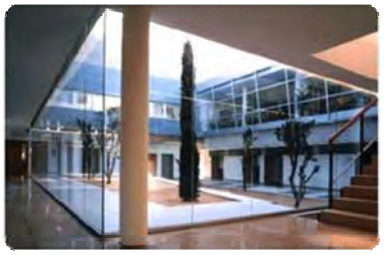


Computer Vision in Barcelona

Petia Radeva

University of Barcelona &
Computer Vision Center

Presentation to: AComIn: Advanced Computing for Innovation

The Computer Vision Center

- CVC is a legally independent, non-profit institution founded in 1995 by the Generalitat de Catalunya and the Universitat Autònoma de Barcelona (UAB).
- Specialists and leaders in the field of computer vision.
- More than 130 multidisciplinary researchers and technicians of different nationalities.
- Advanced resources in Computer Vision hardware and software
- 2000m^2 devoted to R&D of excellence on Computer Vision.

Vision & Mission

Vision

The CVC claims to be recognized as:

- R+D European **leader in Computer Vision**
- A consolidated public institution guided by the quality and volume of its **scientific** production on computer vision; as well as by its knowledge **transfer** and its **drive for society development**
- A reference in the **exchange, integration and mobility** of researchers on an international scale
- An institution within the UAB framework that offers an innovative, attractive and applied **postgraduate** education with international vocation
- A model that is driven by the **clients satisfaction**
- A link to the **industrial network**

Mission

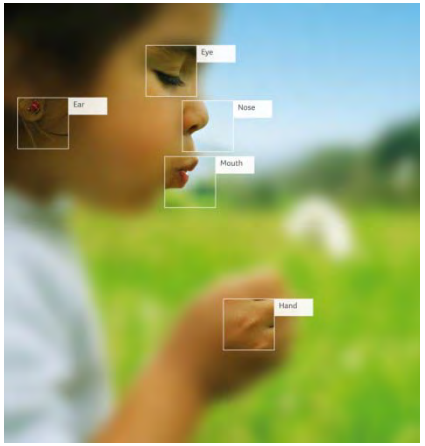
Carry out research of **renowned quality and international impact**. **Transfer knowledge** towards companies and society. **Train** high-level scientists

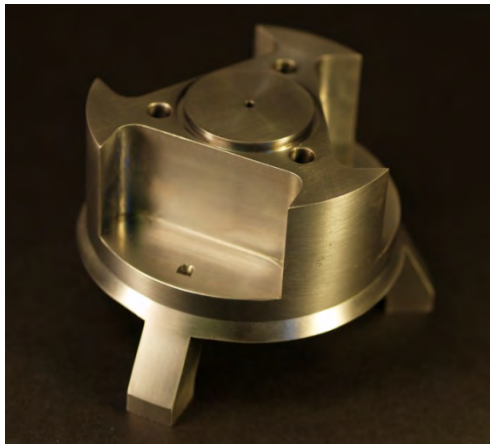
The CVC in the UAB Research Park and the UAB30 initiative

Main Activities

Cutting edge research

- Medical image analysis
- Visual object recognition
- Document analysis
- Image understanding
- Color and texture
- On board vision
- Visual perception
- Machine vision
- Multimedia indexing and retrieval
- Video surveillance interpretation
- Interactive 3D visualization and augmented reality



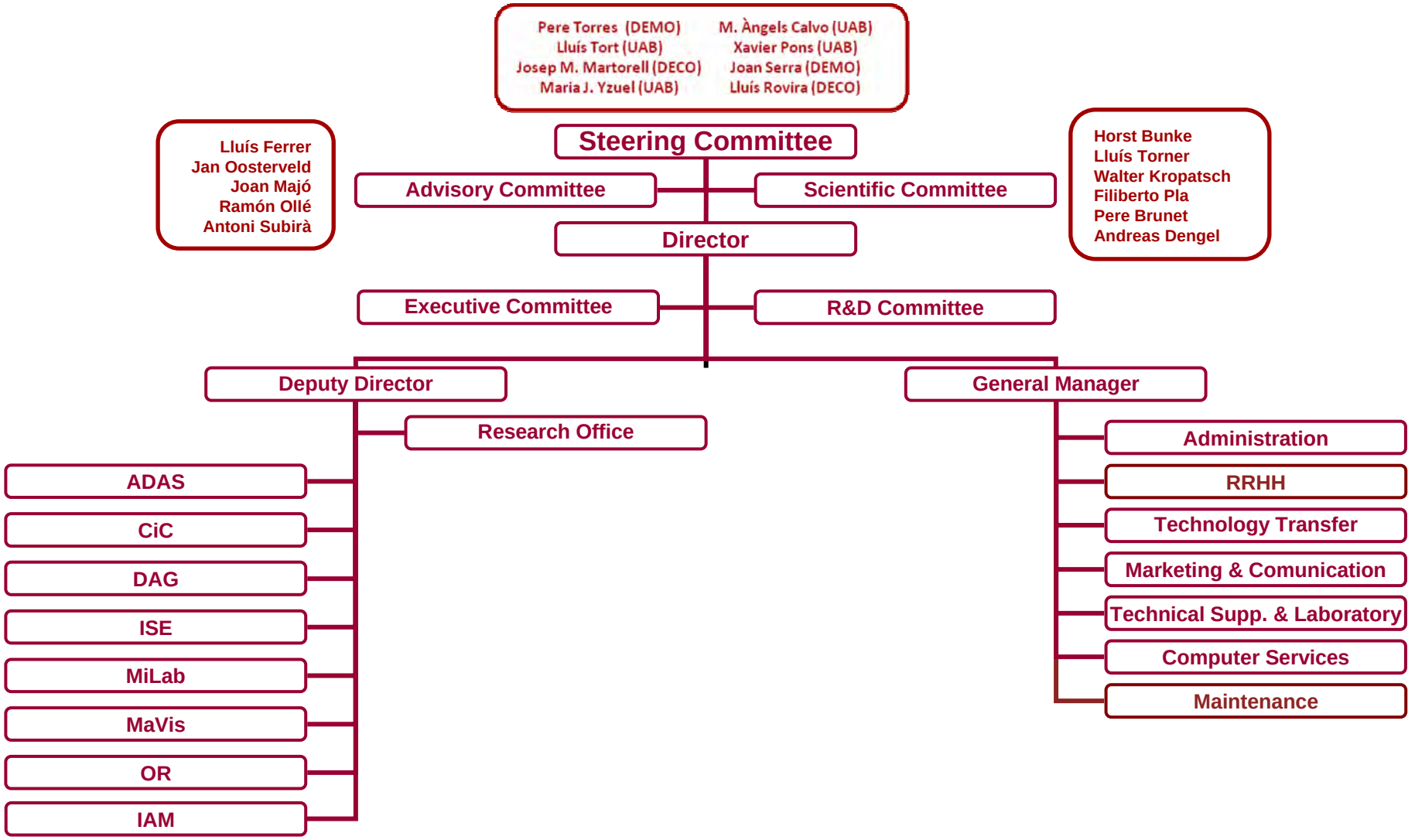


Technological Transfer & Consultancy

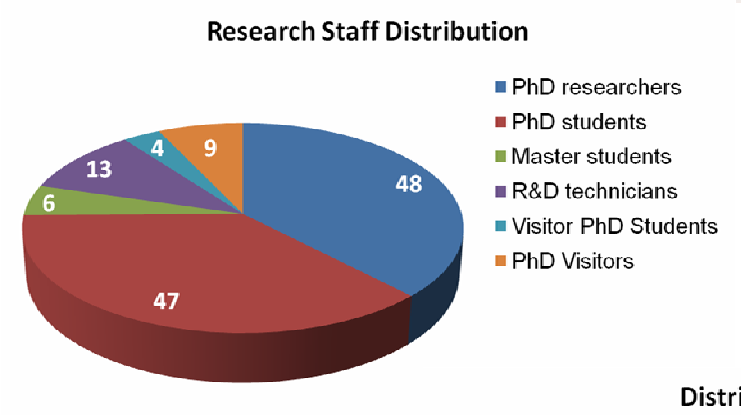
Education & Training

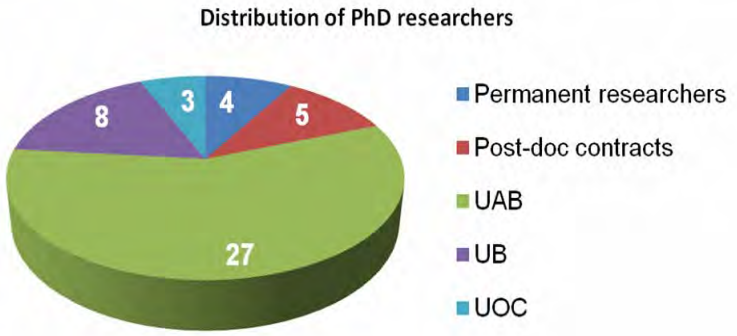
- Master Program (UAB & IIIA)
- PhD Program (UAB)

