
EDUSAFE PROJECT
IDEASQUARE
O. Beltramello

Who are we ?

A Collaboration of 12 Partners
EDUSAFE FP7 Marie Curie ITN Project

3.2 MEuros, 4 years program (started in Sept. 2012)
CERN / ATLAS is coordinator
10 PhD Fellows
2 Post Doc. Fellows

- Athens University of Economics and Business, Greece
- Canberra, France
- CERN / ATLAS
- EPFL, Switzerland
- Novocaptis, Greece
- IASA / National Technical University Athens, Greece
- Prisma Electronics, Greece
- Technical University of Munich, Germany
- Universita Degli Studi Di Roma Tor Vergata, Italy
- Aristotle University of Thessaloniki, Greece
- CAEN University, France
- Democritus University of Thrace, Greece

What are our goals ?

Assist people working in extreme environment

Our test case: CERN maintenance activities in radioactive environment

We supervise workers, their environment and their activities

- audio / video connection
- environment parameters
- health data

We provide information to worker

- various display: tablets, HMD
- from various nature: working procedures, dose maps
- using Augmented Reality technologies

➔ **increase safety levels**

➔ **reduce human errors**

➔ **decrease intervention time**

➔ **reduce intervention stress**

What is the status of our developments?

The Worker Supervision System is ready

EduPix gamma imaging camera prototype is ready and tested

360° scan, remotely controlled, motorized, light 3 Kg

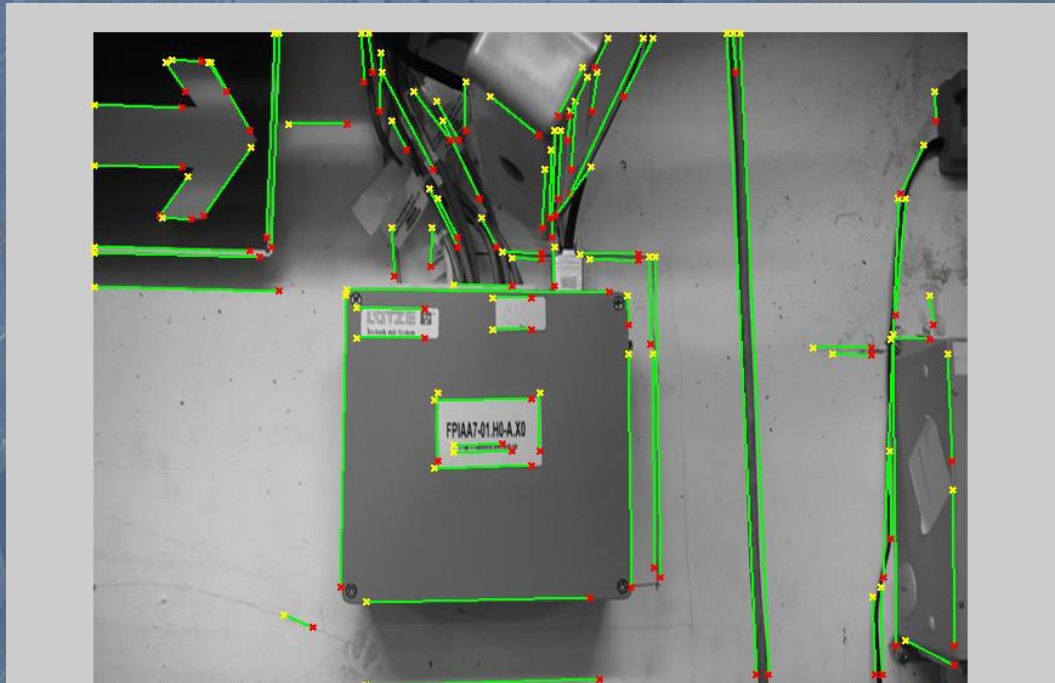
We are able to detect the gamma hot spots in the environment !

