Università degli Studi di Firenze
Facoltà di Ingegneria
CVG - Computational Vision Group

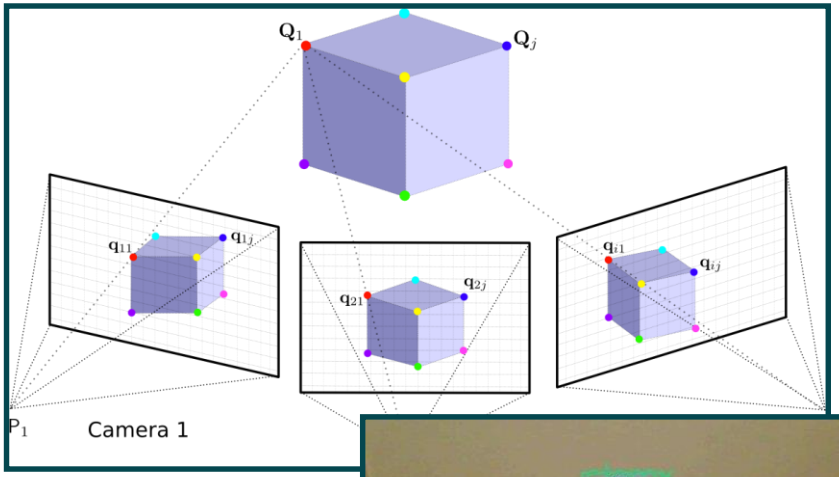
Two Research Projects on Computer Vision for the Visually Imparied

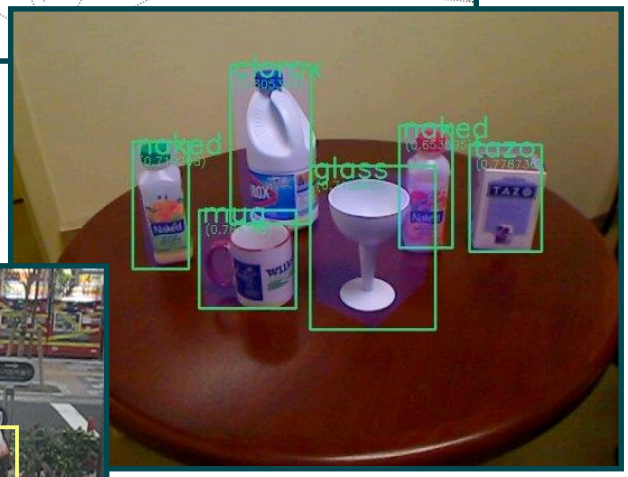
C. Guida – M. Fanfani – C. Colombo

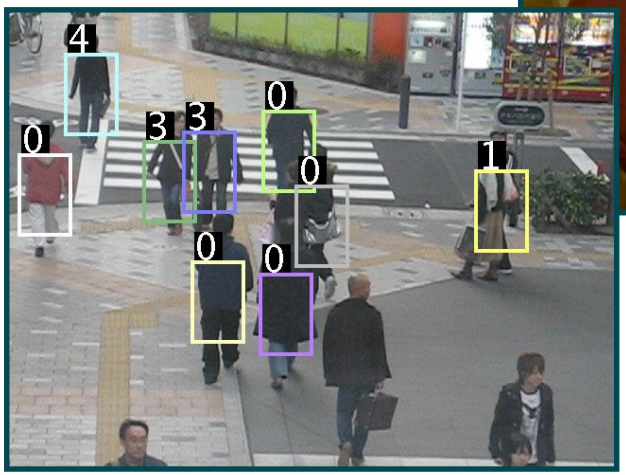
Andrea Bocelli Fundation
Pisa
06.06.2012

Computer Vision

- Computer Vision is the science of analyzing images or videos coming from cameras
- Main application:
  - 3D Reconstruction
  - Image-based Recognition
  - Visual Tracking
  - …

