

# Health Decision Support for Professionals, Patients & Policy

prof. Bart De Moor

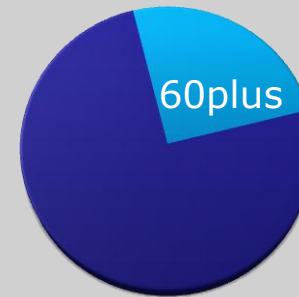
Innovatie en ondernemerschap in zorg  
20 oktober 2011

# Societal trends



## Ageing

Flanders 2012



age related & chronic diseases rise

→ **challenge:** reconcile **quality** with **costs**

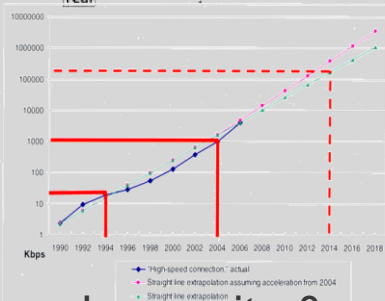
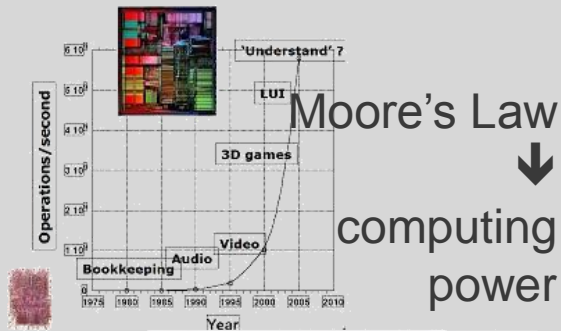
## Patient empowerment → P4 Medicine

- Personalized
- Preventive
- Predictive
- Participatory

→ **challenge:** **patient-centric & personalized** health care

# Technological trends

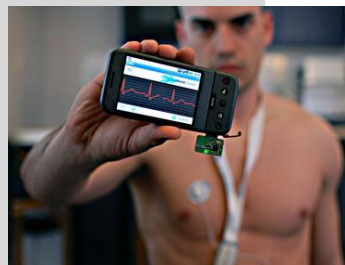
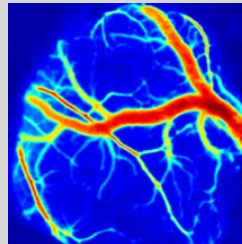
## IT + internet performance & pervasiveness



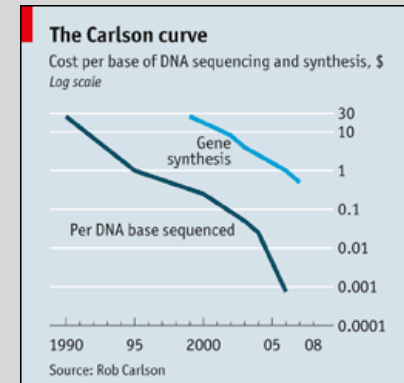
broadband capacity & pervasiveness  
→ data access and sharing

