VERHAERT


# Human Motion Capture

## iTRACK Technology

**Dany Robberecht**

VERHAERT

# Agenda

- Introduction Verhaert
- iTRACK technology
- INmotion system
- Collaboration

VERHAERT

## Leading Belgian new products & business development company

- Diversified system business
- System approach towards product development
- Strategic combination of product development and manufacturing services, resulting in complete solutions.
- Adaptable project driven organisation
- Long term strategic partnerships up-and down stream

35 Years Masters in innovation

VERHAERT

# Multi disciplinary resources

– Human Engineering

– Electronic Engineering

– Mechanical Engineering

– Industrial Design

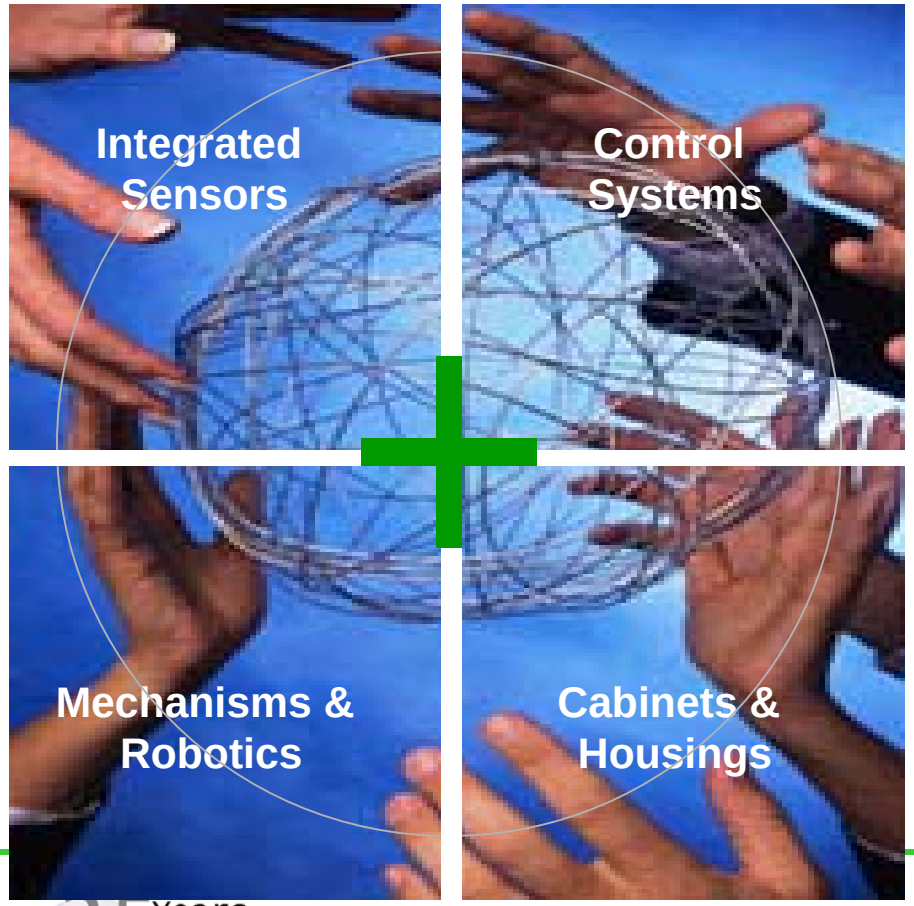
– Software Engineering

– Applied Physics

***All in-house disciplines to define, manage and develop complete systems***

VERHAERT

# Areas of expertise




## Integrated sensors

- selection and fusion of sensor principles; acoustic, optics electrical, chemical, bio sensors, inertial sensors, etc..
- development of algorithmes and processing software

## Control Systems

- thermal, motion, environmental , fluid loops, etc.

