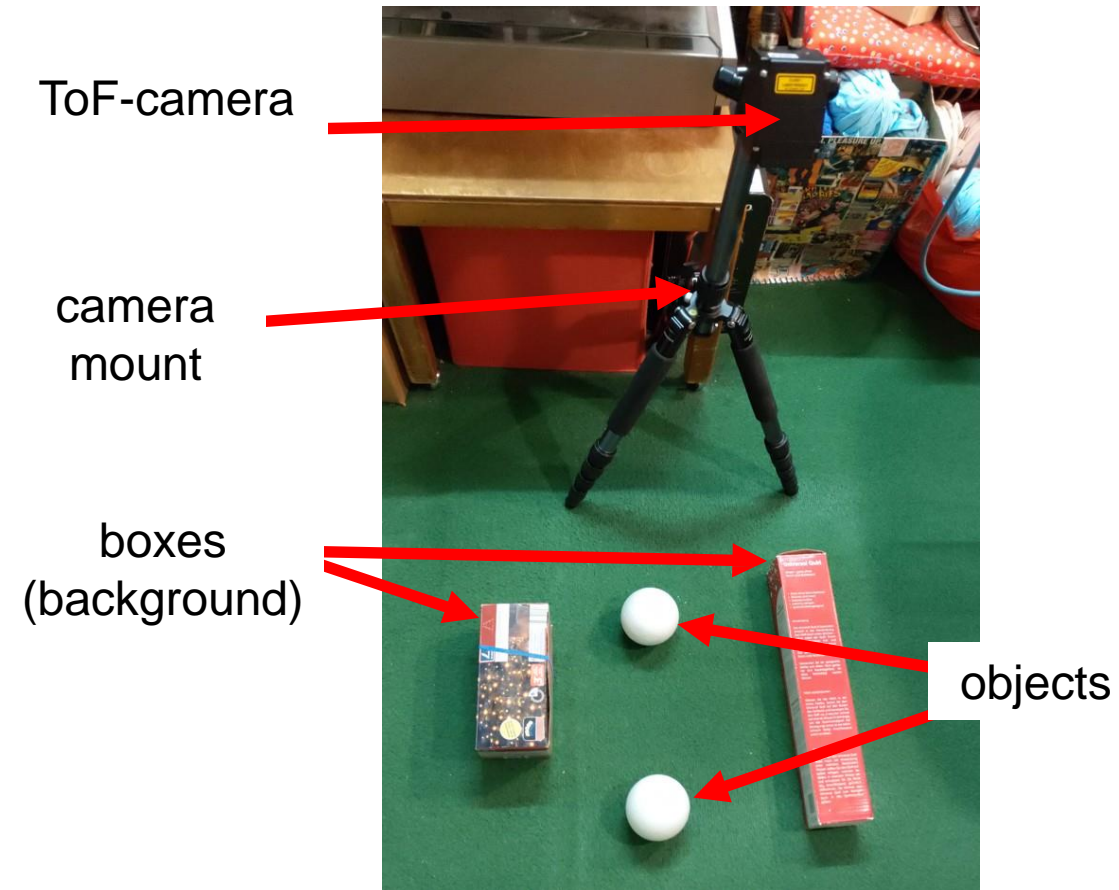