## Monitoring & smart systems

- Variety of imaging modalities
- Multichannel, Wireless, Mobile & Real-Time



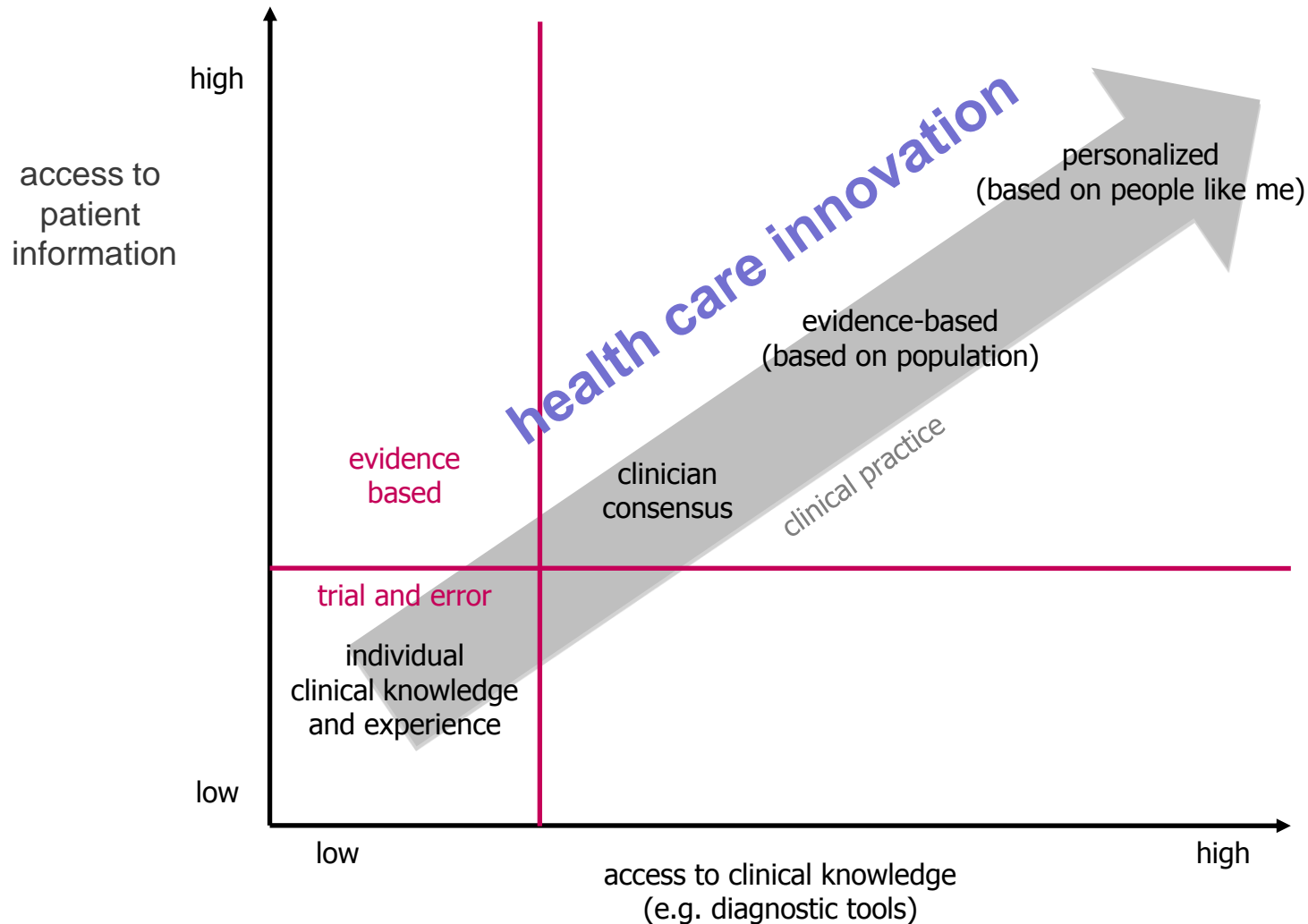
## Biomedical technologies



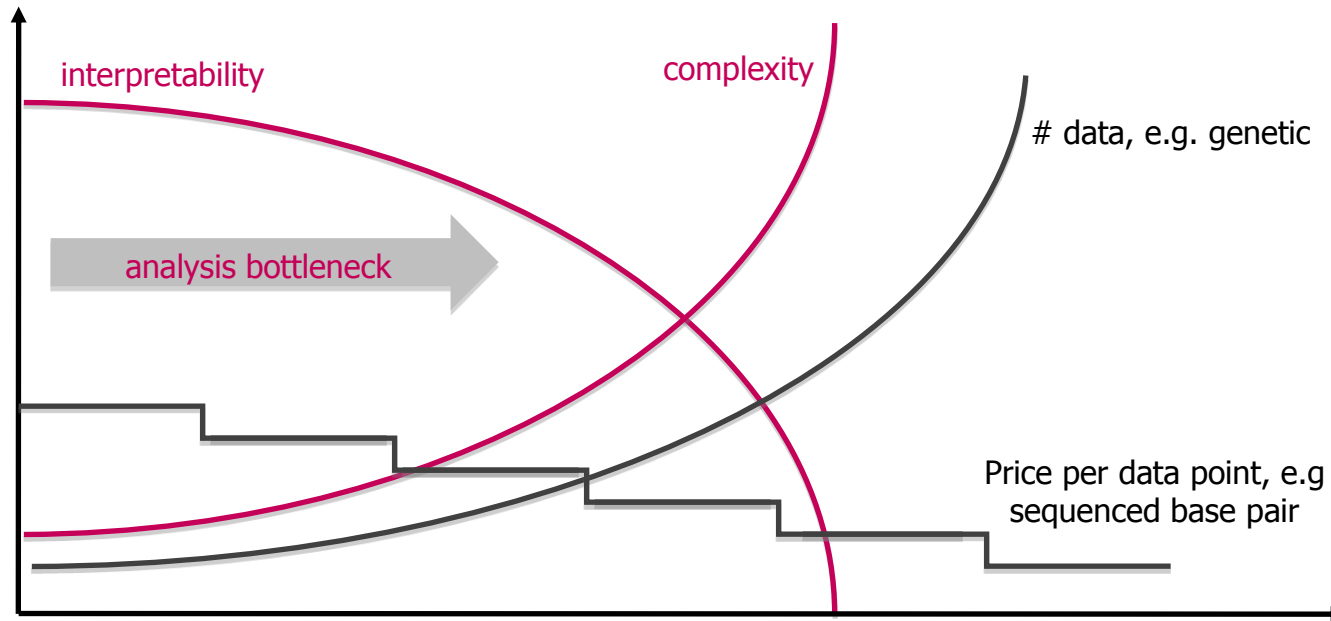
Carlson's law →  
\$1000 personal genome



# Towards evidence-based and personalized medicine



# Challenge: data tsunami



## IT to the rescue!

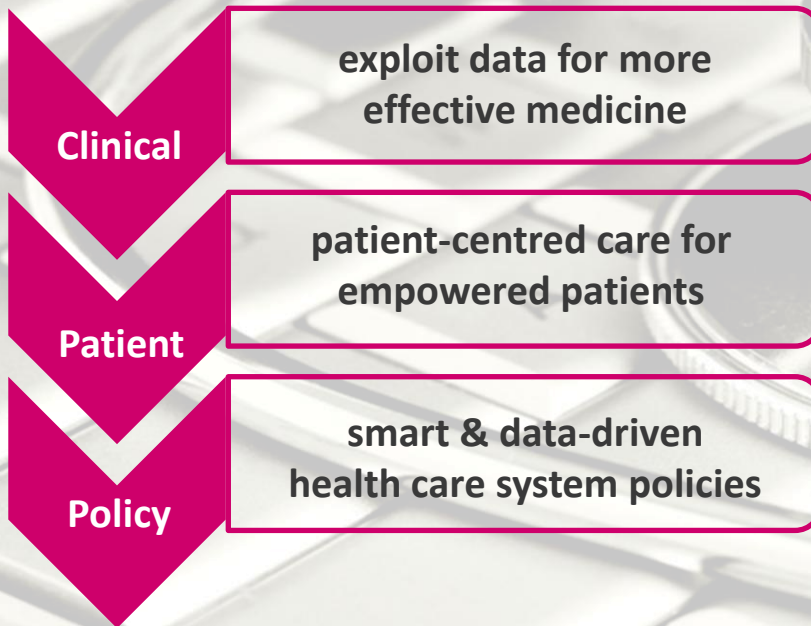
IT, mathematical engineering and software design

→ **fully exploit the opportunities** created by advancing technologies

# IBBT Future Health Department: Health Decision Support

**data:** clinical, biomedical, imaging, omics, health insurance data, medical knowledge ...

- IT & software design
- data processing & mining
- data integration & visualization
- user experience & e-learning



to **extract** appropriate information

to **transfer** this information to the user:  
professional, patient and policy maker

decision support to enable better health care

# Positioning of IBBT

- IBBT = Interdisciplinary Institute for Broadband Technology
- 1 out of 4 strategic research centers (SOC) in Flanders