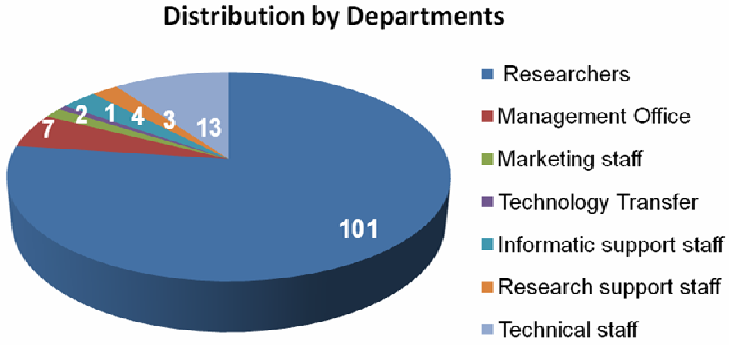
Organization Chart

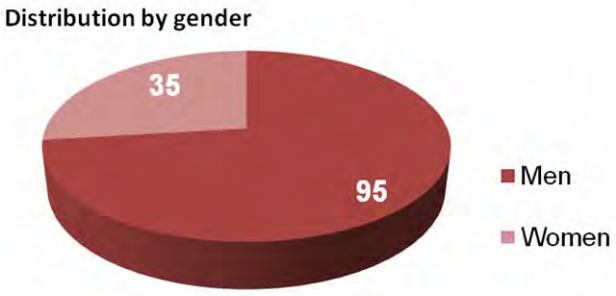


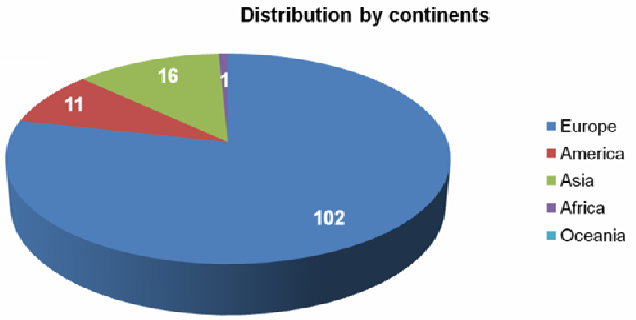
Personnel


Research Staff Distribution
PhD researchers
PhD students
Master students
R&D technicians
Visitor PhD Students
PhD Visitors
48
47
6
13
4
9

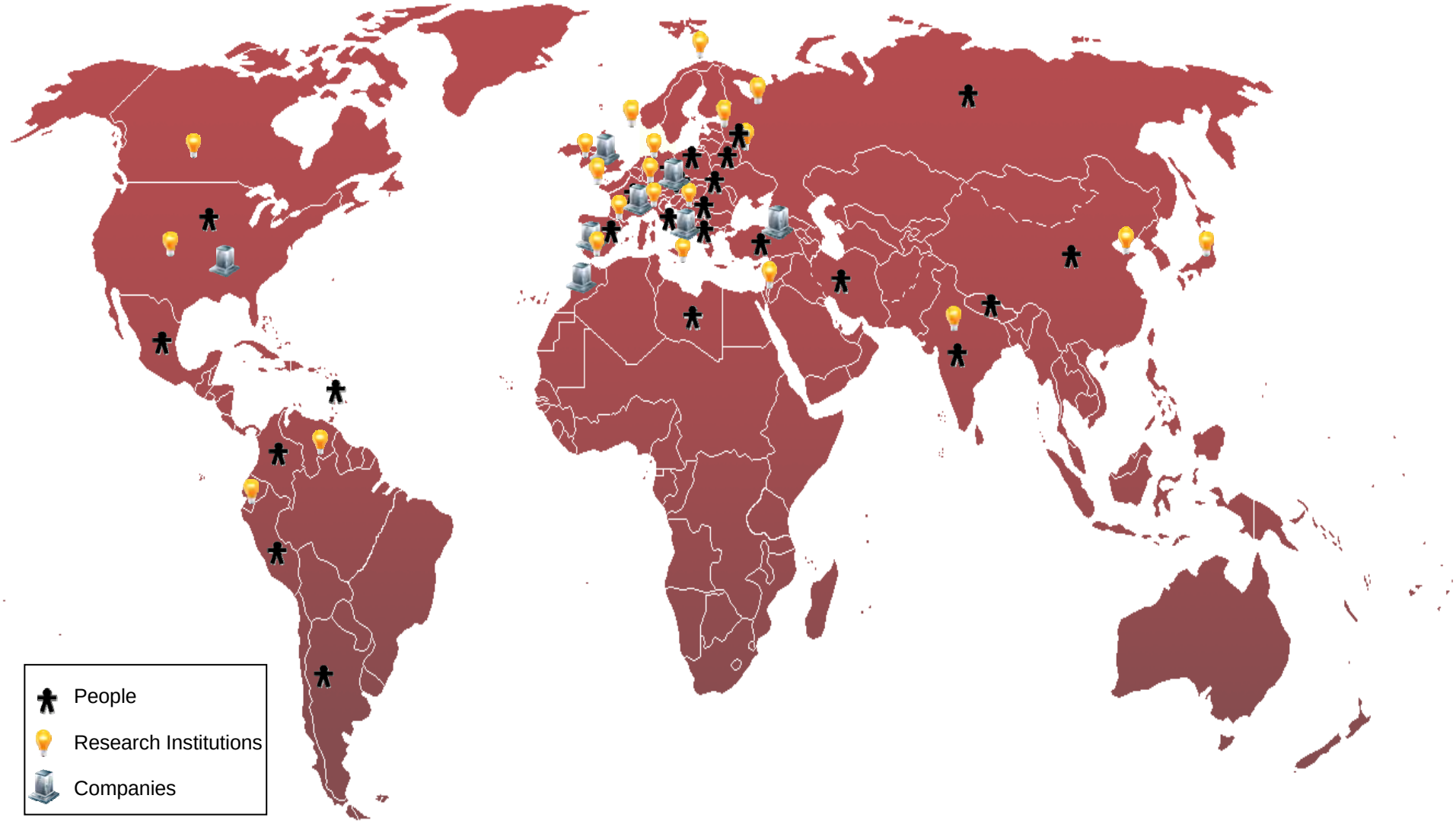

Distribution of PhD researchers
Permanent researchers
Post-doc contracts
UAB
UB
UOC
27
8
3
4
5


Distribution by Departments
Researchers
Management Office
Marketing staff
Technology Transfer
Informatic support staff
Research support staff
Technical staff
101
7
2
1
4
3
13