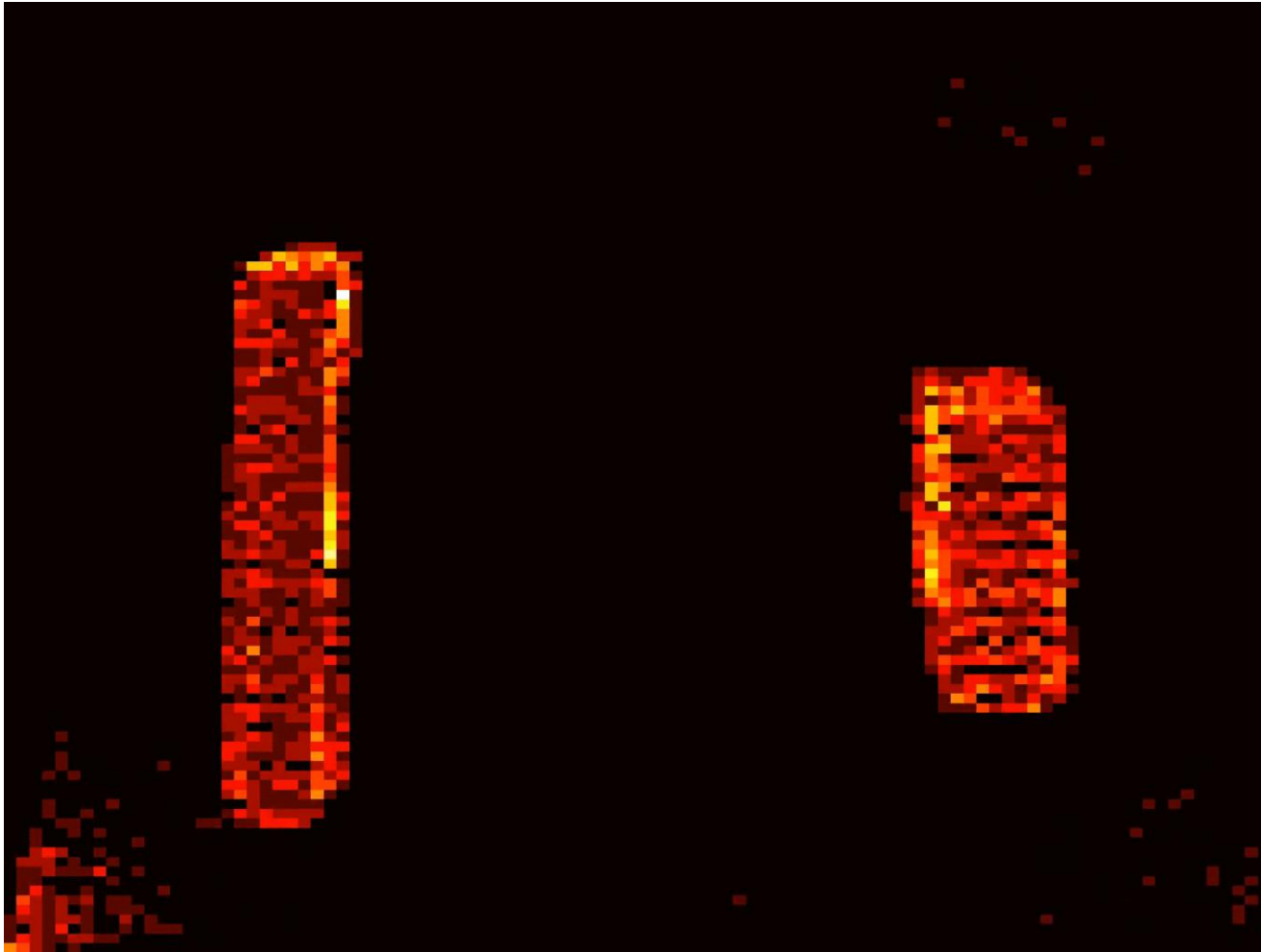
- human machine interaction