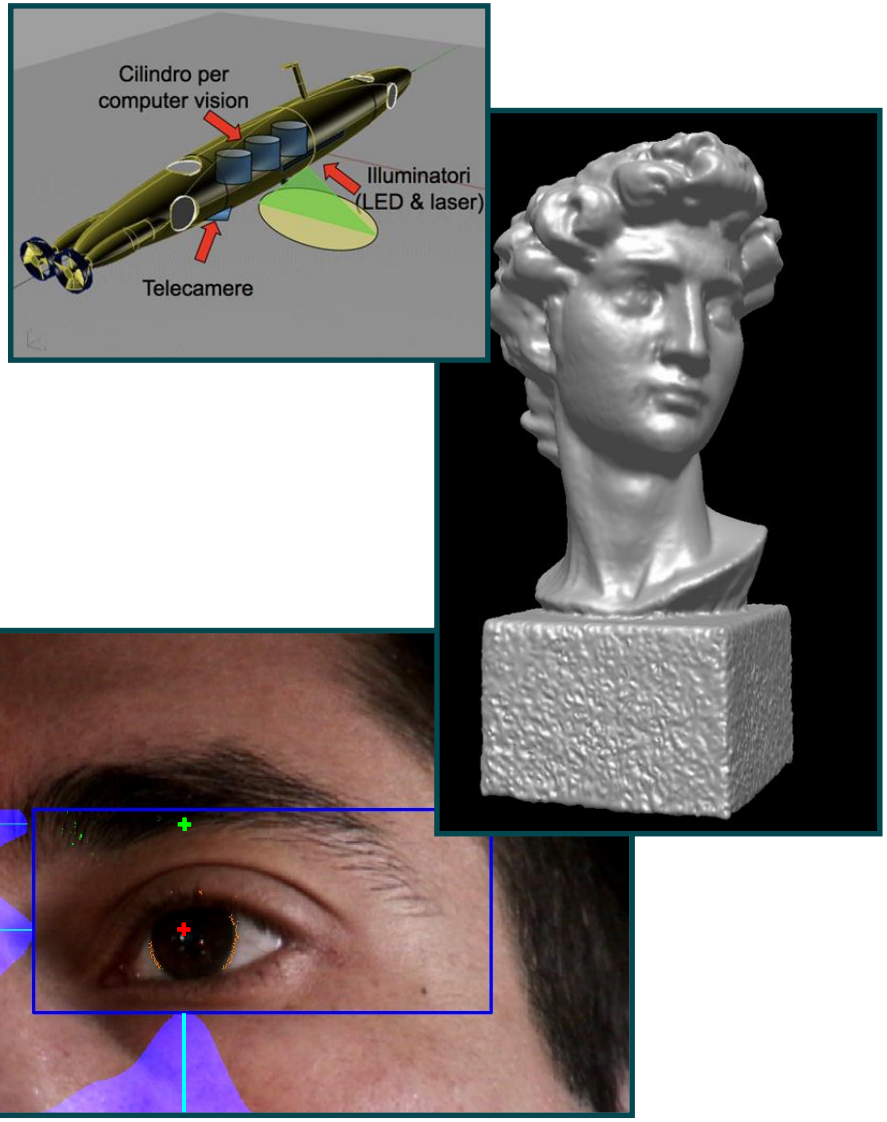






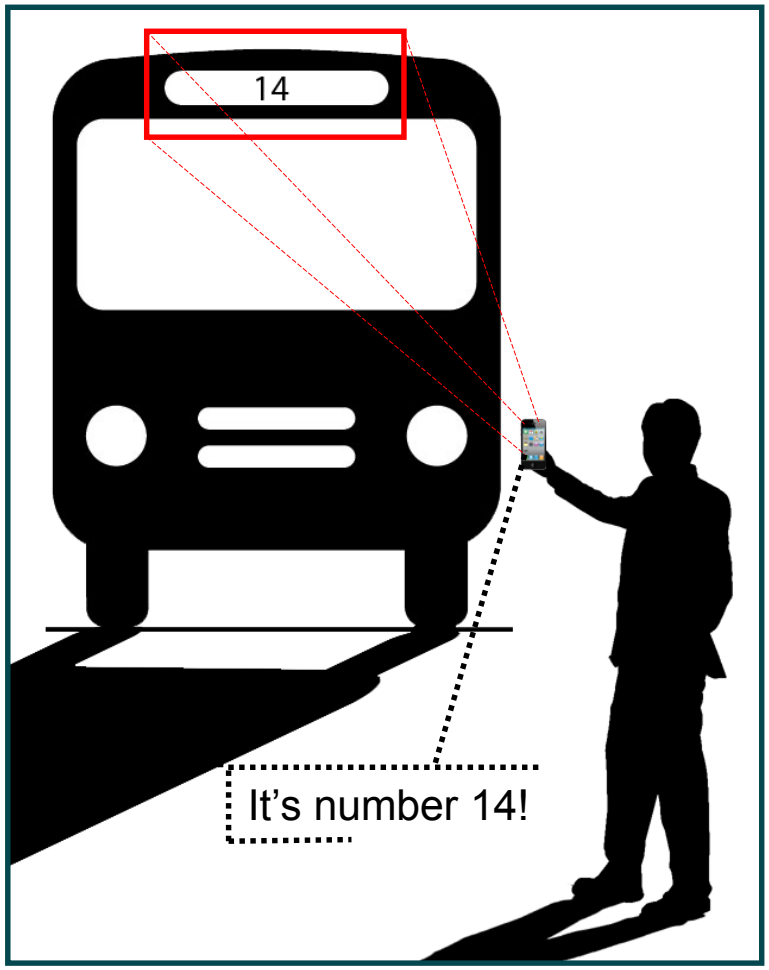
Computational Vision Group

- CVG is a research group at University of Florence specialized in computational vision.
- CVG is currently working on:
  - Underwater 3D rec.
  - Photometric and fine 3D rec.
  - Visual learning and recog.
- Special attention is always placed in solving social problems:
  - EyeMouse
  - Tools for blind people



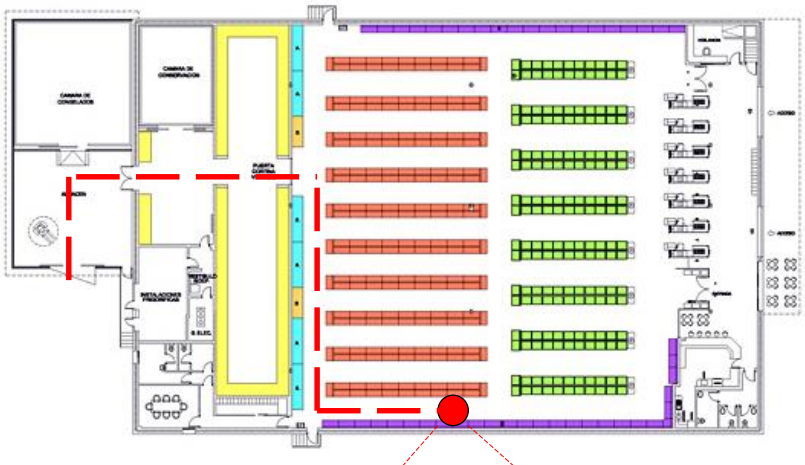
BUS ALARM

- One of our major result in serving blind people
- iOS App
- Capable of localizing and recognize the bus line number
- Operate in real-time



VISITOR - Idea

- VISITOR is a live sighted-guide-assistant
- Exploration based on annotated 3D maps
- Localization of users's mobile phone though CV
- Other feature:
  - mobile app
  - obstacle avoidance
  - visual learning
  - navigation algorithms
  - objects recognition



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VISITOR – Phase 1

- Bibliographic research
- Data acquisition
- Map building
- Classifier training for specific object recognition

VISITOR – Work Package 2

- Development of localization and navigation algorithms exploiting the pre-built maps.
- Contextualization:
  - localization combined with object recognition
  - output: annotated 3D maps
- First test session

VISITOR – Work Package 3

- Mobile App development
- GUI design for low-sighted and totally blind users
- System expantion adding more 3D maps.
- Final test session.

Conclusion

- Because a place like shops and markets have not a steady structure configuration, VISITOR should be able to recognize variations not only in the structural part of the map, but also in the annotated part, i.e. fruits is moved somewhere else from last visit.
- Verification of maps coherence and their updates are central in developing a reliable application

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