Distribution by gender
Men
Women
95
35


Distribution by continents
Europe
America
Asia
Africa
Oceania
102
11
16
1

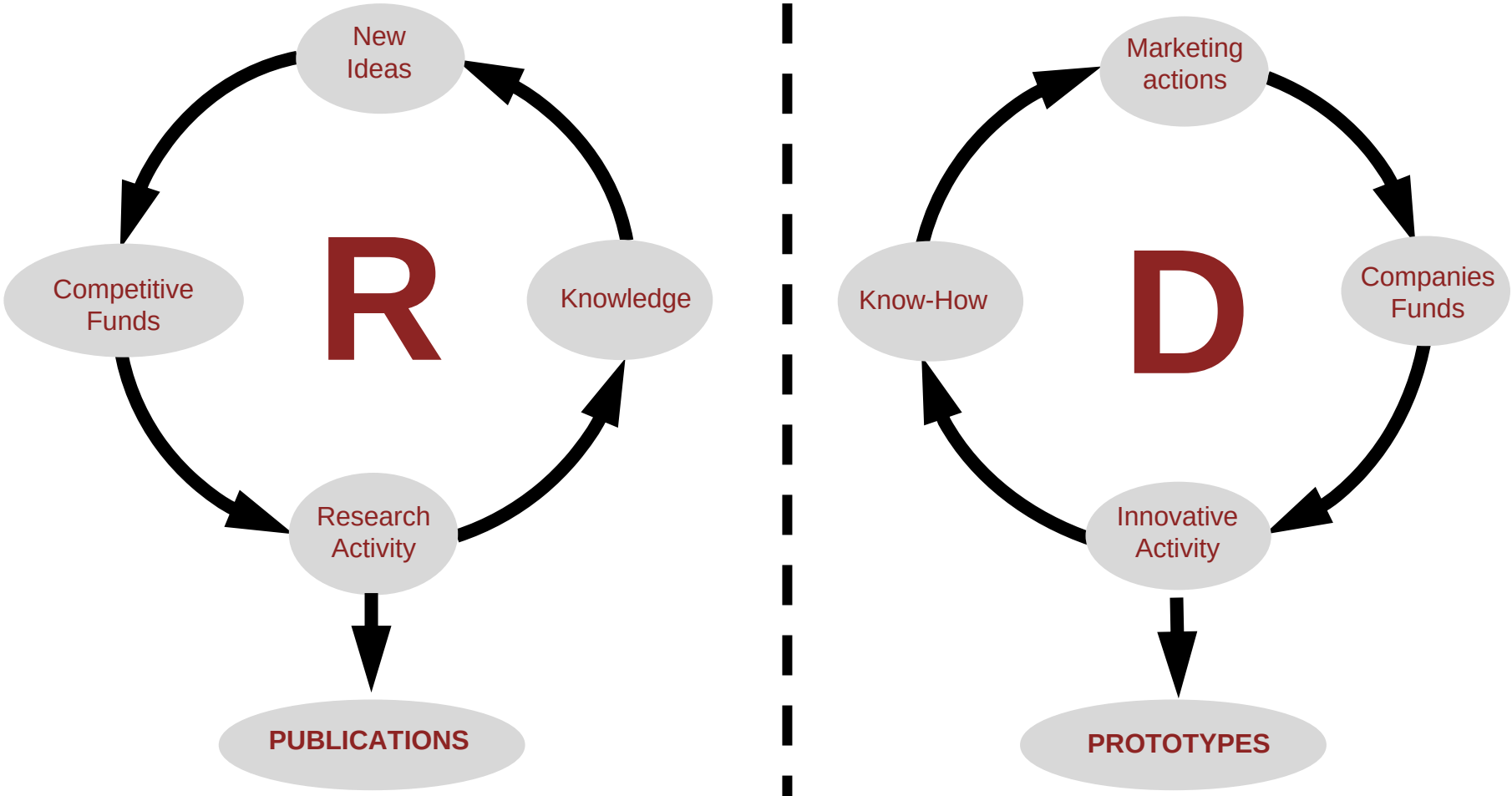
International impact



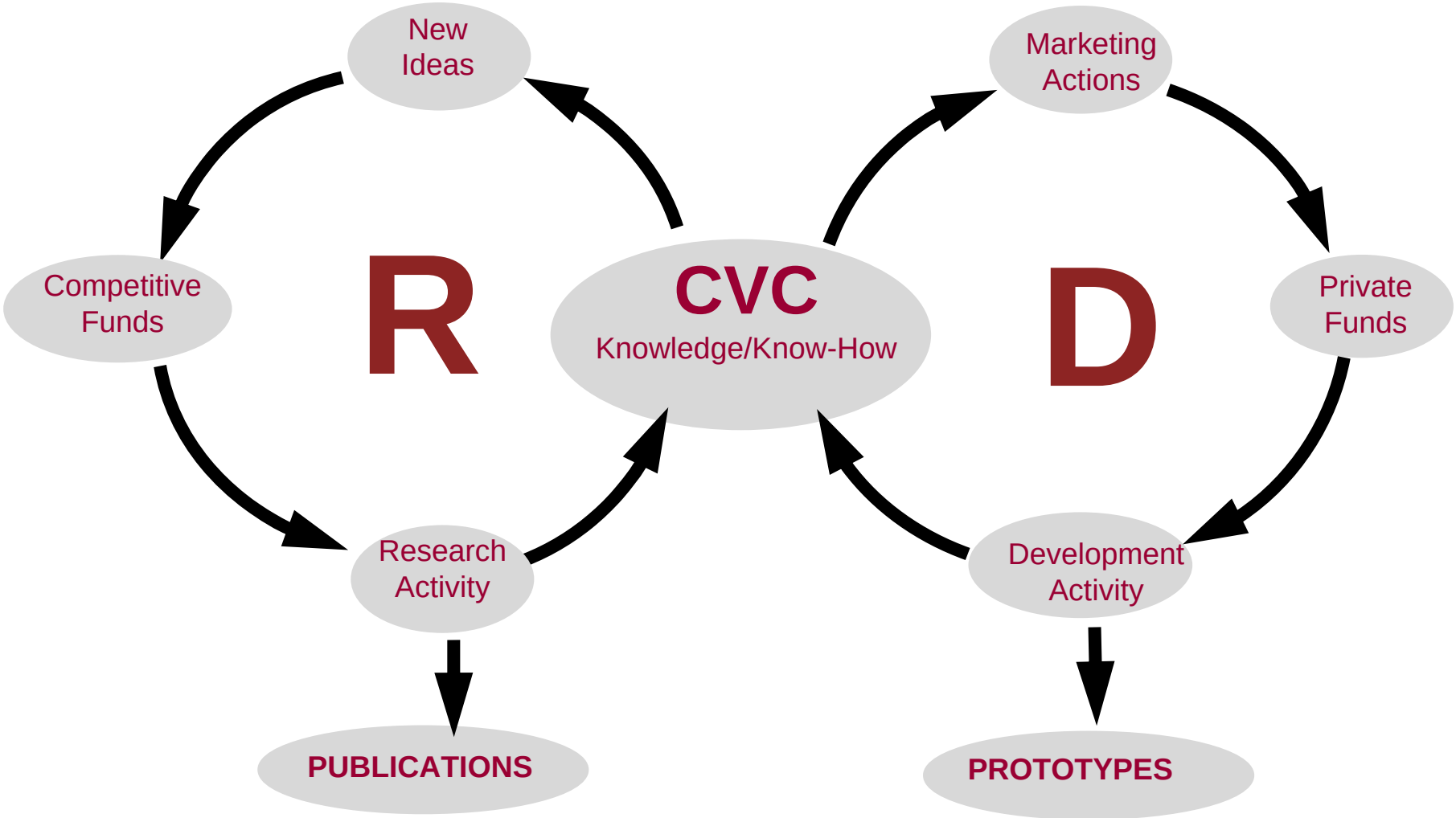
CVC Features

- Specialization in **Computer Vision** as a horizontal field.
- Focus to both **Research and Development**.
- **Mixed (engage and associate) researchers and developers.**
- **Collaboration with Technological Companies**.
- A **middle size** and **flexible** Institution.
- A **reference centre** for companies.
- **Multidisciplinary** personnel: Computer Science, Mathematics, Physics, Telecom and Electronic Engineering specialists.