## Mechanisms & Robotics

- advanced mechanisms design
- innovative low cost mechanisms

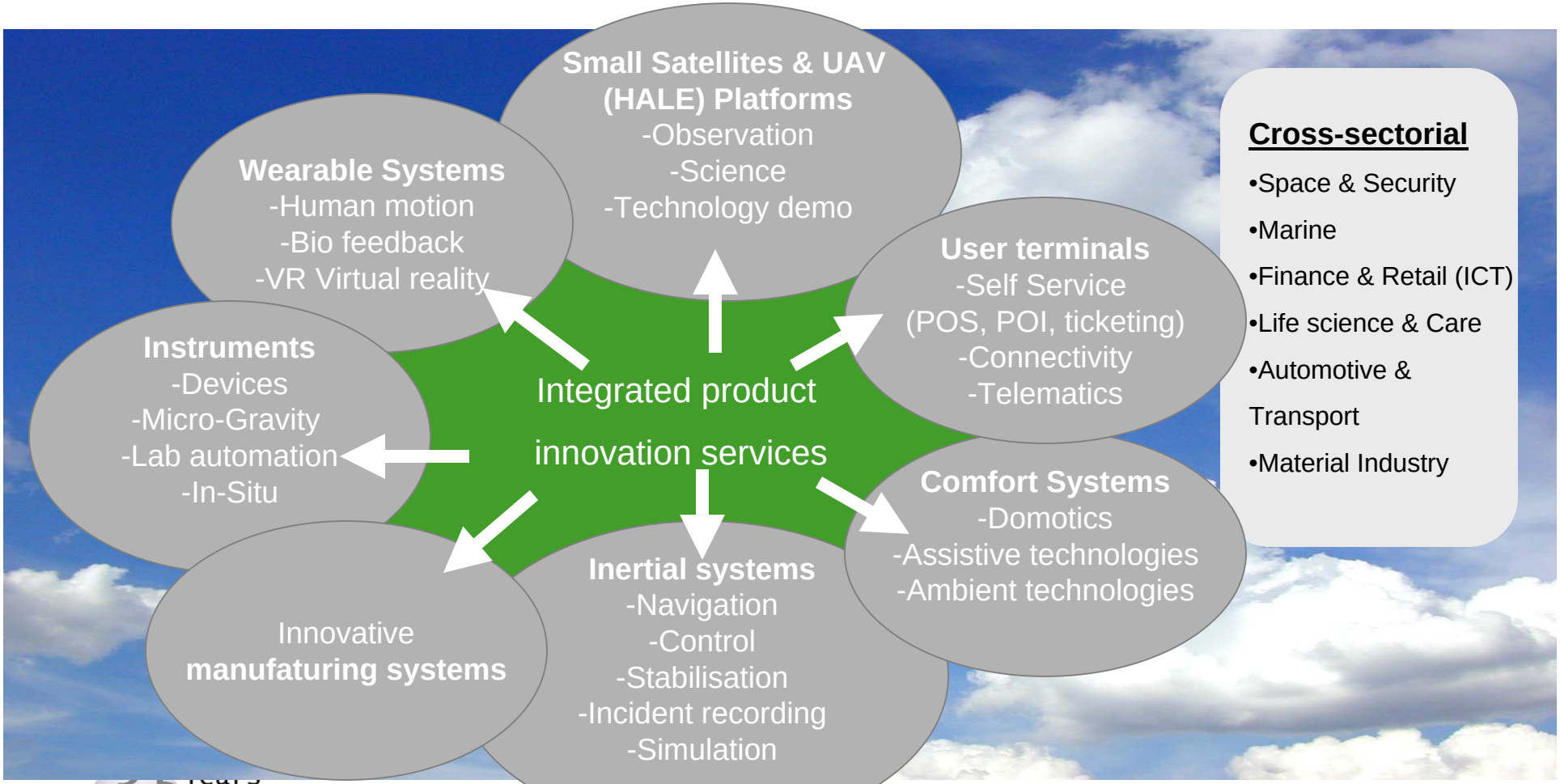
## Cabinets & Housings

- Human interfaces
- Harsh environments
- EMC shielding

35 Years Masters in innovation

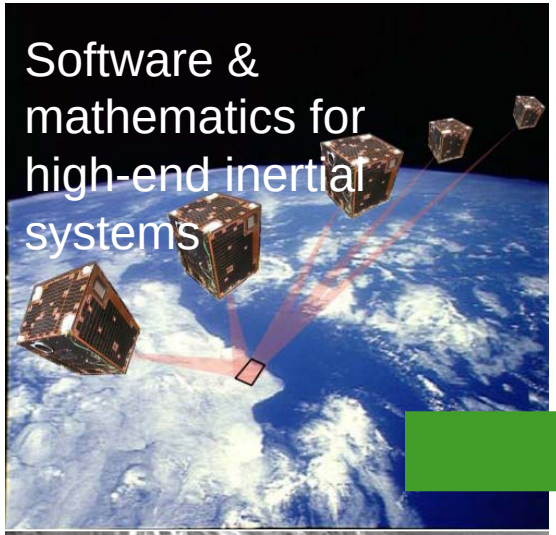
VERHAERT

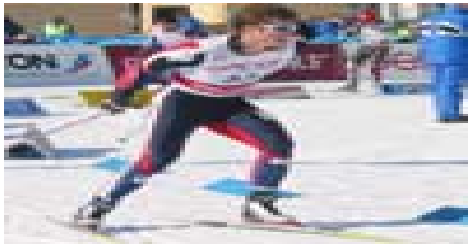
# Field of activities



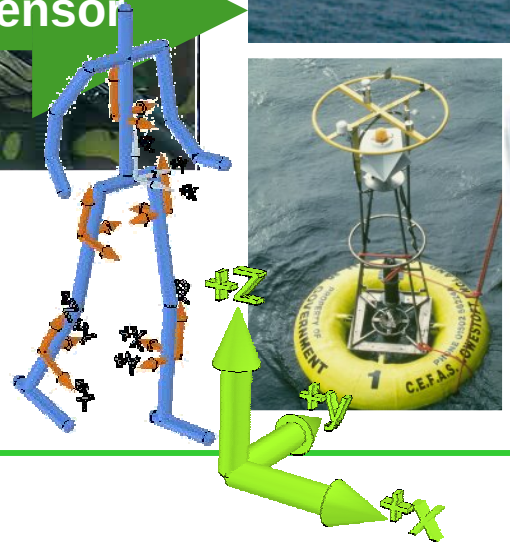
VERHAERT

# History and background of inertial technology



3D Motion sensor






VERHAERT

# Human motion capture powered by iTRACK

VERHAERT