Augmented Reality developments are on going and under integration process

✓ Computer vision state of the art algorithms for a (very) fast worker position determination - EPFL

✓ **The WRM, the analogic Weighting Resistor Matrix – Roma II**
Development are on going, and the results are very promising

WRM is directly derived from the CERN high energy physics technology, used in LHC to make pattern recognition at nanosecond level ...
Now to be used to boost Computer Vision algorithms
.. Increase robustness ... Decrease time of computation



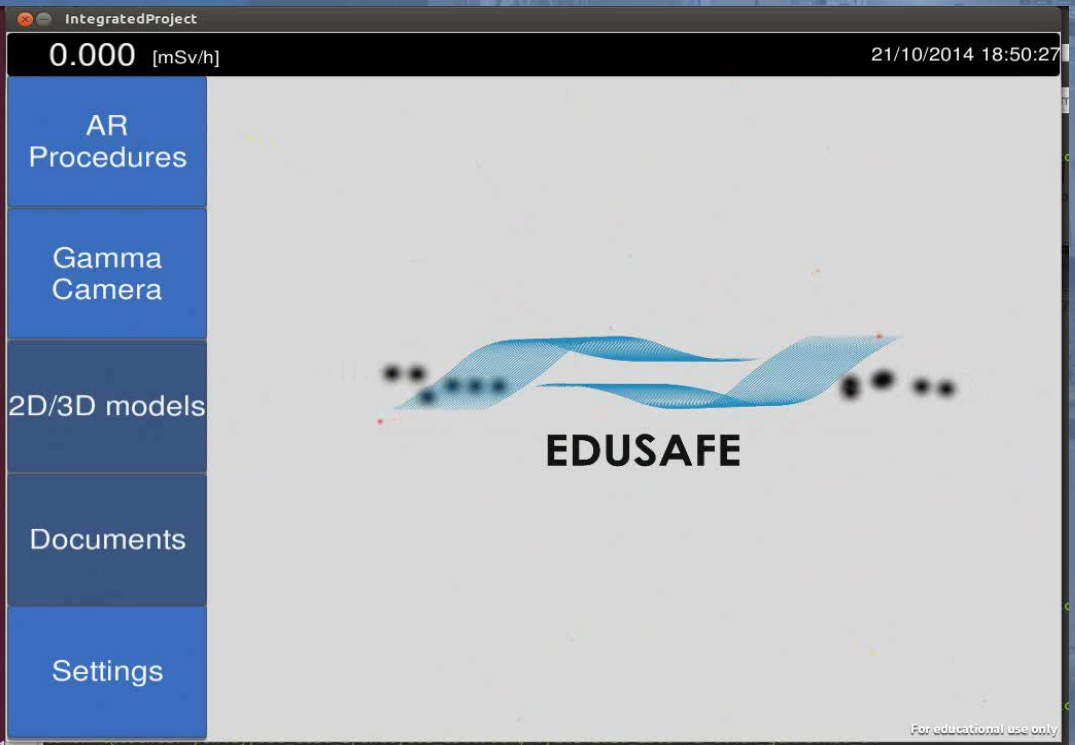
Augmented Reality developments are on going ...

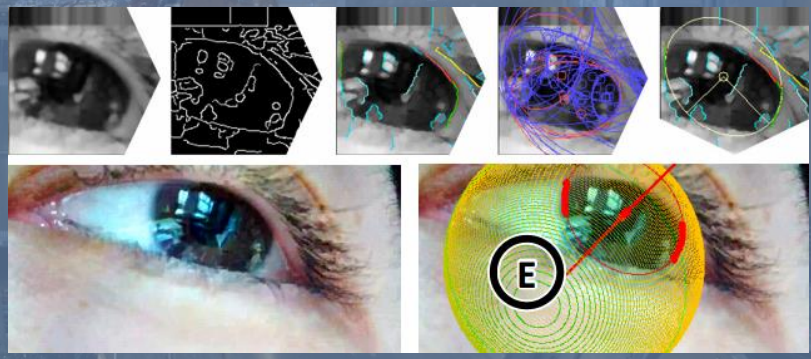
✓ **Sensor Fusion and rendering – CERN and TUM**

We fuse the data coming from image analysis with IMU sensors and provide rendering (procedure information) to the worker