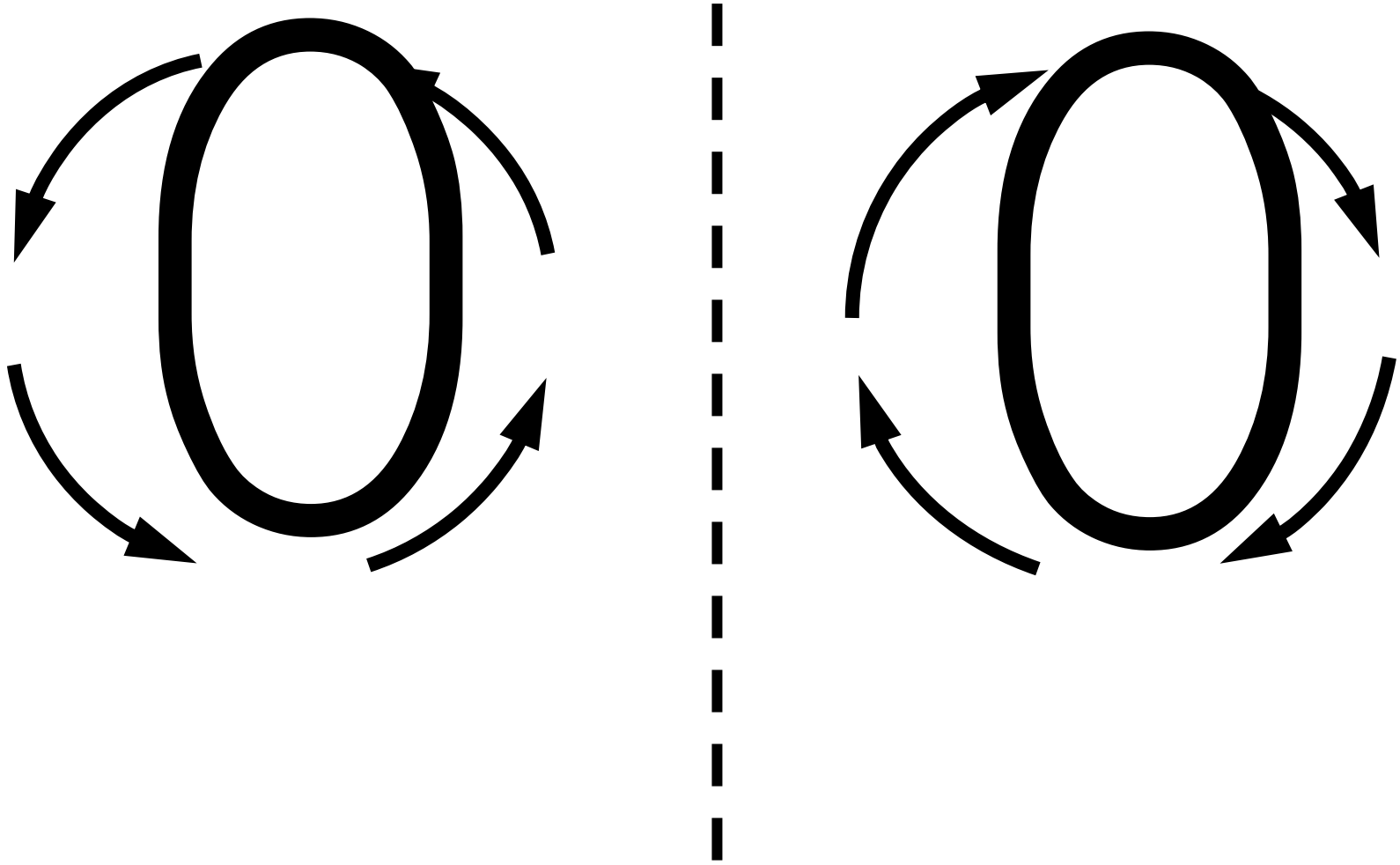
Models of R and D Without Cooperation



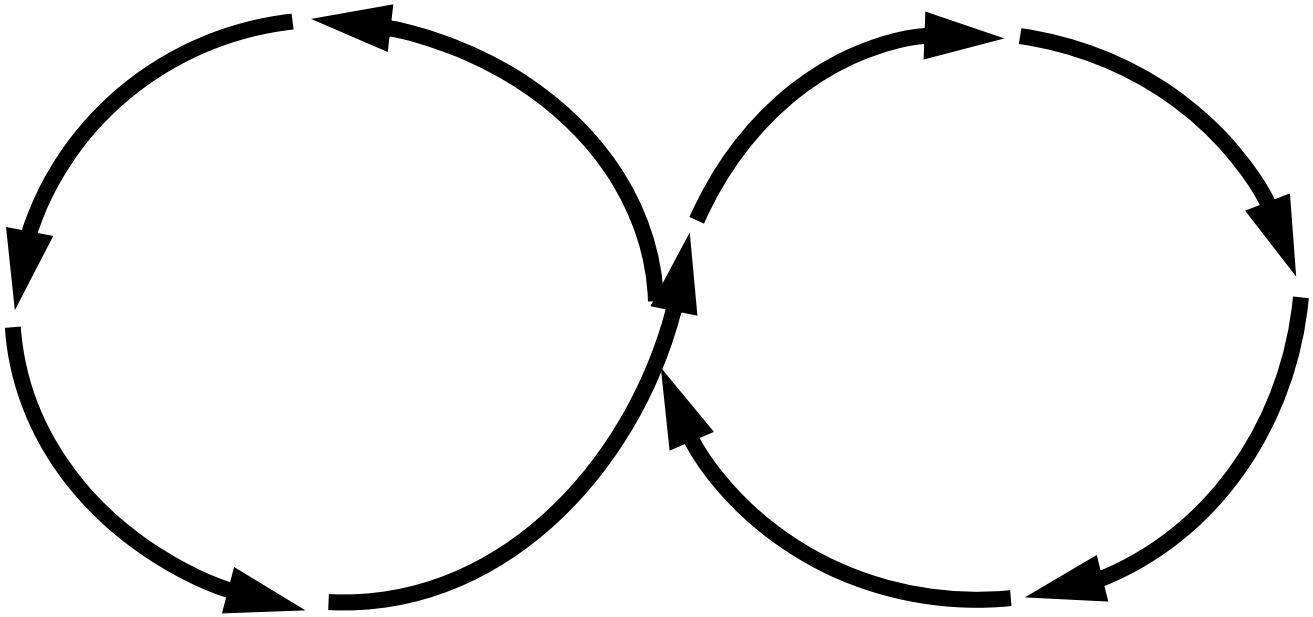
CVC Model of R&D Cooperation



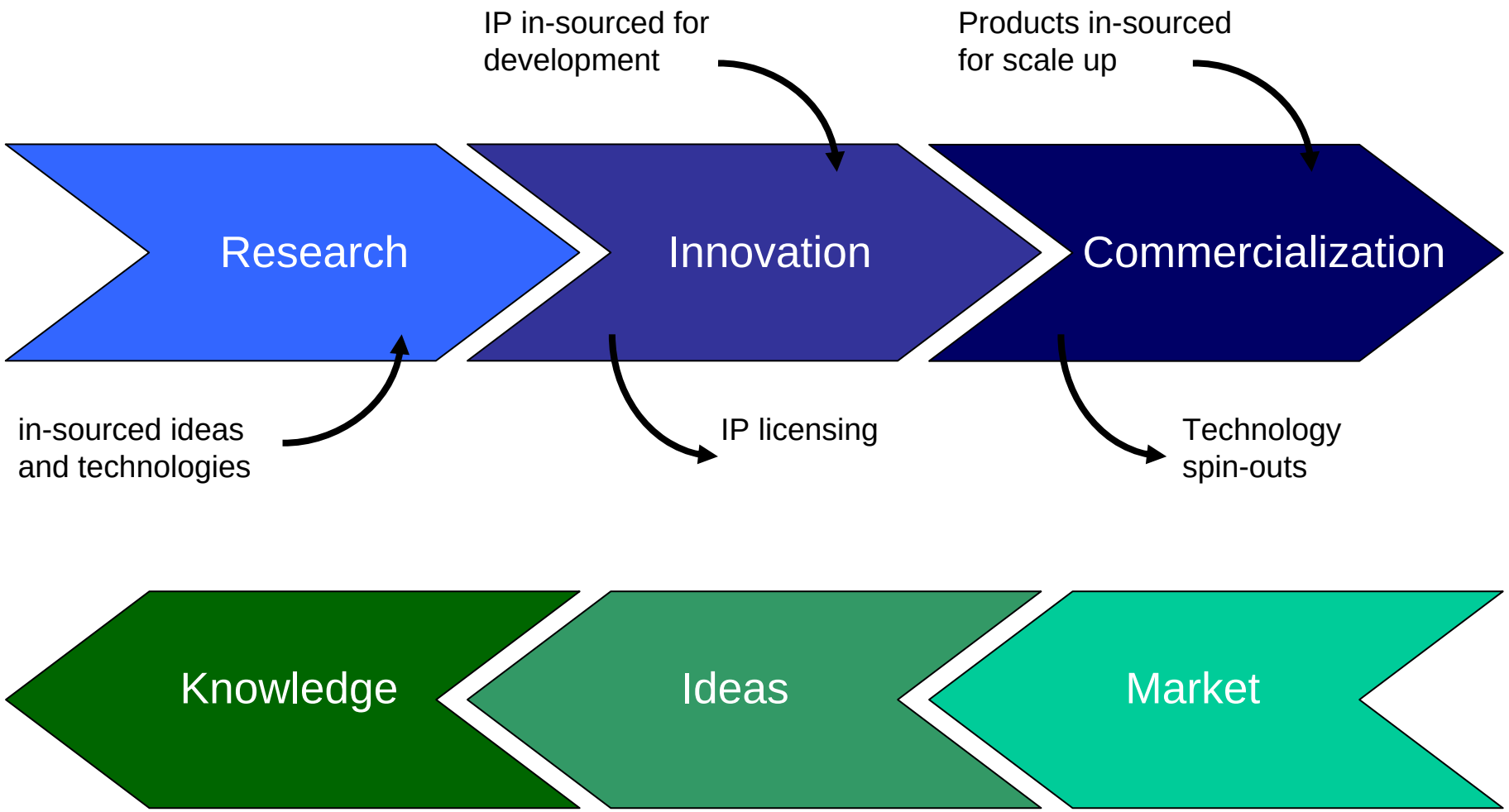
Models of R&D Without Cooperation



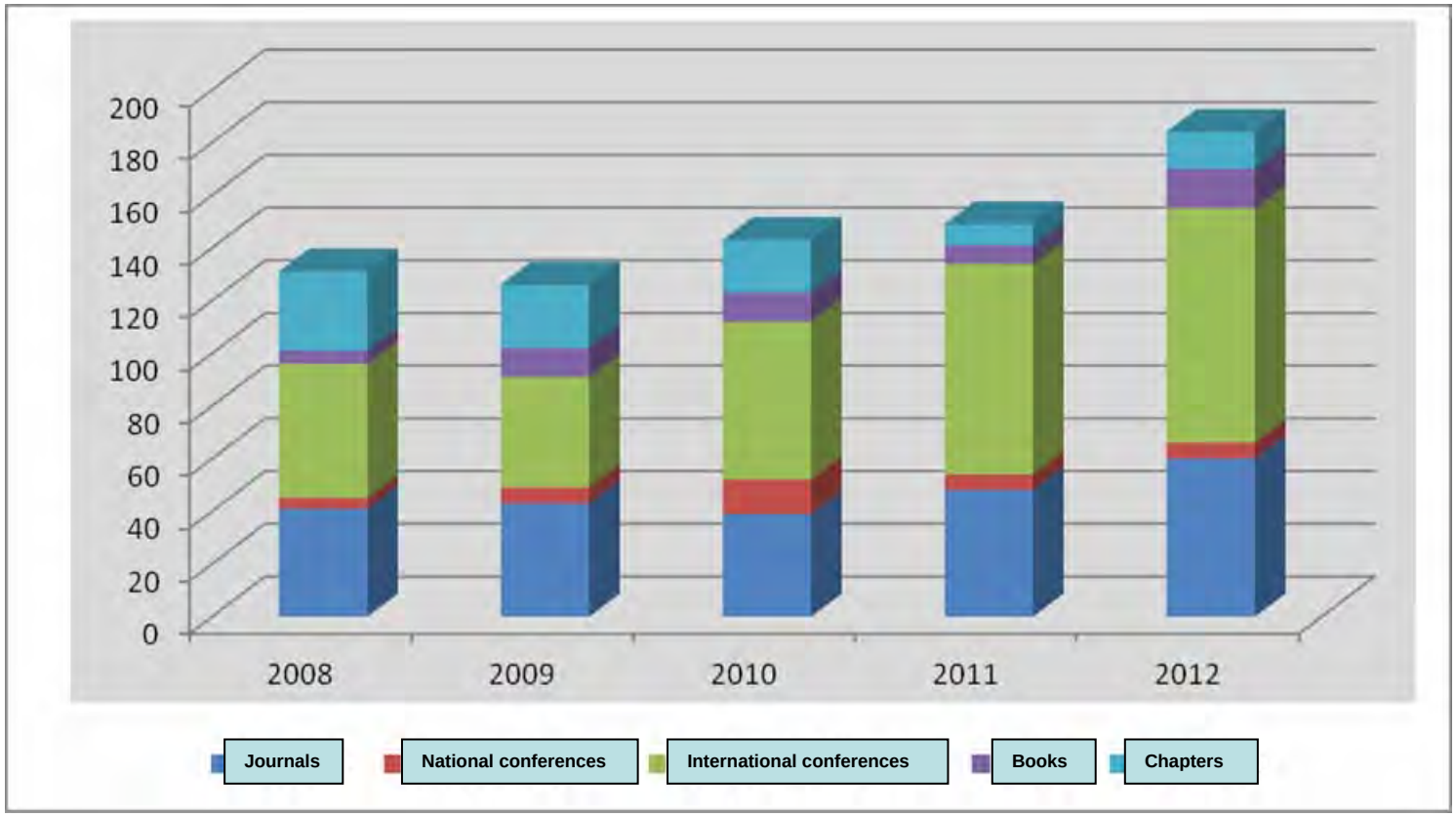
CVC: Model of R&D



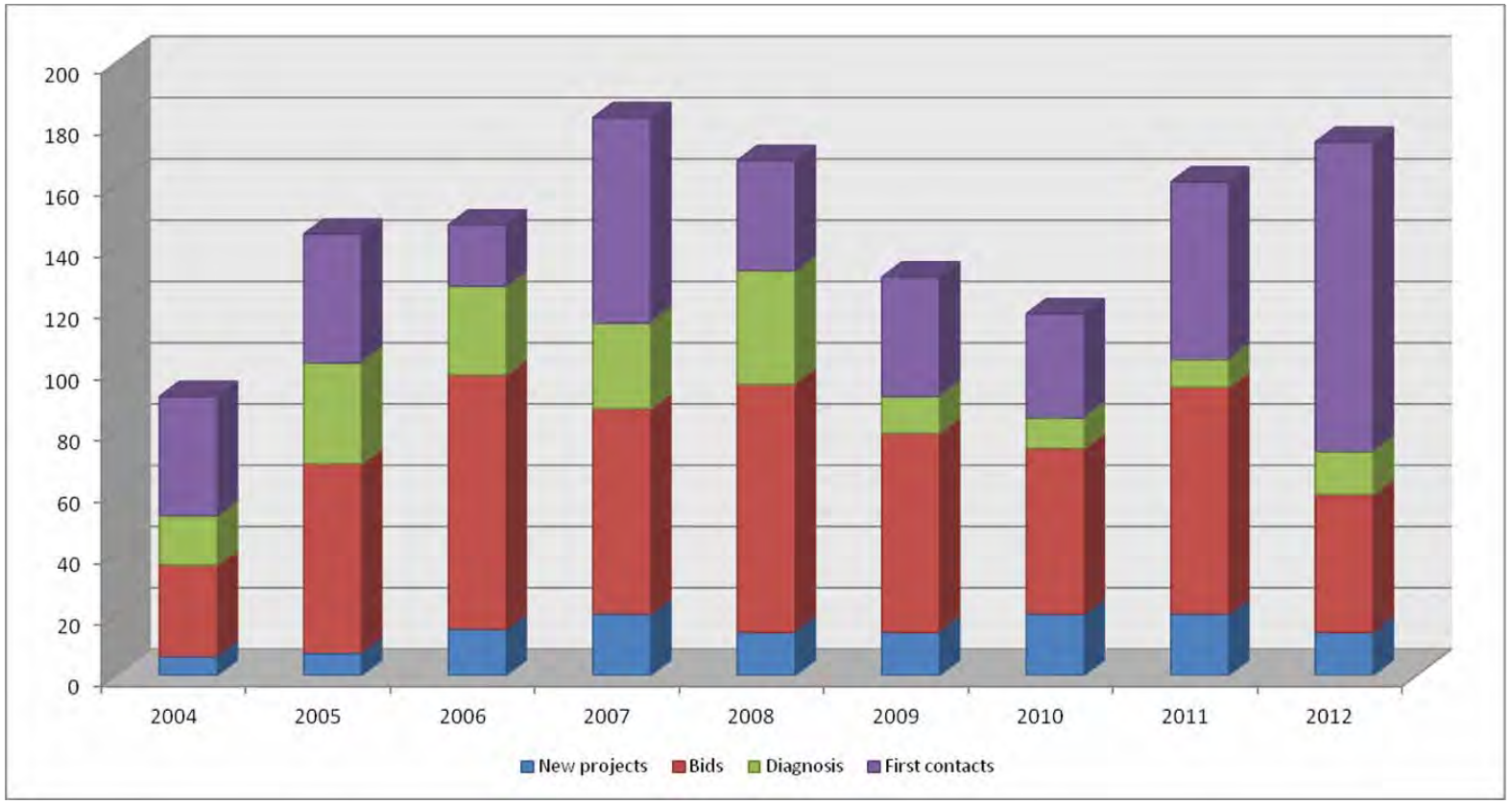
The Open Innovation Paradigm



Publications



Transfer indexes



Current International Competitive Projects

7 FRAMEWORK PROGRAM (FP7-PEOPLE-2008-IAPP: 230653)
"ADAO: Administrative Document Automate Optimization"
2009-2013 - 184k €

ITEA2 European Project VICOMO (TSI-020400-2009-133)
"ViCoMo: Visual Context Modeling"
2009-2011 - 160k €

EUREKA European Project SCANPLAN(Eureka E!-4462)
"ScanPlan: Architectural plans recognition"
2008-2011 – 220k €

7 FRAMEWORK PROGRAM (FP7-269796)
"5CofM: Five Centuries of Marriages"
2011-2015 – 397k €

ITEA2 European Project DICOMA (Itea2-10031)
"DICOMA: Disaster Control Management"
2011 – 35k €