# Object Tracking using 3D Vision





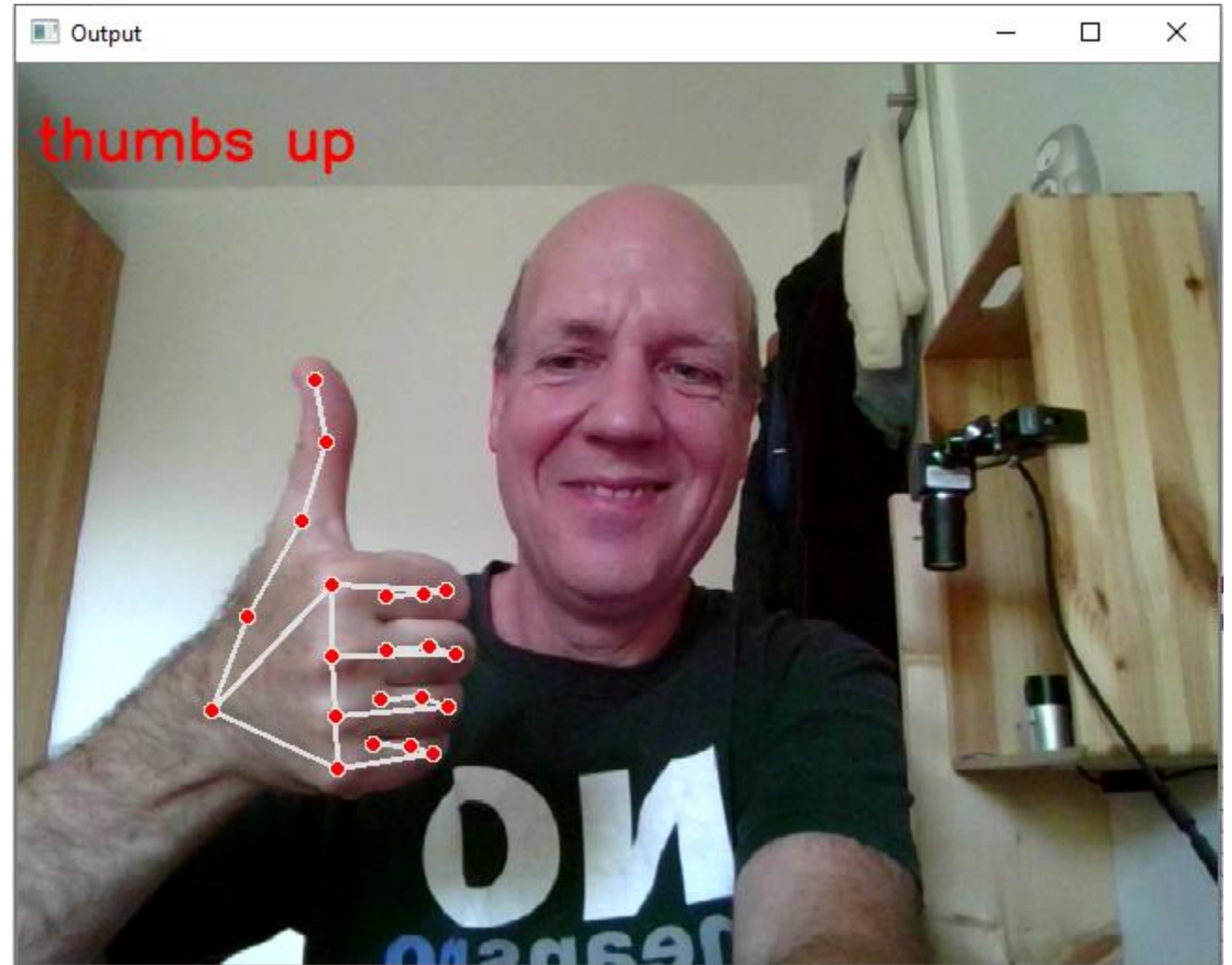
# Human Machine Interaction

## Audio-based:

Speech Control / NLP  
Natural Language Understanding,  
Processing, Generation

## Vision-based:

Gesture Control  
Mimics Control/Feedback (Emotions)