# iTRACK Technology

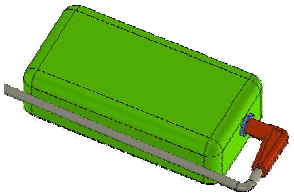
**iTRACK** Human Motion Systems

- **PNM** Navigation
- **ALERT** Ergonomics
- **INmotion** Virtual Reality
- **WTSS** Wearable Training & & Security Systems

## **iTRACK** SENSORS

**iTRACK** S50

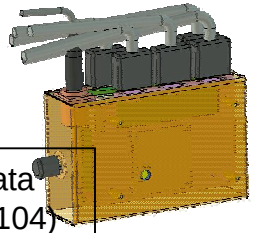
**iTRACK** S100



**iTRACK** M900

## **iTRACK** PHERIPHERALS

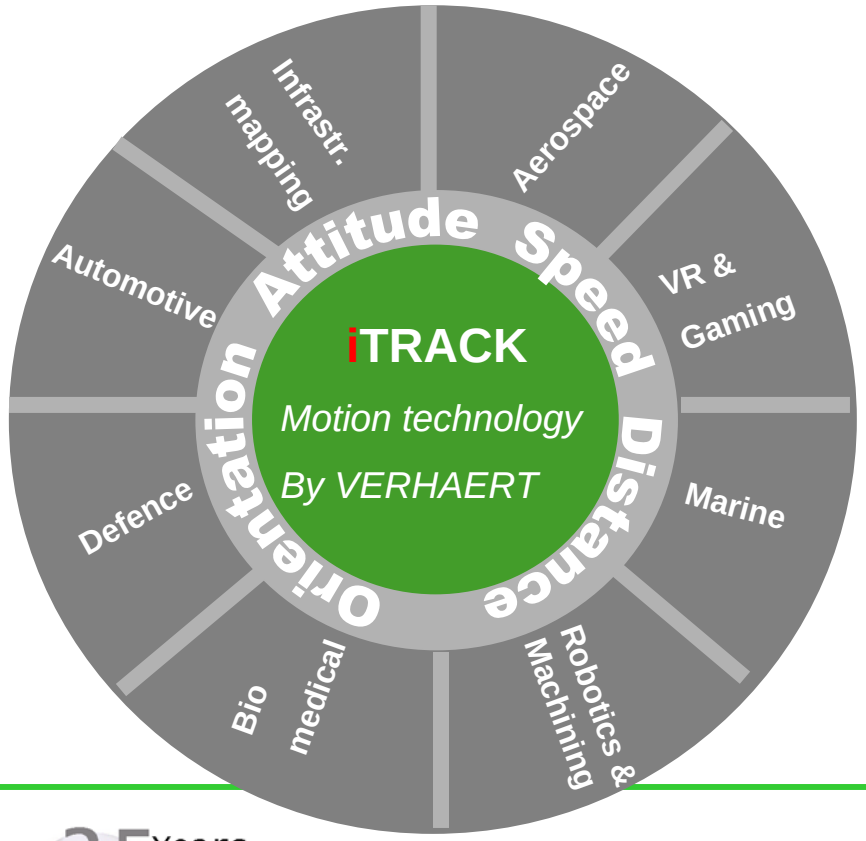
- Wave Mapper
- Temperature compensation system
- Datalogger
- CPU Multi sensor data processing unit (PC104)
- Bluetooth communication module