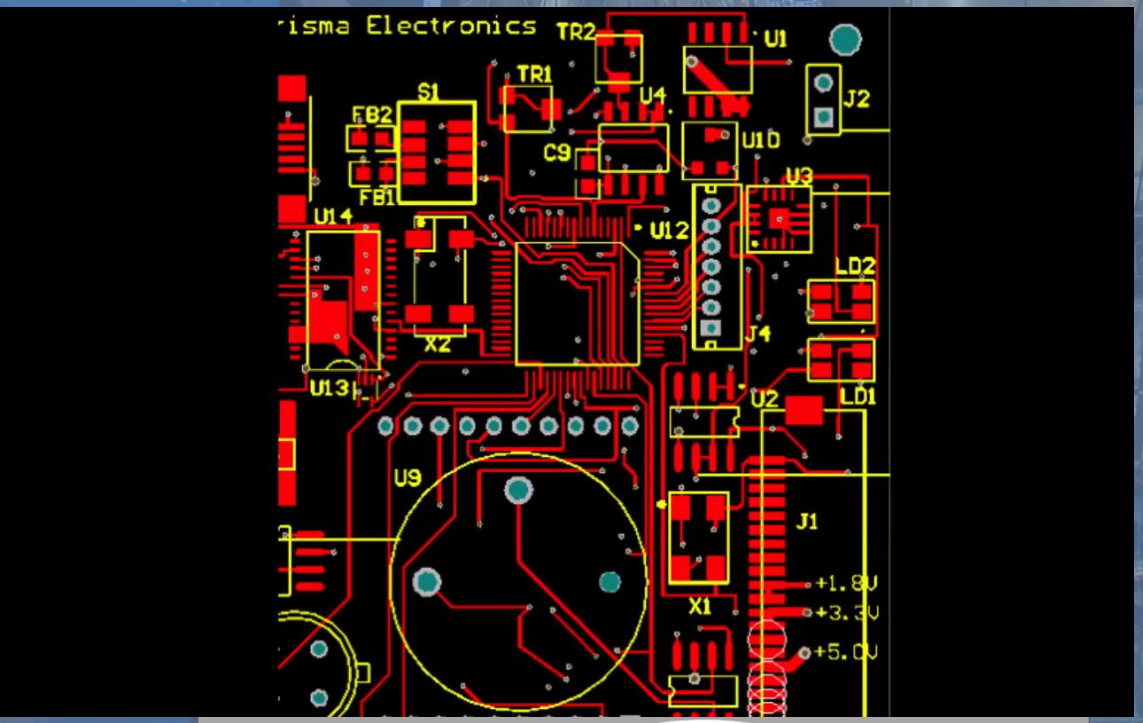
... every 30 ms...

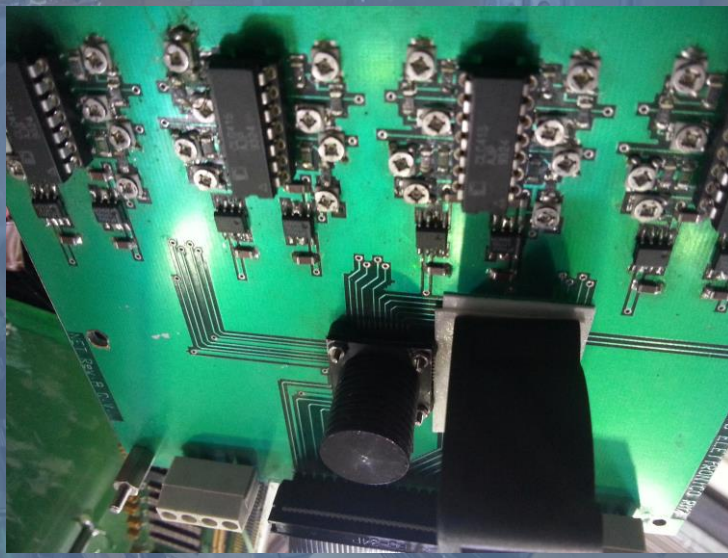
We track the eye and project information at right position