- Virtual: expertise of university research groups
- Link between research and industry
  - Supporting companies and organizations active in research and development
  - stimulate the development of innovative ICT services and applications in close collaboration with government and industry

# Structure of IBBT: 5 research departments

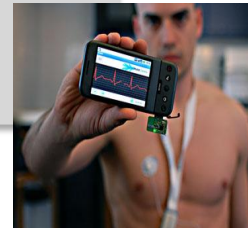
Future Internet

Security

Future Health

Digital Society

Future Media





# Future Health: Research Groups

- bioinformatics & machine learning
- biomedical data processing
- digital signal processing for audio & telecom



- Fac. Engineering  
Dept. ESAT - K.U.Leuven

- bioinformatics & computer science
- education
- linguistics
- statistics



- K.U.Leuven  
campus Kortrijk

- user experience  
research



- Fac. Social Sciences  
K.U.Leuven



- medical imaging
- Fac. Engineering  
Dept. ESAT  
K.U.Leuven

# Future Health: Mission Statement

- create lasting and positive impact on society through IT innovation
- improve quality and cost effectiveness in **health care** through computational research and IT development

## Health Decision Support for Professionals . Patients . Policy

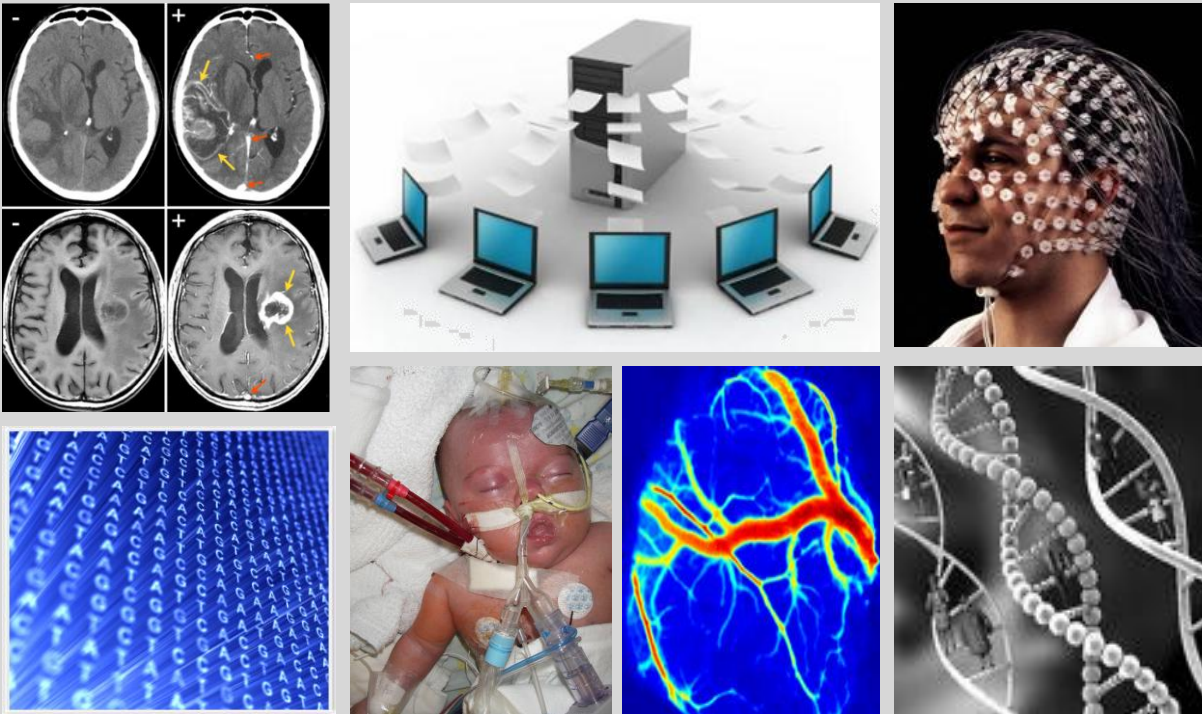
- Dialogue with health care stakeholders
- Demand-driven & interdisciplinary
- Economical & societal valorization

reference center for computational research in health care

# Research Focus

## Clinical Decision Support

- interpretation of wide range of data
- demand-driven, user-centred, with future vision