VERHAERT

# A broad range of applictions

## Multi market solutions




## Key applications

- Navigation
- Control & stabilisation
- Incident recording
- Simulation

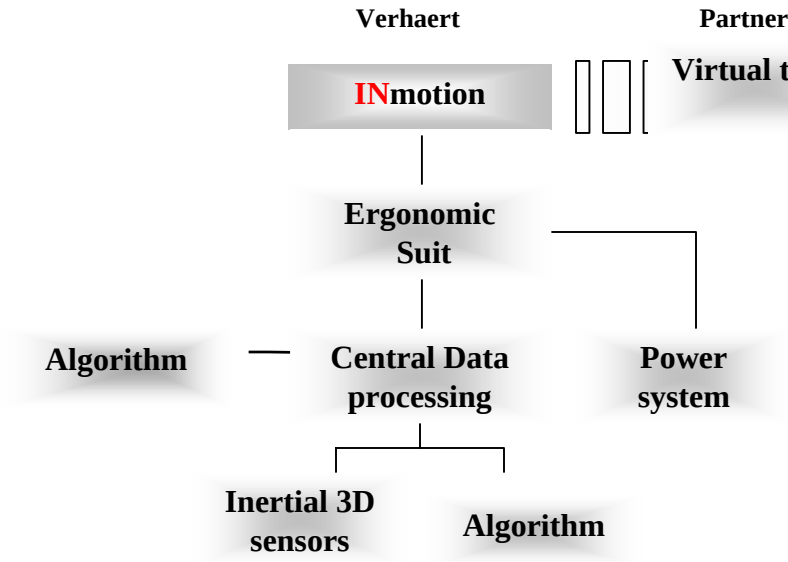
SIMRAD A KONGSBERG Company
TENNECO Automotive
Rolls-Royce
LMS INTERNATIONAL Empowering Engineering Innovation
SAGEM
innovation 4C
RENAULT
FUGRO
AIRBUS

35 Years Masters in innovation

VERHAERT

# What is INmotion?

Advanced R&D program targetting to develop a new human mocap system based on proven technology




- INmotion offers
  - High accuracy (+-1cm/segment)
  - Low cost
  - Superior set-up & calibration
  - Multi-actor capture
  - Outdoor capturing
  - Virtual Real Time follow up