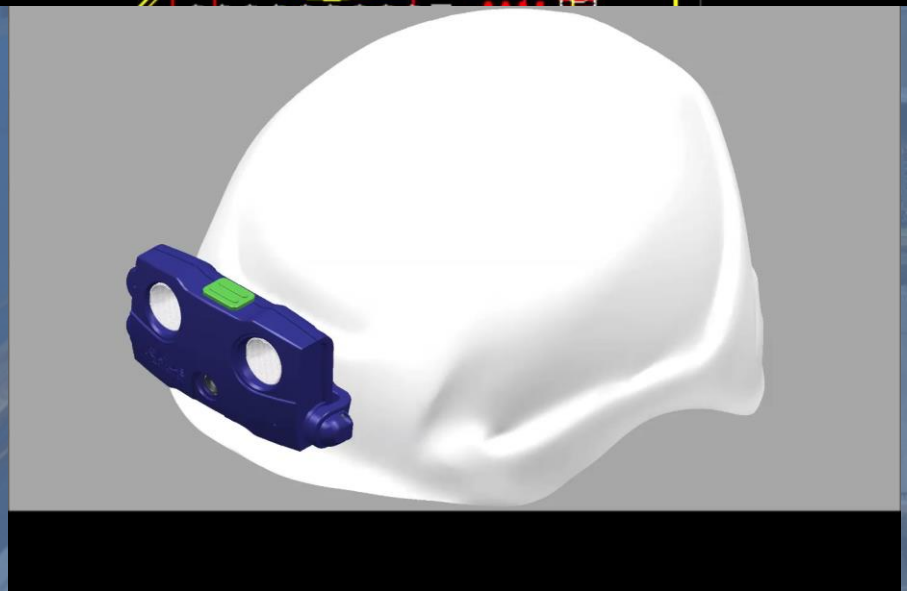




The System Hardware is under construction ...





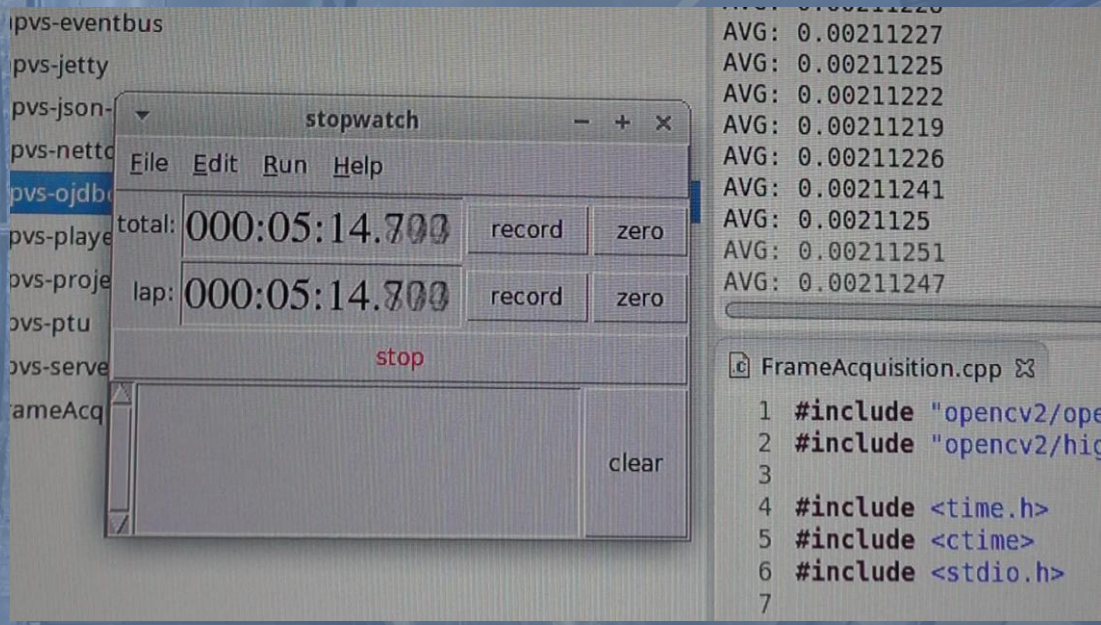


System integration and testing campaign has started ...

We start measuring performance ...

- ✓ **data transfer**
- ✓ **system accuracy and fastness**
- ✓ **ease of use**
- ✓ **ergonomy, etc ...**

The results are up to now better than expected for the first prototype !



We already look for dissimination and future !

One first outreach case :

Technology transfer to assist Autistic Spectrum Disorder children learning !