Why CVC

The main asset and guarantee of our work are the confidence placed by our partners for over 15 years, experiencing at first hand our expertise and professionality.

- More than 300 projects and feasibility studies.
- 7 Spin-offs already launched.
- More than 150 companies among our customers.

Spin-offs

VISUAL TAGGING SERVICES (2012): Mobile apps.

CLOUD SIZING SERVICES (2012): Sizing clothing.

DAVANTIS (2005): Smart surveillance.

INSPECTA (2003): Cork quality control.

ICAR Vision Systems (2002): Systems for personal documents.

VISUAL CENTURY (2001): Video indexing.

VISIÓ I ROBÒTICA APLICADA (VyRA) (1998): Computer Vision solutions.

Collaborations with the Catalan R&D system

CERCA

CED
CREAF
I2CAT
CTFC
CTFC
IGTP
IMIM
IR-Sant Pau
VHIR
IRTA

TECNIO

ASCAMM
LEITAT
BCNDigital
AIICA
CTM
CETEMMSA
CISTIB

OTHERS CENTRES

BSC
IIIA
CRIC
IRI
Fundació CIM
UDIAT

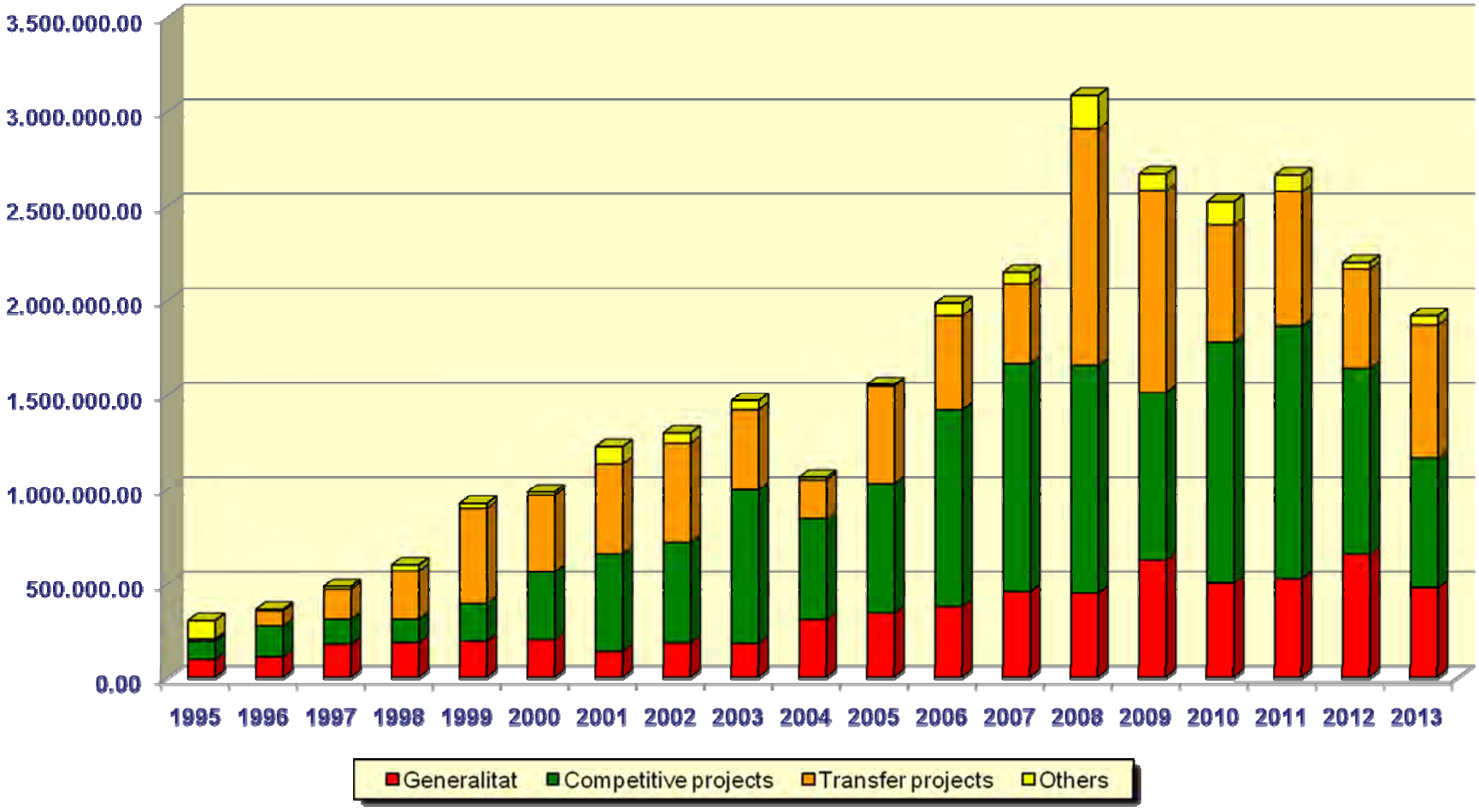
TECNIO GROUPS

CEPHIS (CAIAC)
ViCOROB
CD6
UDTIA (IIIA)