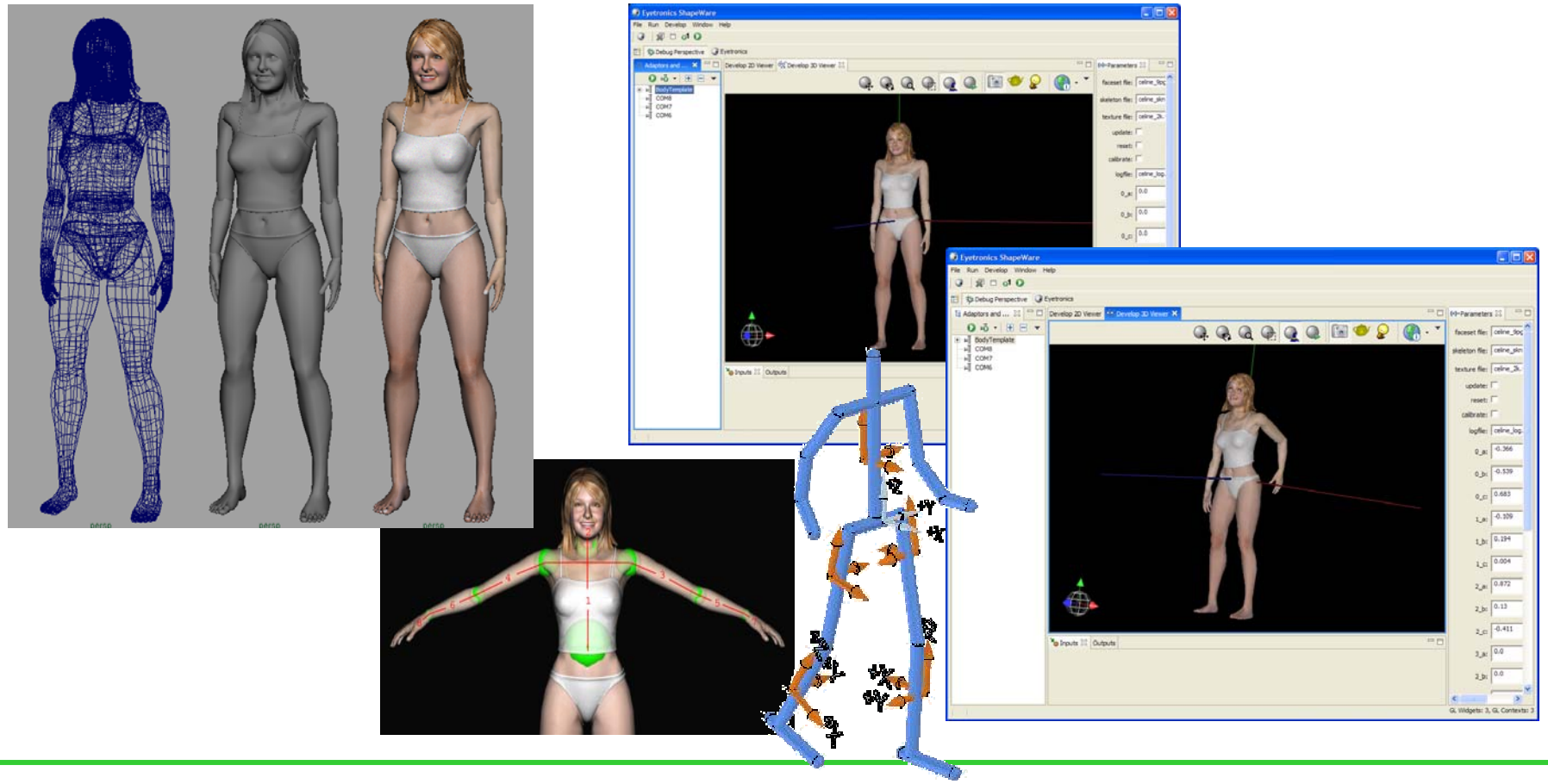
VERHAERT

# Program specifications

- No line-of-sight
- Full 3D
- Indoor / outdoor use (outdoor semi conditioned)
- Number of segments :
  - standard 5 (flexible set-up)
  - Goal 9-12 sensor positions
  - Segments can be changed in the field
- Accuracy target: 1° per segment
- Data-output: real time
  = 4 quaternions per sensor @ 50 Hz
- Autonomy: 2h
- Near RT interface with Kaydara or another animation software package