# Das Photonics-Netzwerk der FH Graubünden...immer noch am wachsen




## Organizational Remarks



## Lab Tours + Lunch

**SWISS PHOTONICS**

### Lab-Tours

- eye and laser safety
- robotics student projects
- photonics student projects

start every 10 mins

meeting point: next to lecture theatre  
(at the bottom of the stairs)

register at the reception

Lunch starts at 12:30

Mensa FH Graubünden

have your vouchers ready

1 veggie meal + 1 softdrink

1 meat meal + 1 softdrink

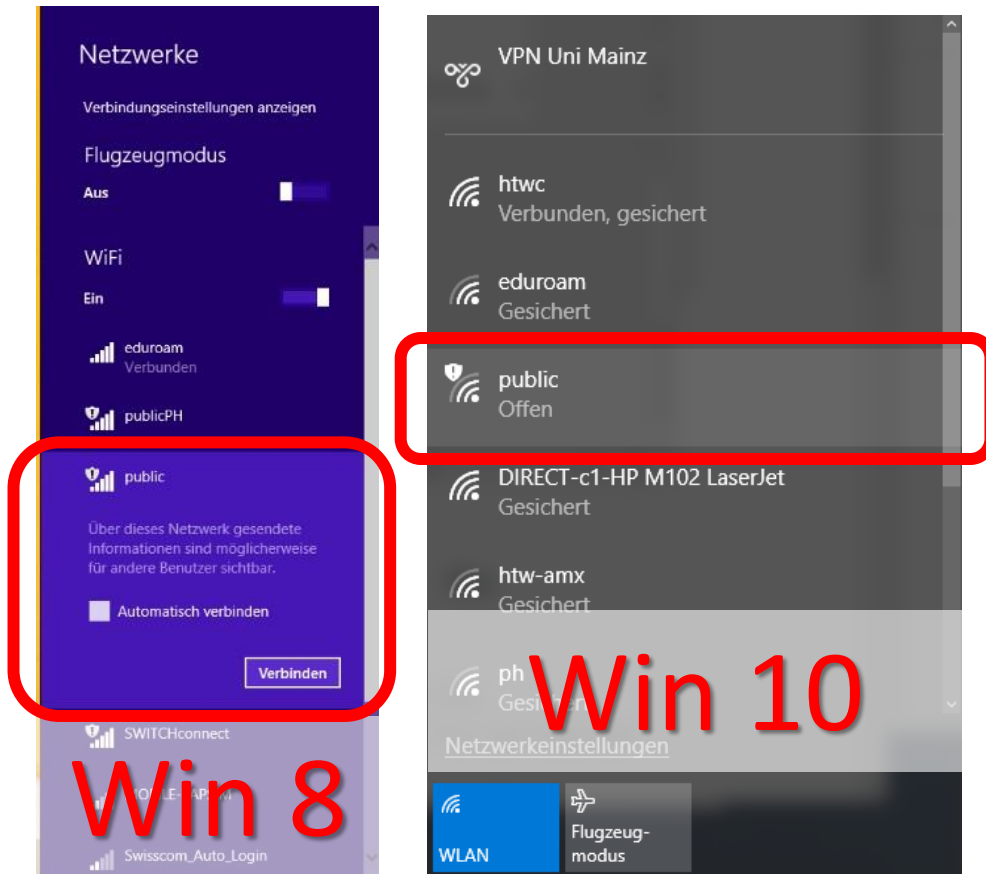
(small salad or soup included)

voucher not valid for large salad or bowl



# WLAN access

## 1. Connect to WLAN «public»



Mac

## 2. Start browsing

## 3. Register with mobile phone

### Anmeldung für das public WirelessLAN

Benutzername

Passwort

Sie haben noch keine Zugangsdaten der HTW Chur?



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**Thank you for your attention.  
Vielen Dank für Ihre Aufmerksamkeit.  
Grazia fitg per l'attenziun.  
Grazie per l'attenzione.**

Fachhochschule Graubünden  
Scola auta spezialisada dal Grischun  
Scuola universitaria professionale dei Grigioni  
University of Applied Sciences of the Grisons

**swissuniversities**



automatic sliding door