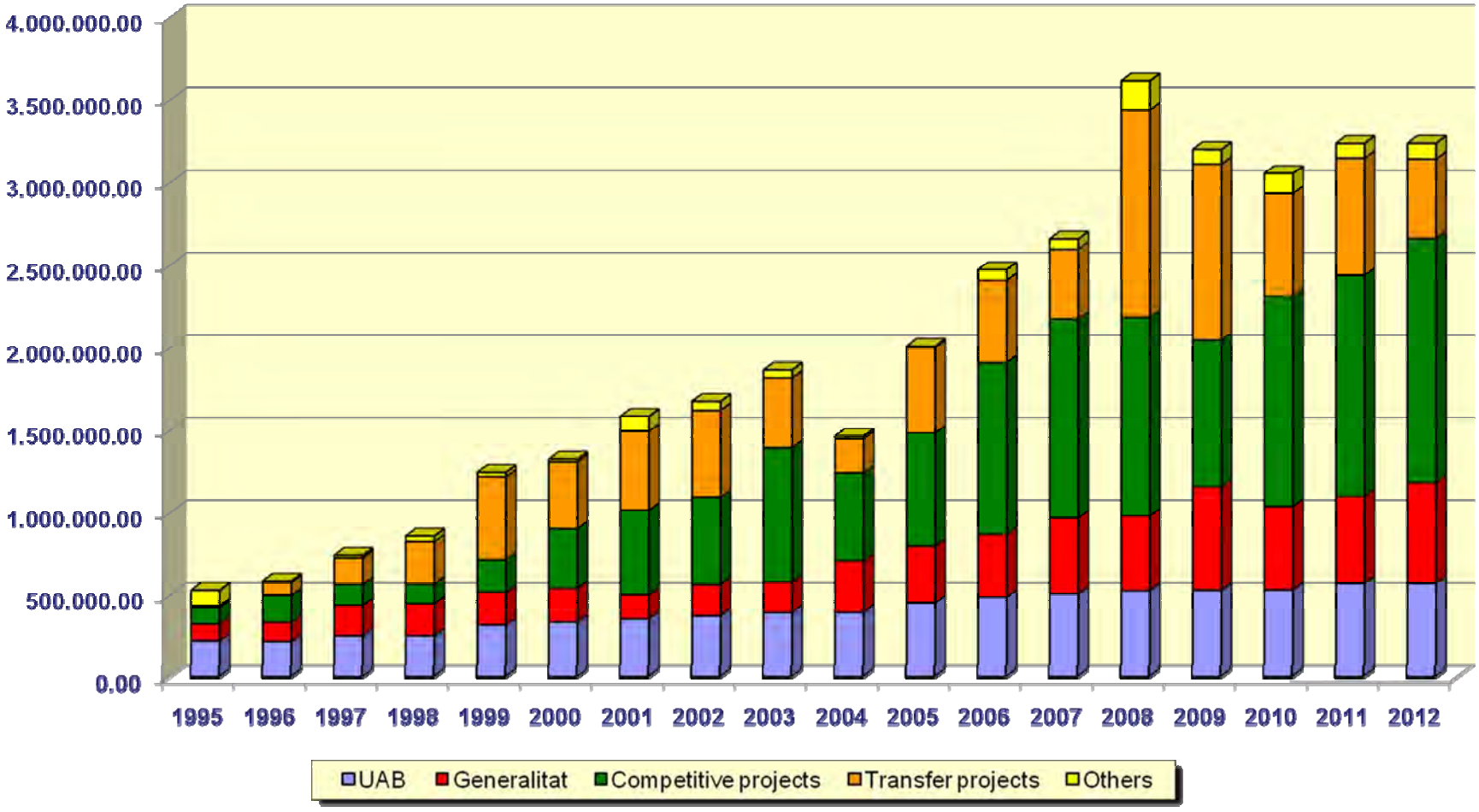
HOSPITALS

TRIAS i PUJOL
PARC TAULÍ
SANT JOAN DE DEU
VALL D'HEBRON
VERGE DE LA CINTA DE TOROSA

Income Evolution (euros)



Income Evolution (euros)