VERHAERT

# Interface with animation software



VERHAERT

# iTRACK powering the ALERT system

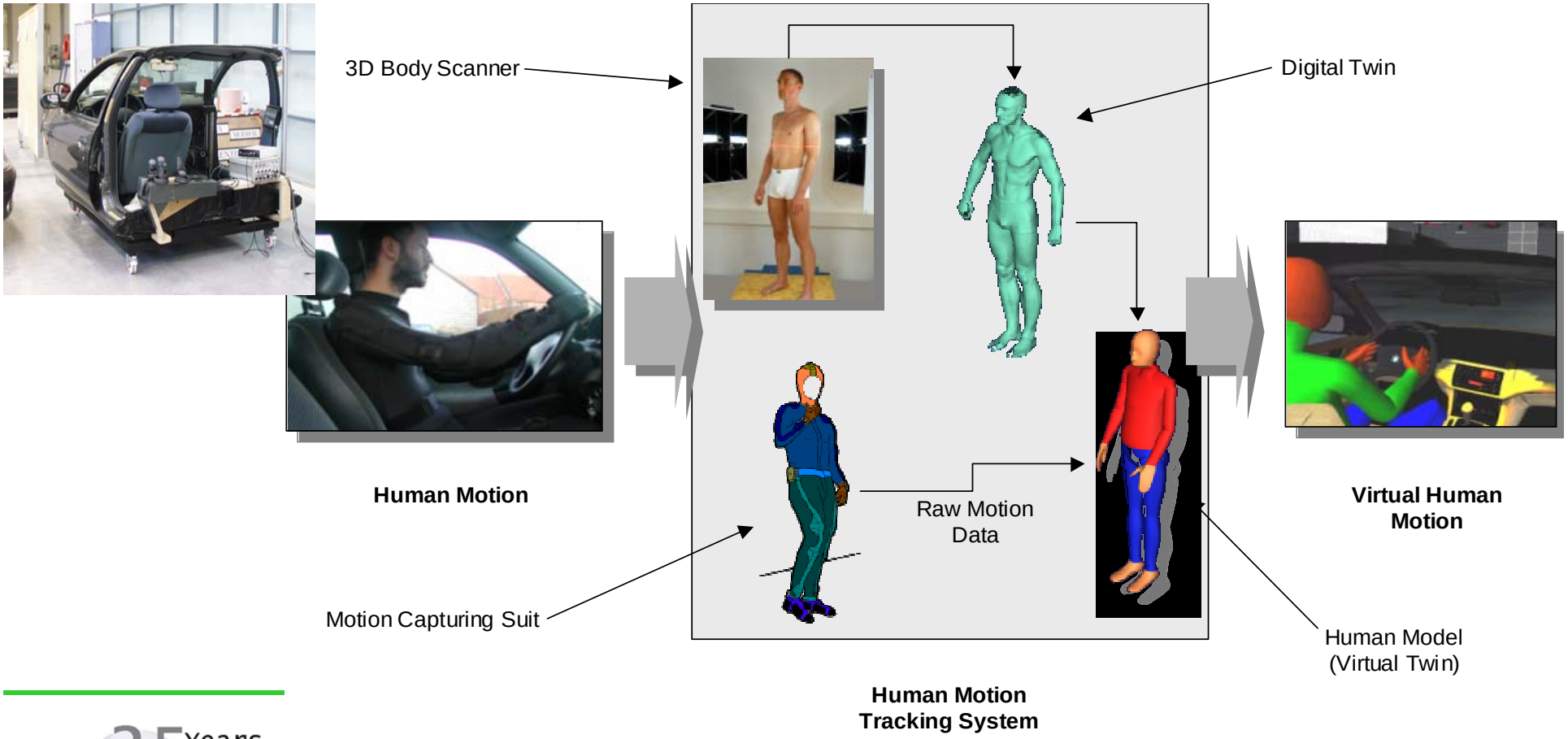
Case Study ALERT

- Program objective
  Development of a motion capture system to support the virtual engineering programs of Renault and Peugeot
  - Improvement of cockpit ergonomics
  - Improvement of the assembly process (ergonomics)

- Key features
  - No ‘line of sight’ (in-car measurement)
  - Good dynamic response (human motion)
  - User friendly (set-up, during measurement sessions)
  - Multiple actor motion capture

VERHAERT

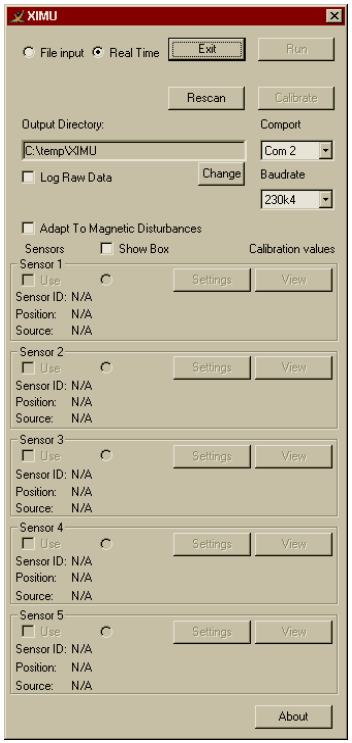
# Case study ‘ALERT’: demonstrator set-up