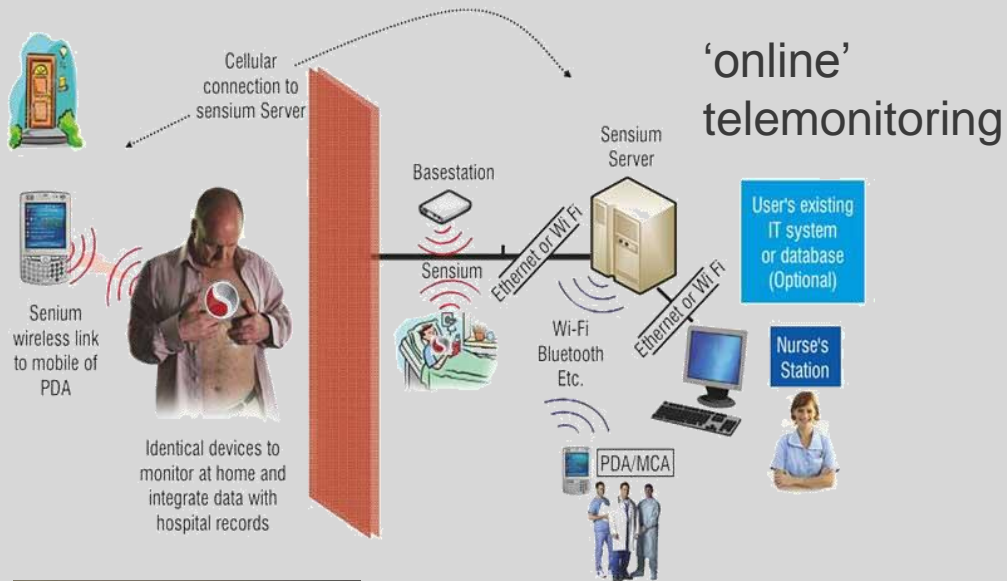
Patient  
DS

Policy  
DS

# Research Focus

## Clinical DS

### Patient Decision Support



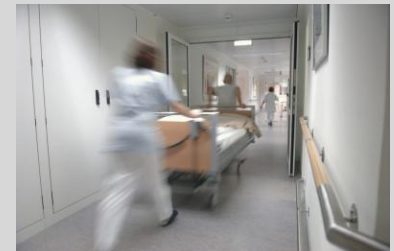
'patient empowerment':  
e.g. disease management  
for patients with chronic  
diseases using new media