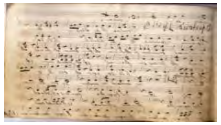


Sectorial focus of the R&D groups

ADAS: Advanced Driver Assistance Systems

ISE: Image Sequence Evaluation

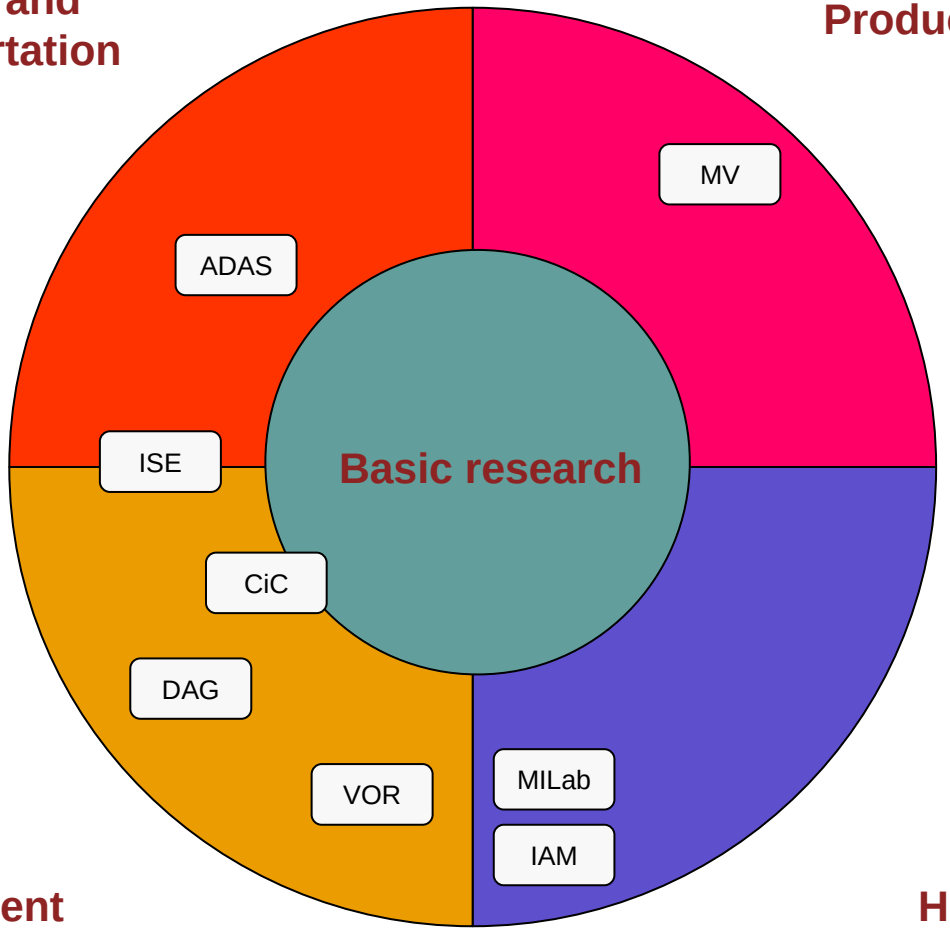
DAG: Document Analysis Group



VOR: Visual Object Recognition

Mobility and transportation

Production

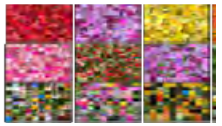


Intelligent contents and media

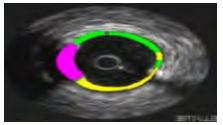
Health and wellfare

MV: Machine Vision

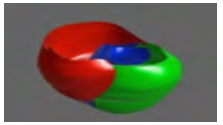
CIC: Colour In Context

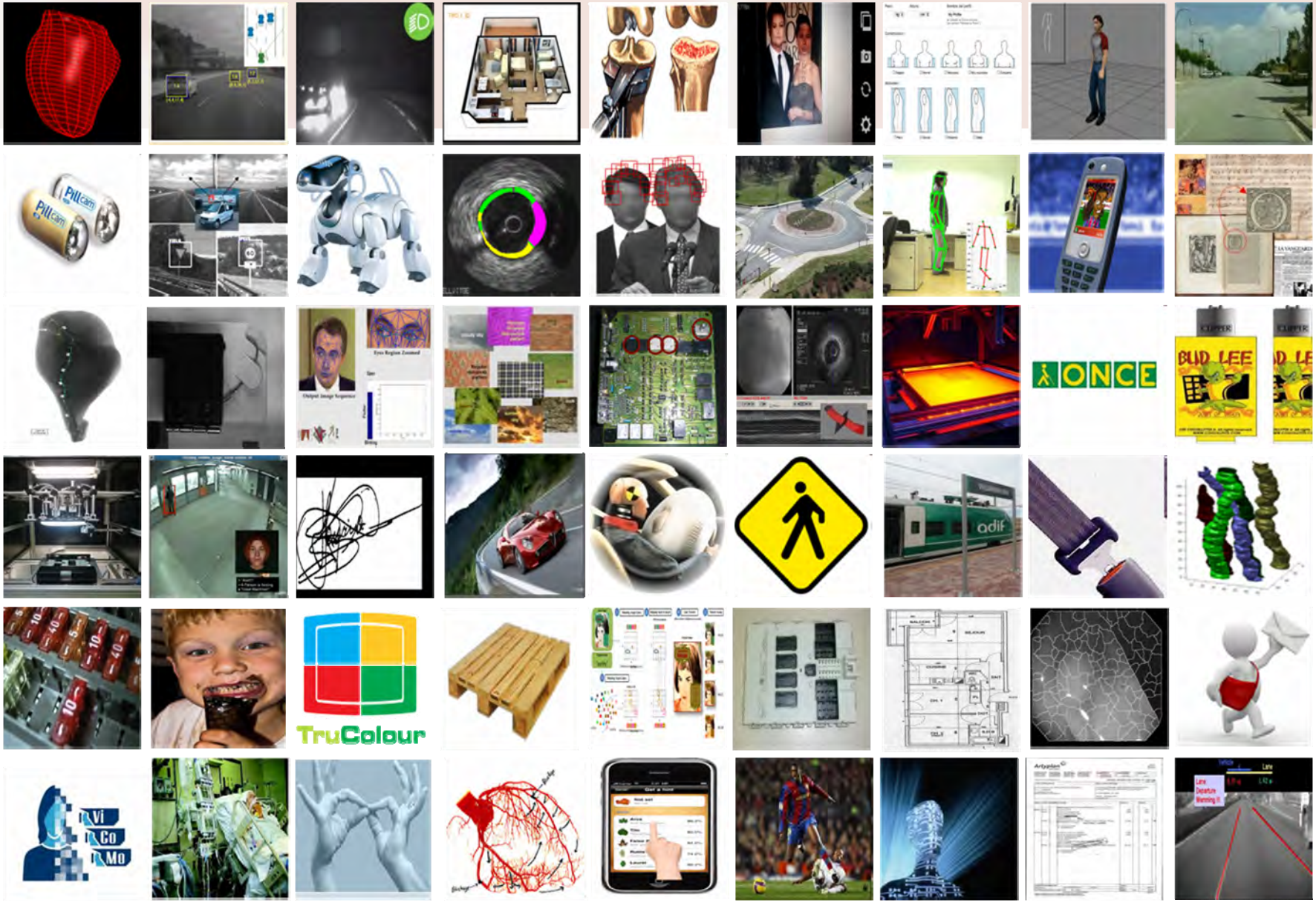


MILab: Medical Imaging Laboratory



IAM: Interactive & augmented modeling




PillCam
ONCE
BUD LEE
adif
TruColour
Vi
Co
Mo

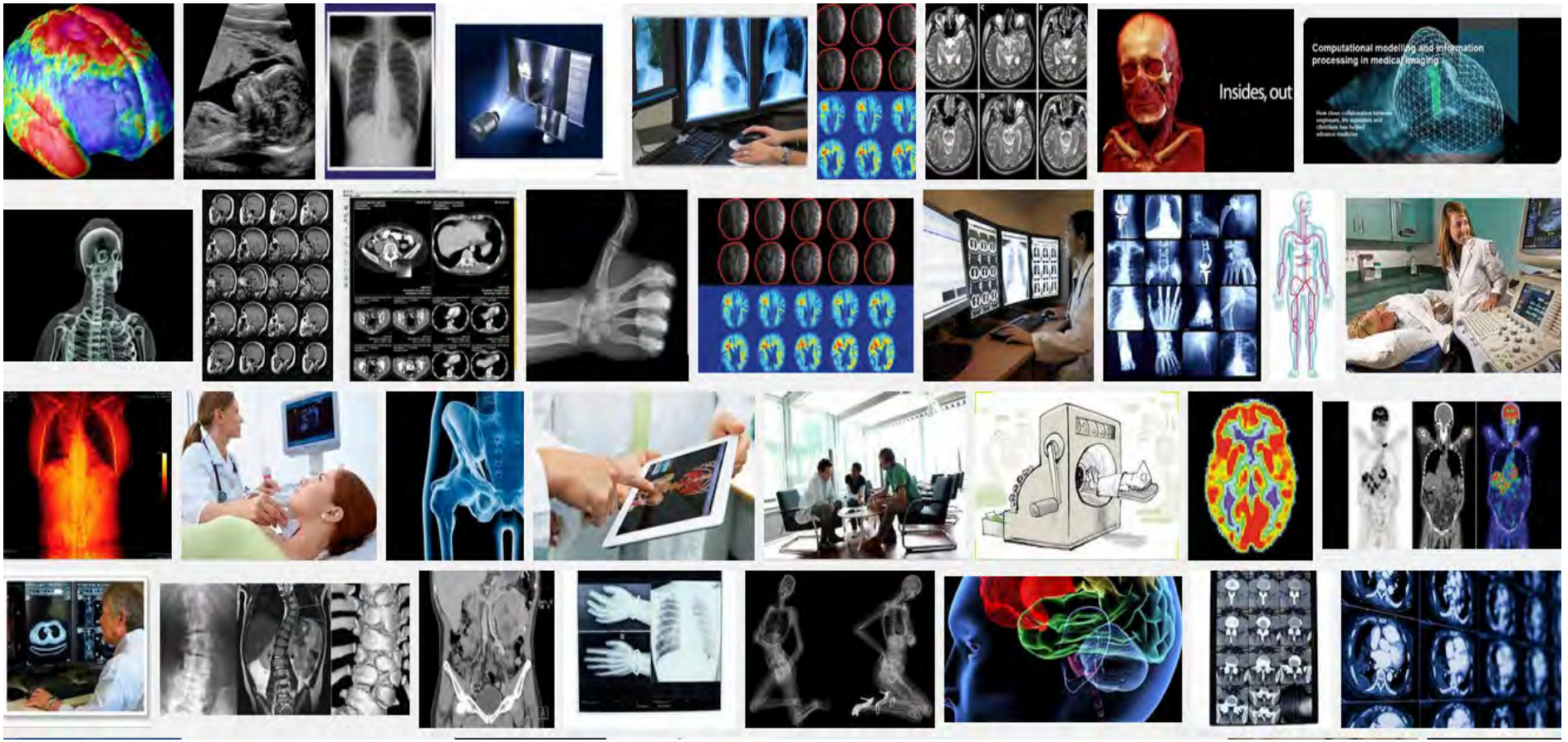
Collaboration with CVC

The CVC has the objective to contribute innovation to companies and society. Our ways to collaborate are:

- **Ad-hoc projects:** Specific and customized projects.
- **Sponsored Research**: Externalized R&D projects under open innovation paradigm.
- **Collaborative projects:** under co-funding of public agencies.
- **Industrial studentship:** Master internships, industrial doctorate.

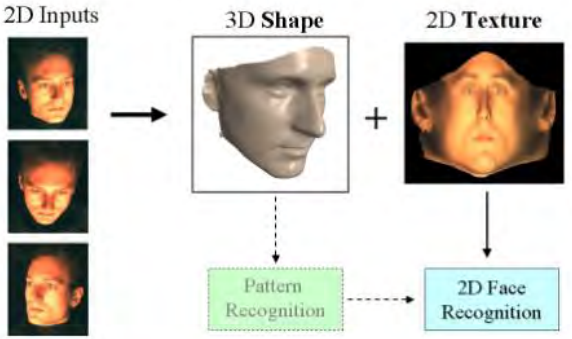
Computer Vision Challenges and Opportunities

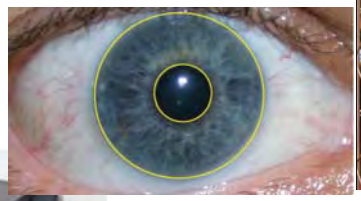
Medical imaging



Security and Surveillance: Biometric descriptors

Fingerprint identification, face recognition, iris and retinal scanning, hand geometrics, ear geometrics, signature recognition, voice identification, DNS identification, human scent, typing characteristics or gait recognition are not the privileges of science fiction any more.