VERHAERT

# Case studie ‘ALERT’: proof-of-technology

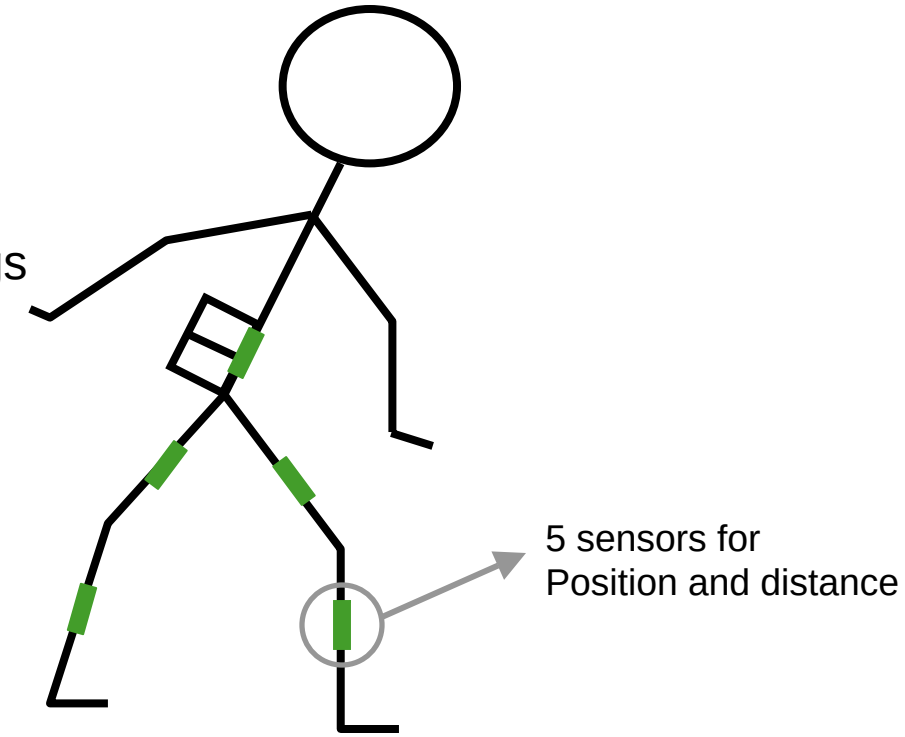
## Proof-of-technology for movement of arms



VERHAERT

# Pedestrian Navigation - PNM

- Functions:
  - distance
  - pattern
- Patented principle
  - orientation of upper and lower legs
  - back sensor for step direction
  - bio mechanical model
- Dead Reckoning