## Policy DS

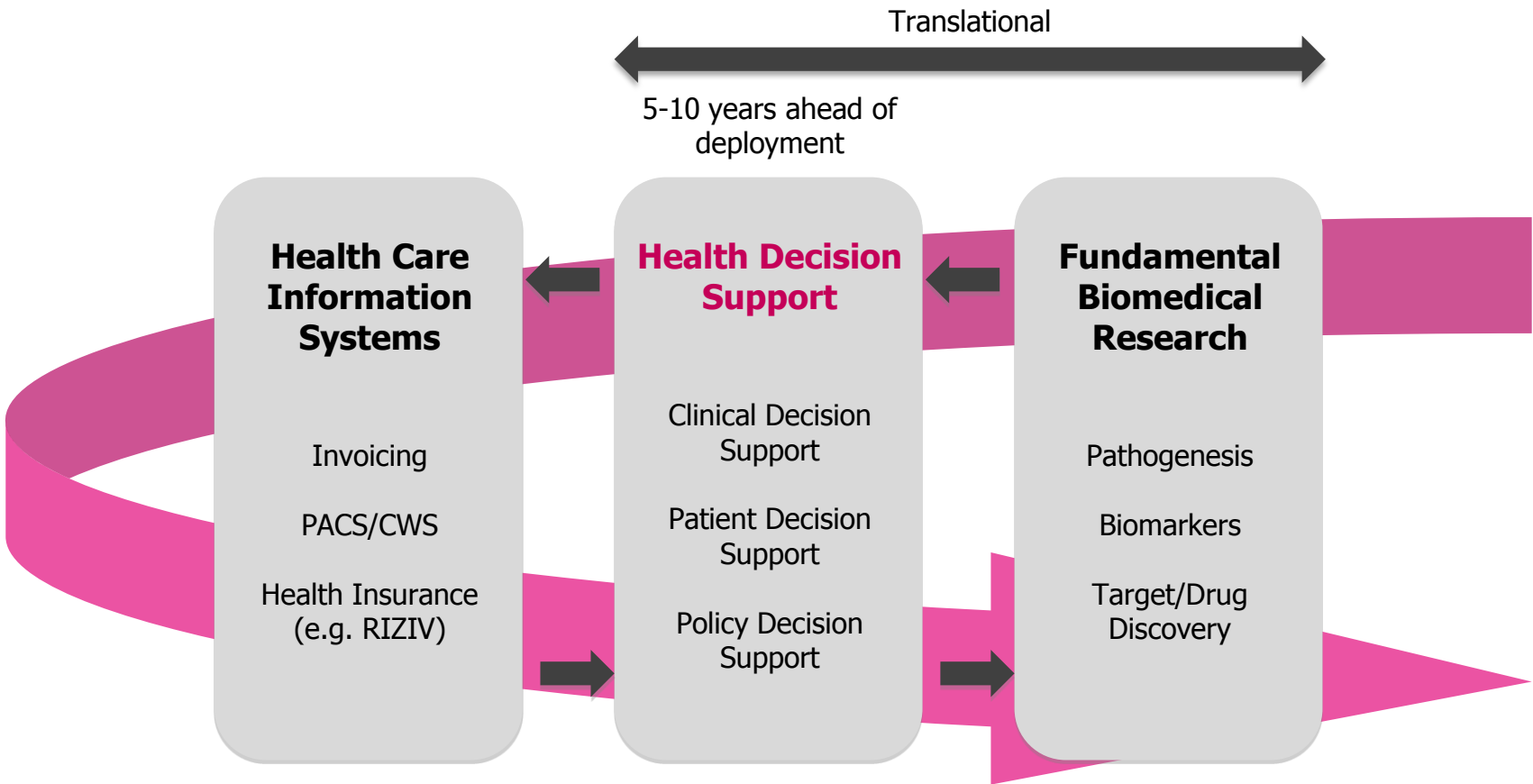
- data mining to identify best practices, ...



- hospital logistics



# Future Health: Positioning



# Through dialogue with stakeholders

key to accessible and efficient health care = **dialogue**  
between research, technology and health care

## research

universities & research centres

strategic research centers: IBBT, imec, VIB, VITO

...

## health care stakeholders

patients

hospitals

doctors

health insurance

health care policy

...



## technology providers & core facilities

industry

supercomputing

medical imaging center

usability lab

sequencing (Genomics Core)

...

# Track Record



Cartagenia

data handling & mining  
for clinical genetics



*in silico*  
drug  
discovery

**icoMetrix**  
*Quantifying Your Images*

image quantification

**P Y X I M A**  
SOCIAL INTEREST SOFTWARE SERVICES

social interest software



medical image computing



home monitoring for  
epilepsy detection

**VISION++**  
Experts in Computer Vision

<http://www.visionplusplus.com>

vision software & hardware

**televic**  
education  
(e-)learning solutions



Theraplay: ergotherapeutic game

# Track Record

- 17 PI, 25 postdocs, 88 PhD students
- ~ 270 publications /year
- ~ € 5 million external financing /year
- ~ 15 PhDs /year
- ~ 40 patents
- 5 spin-offs launched since 2005





# Conclusion

## Trends

improve health care quality and cost effectiveness



## Decision Support for Professionals, Patients & Policy



**Clinical**

exploit data for more effective medicine

**Patient**

patient-centred care for empowered patients

**Policy**

smart & data-driven health care system policies

- Dialogue
- Demand-driven
- User-centred
- Future vision

**IBBT-K.U.Leuven  
Future Health Department**

**[www.kuleuven.be/ibbt](http://www.kuleuven.be/ibbt)**