Security and Surveillance

Face Screening

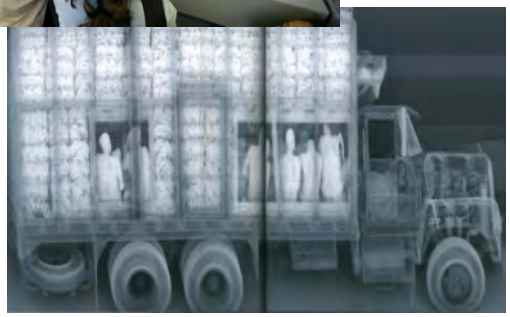
Viisage (L-1 Identity Solutions)

Check point control

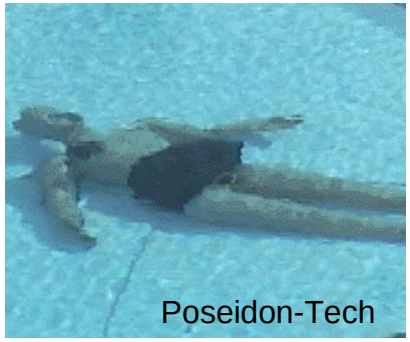
Adaptive Recognition Hungary

US-VISIT

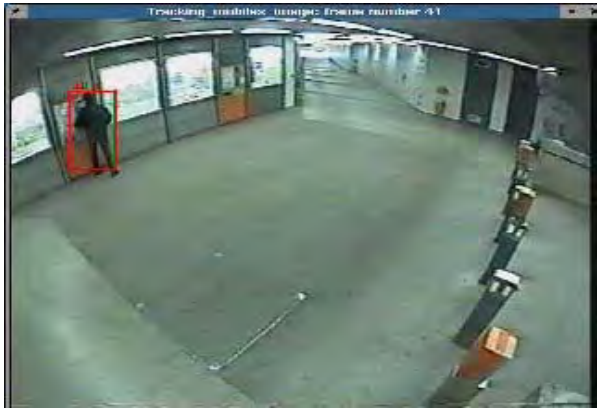
3M



Swim Pool drown



Poseidon-Tech



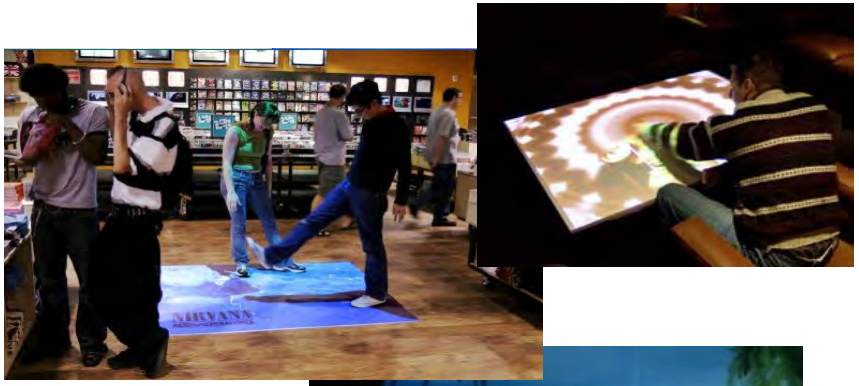
Tracking and Action Detection

> “Alert!!!
> A Person is forcing a Ticket Machine!!”

Media and Entertainment

Gaming interfaces

Sony EyeToy (for PlayStation). Allows players to interact with games using motion, color detection and sound.



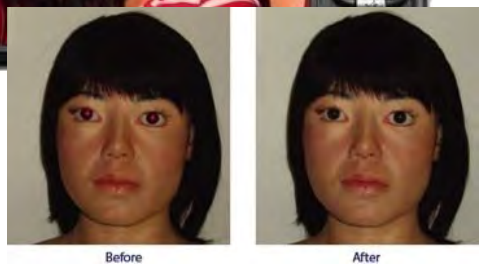
GestureFX. Gesture interfaces in ground, wall or tables.

Augmented Reality

ARmusement

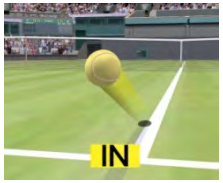
Digital Photography

Photosynth
(Microsoft LiveLabs)

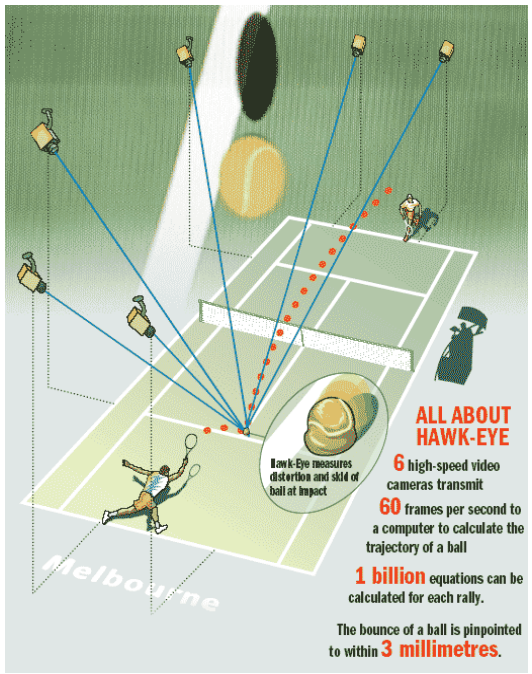


Media and Entertainment

Augmented TV



Hawk Eye: ball tracking in sport games.

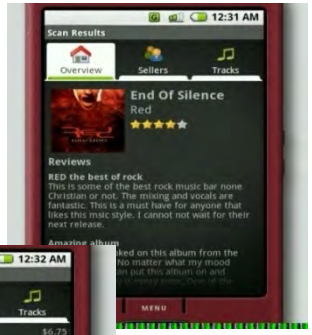


PVI: Virtual advertising in real tv images.

Mobile/embedded Computer Vision

Customer service

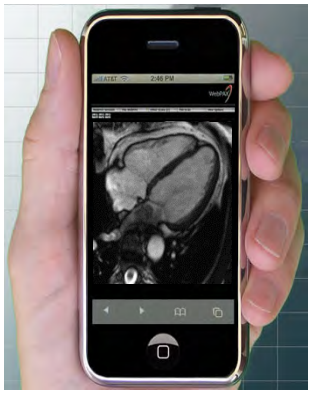
Android Developer Challenge (Google): Barcode reader for price listing and product information



Handicapped

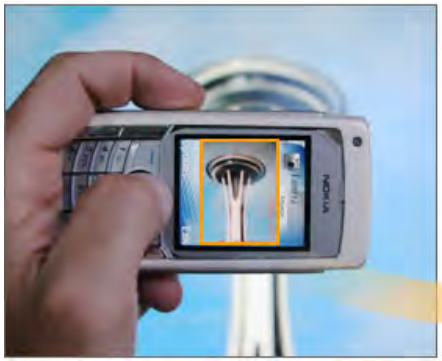
Embedded CV systems for blind people

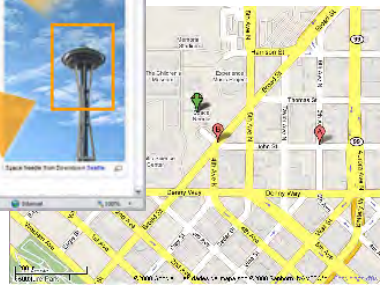
Health services



Medical imaging in i-phone

Tourism



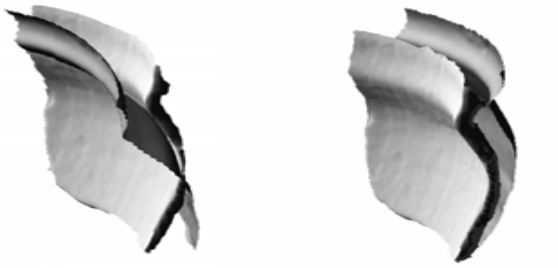


What is that tower called?

Cultural Heritage Preservation

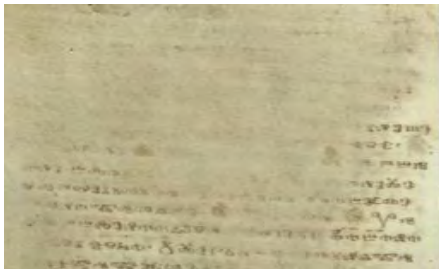
Archeology

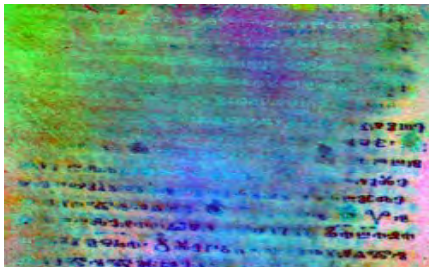
3D pottery reconstruction

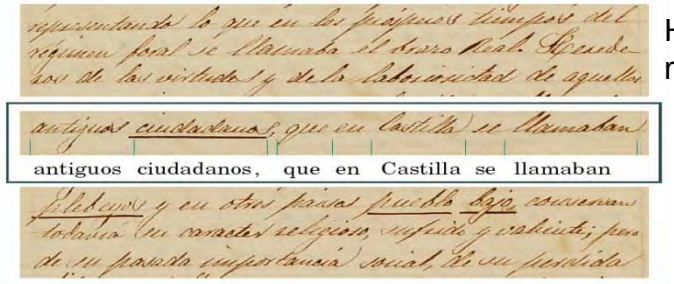


Ancient documents

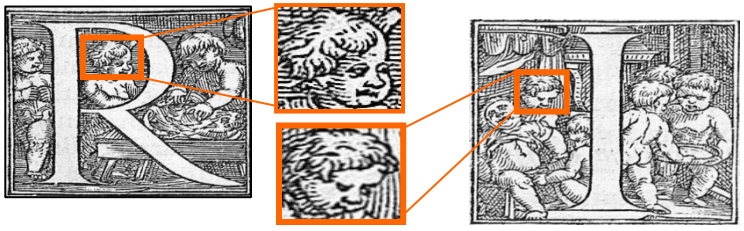
Document restoration







Handwriting recognition



Engraving analysis

THANK YOU