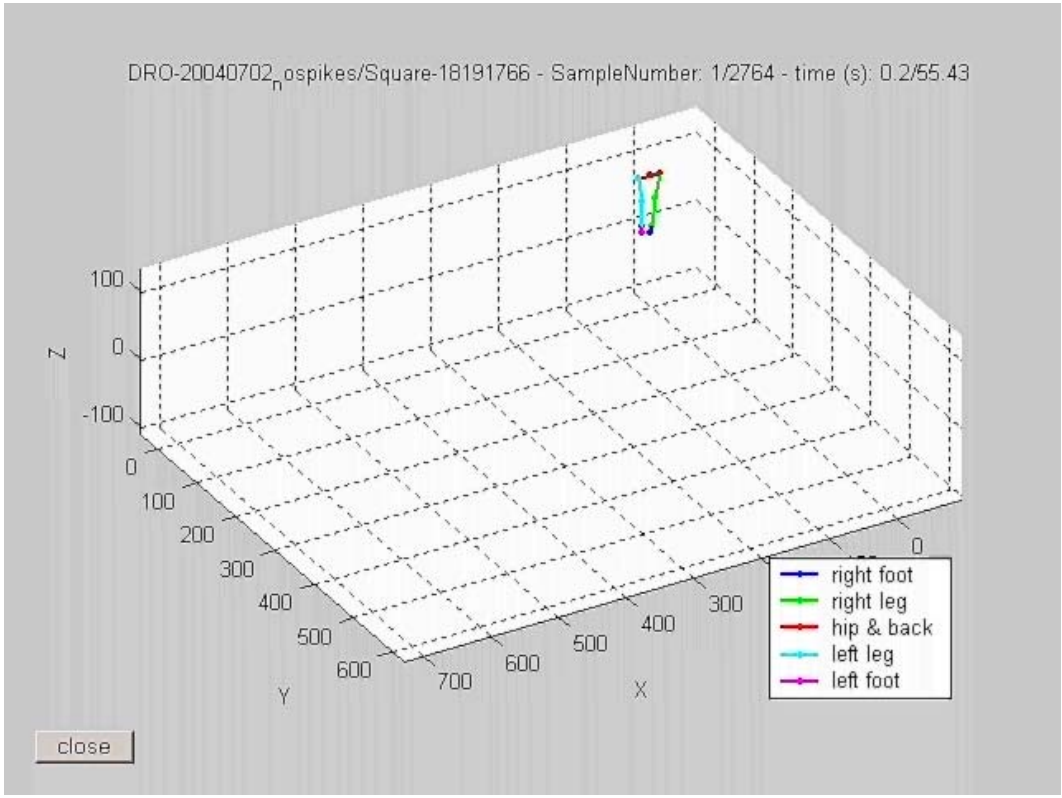

Applications

- Disabled persons
- Rescue & security
- ...

VERHAERT

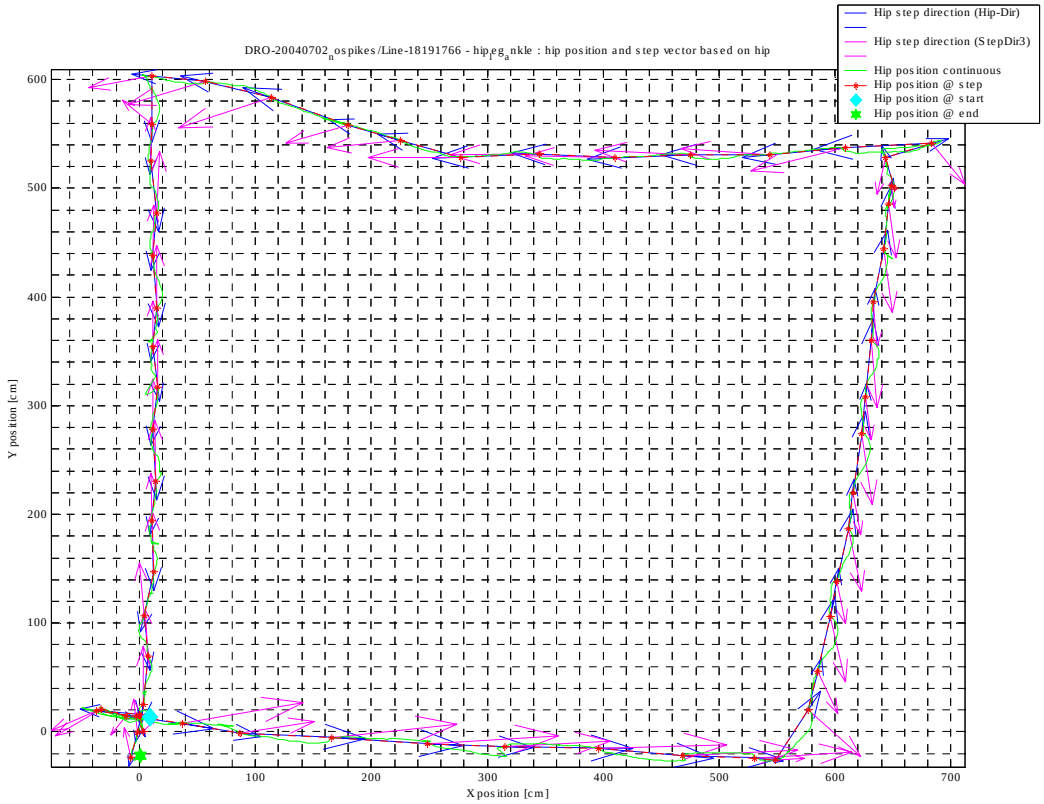
# Pedestrian Navigation

Demonstrating the potential



VERHAERT

# Promising results




First tests indicate a good accuracy:

- Actual rravelled distance: 53 steps or 24m
- Accuracy: 30 cm of 0,5cm per step

VERHAERT

# Contact

Ann Van Mele
Dany Robberecht

Verhaert New Products & Services nv
Hogenakkerhoekstraat 21
9150 Kruibeke
Belgium
Tel +32 (0)3 250 14 14
Fax +32 (0)3 254 10 08
www.verhaert.com
info@verhaert.com