UNIVERSITÀ
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Computer Vision and Multimedia Laboratory

Current Activities (*A.Y. 2022/23*)

Department of Electrical, Computer and Biomedical Engineering
University of Pavia

Introduction

- Active since the early 70s, the first research activities of the group focused on ***image enhancement*** and ***restoration***

- The research topics were later extended to include ***parallel architectures for vision,*** advanced techniques for ***image and video processing,*** as well as the more recent innovations in ***machine and deep learning***

- Currently, the main research areas of the laboratory include:
  - ***Computer Vision***
  - ***Digital Humanities***
  - ***Eye Tracking***
  - ***Human-Computer Interaction***
  - ***3D modeling***

Staff members and courses

STAFF

- Professor emeritus: *Virginio Cantoni*
- Full professor: *Marco Porta*
- Associate professor: *Luca Lombardi* (director)
- Assistant professors: *Piercarlo Dondi*, *Mauro Mosconi*, *Mirto Musci*
- Adjunct professors: *Roberto Marmo*, *Marco Piastra*
- Technician: *Alessandra Setti*

COURSES

Bachelor's Degree

- Algorithms and Data Structures
- Digital Media
- Informatica
- Sistemi Operativi
- Web Design and Technologies

Master's degree (ciclo unico)

- Sistemi di Elaborazione delle Informazioni

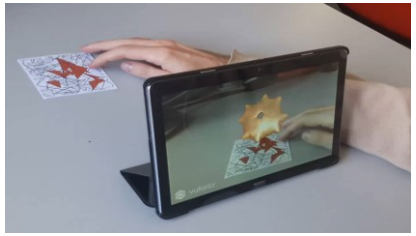
Master's Degree

- Artificial Intelligence
- Computer Vision
- Deep Learning
- Human-Computer Interaction
- Parallel Programming
- Persuasive Design
- Tecnologie Digitali per la Comunicazione
- Web and Multimedia Technologies

Recent research projects

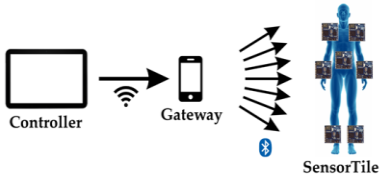
Gestural Interaction

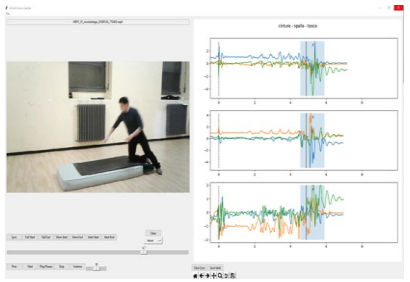
Augmented Reality



3D Modelling

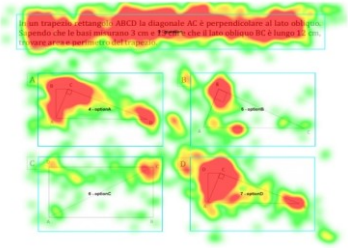
Fall Detection with RNN

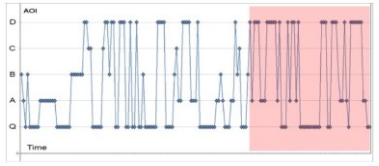




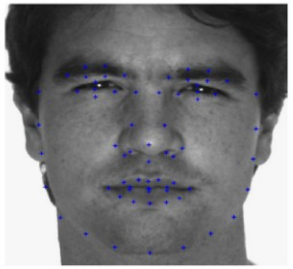
Study of Gaze Behavior

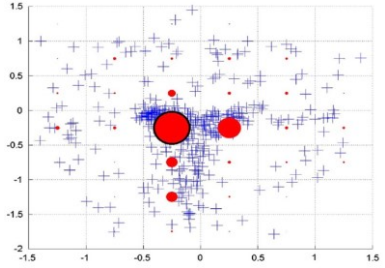
E-Learning



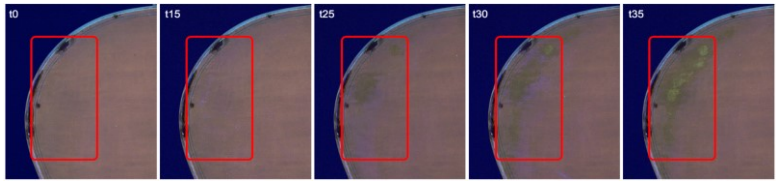


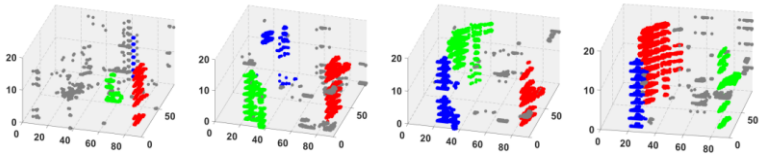
Gaze-based Soft Biometrics





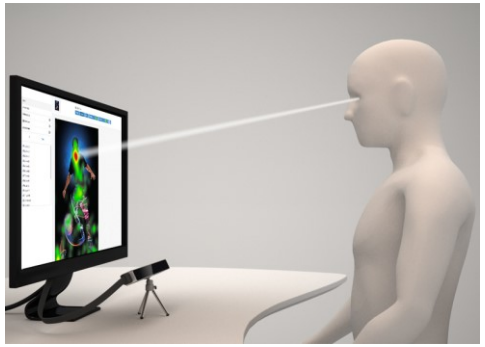
Preventive Conservation

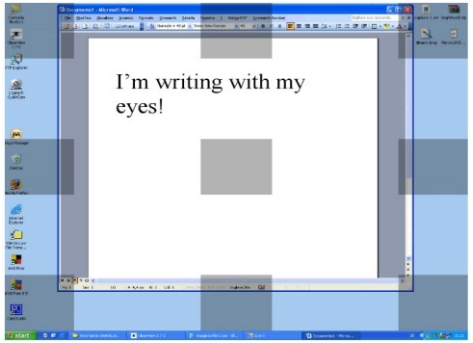


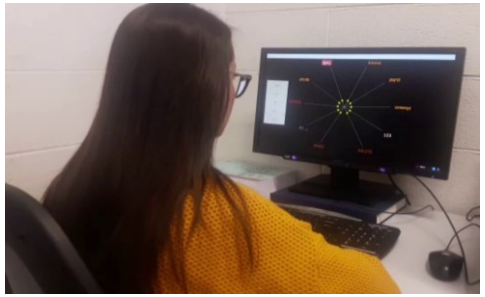


Eye Tracking applications

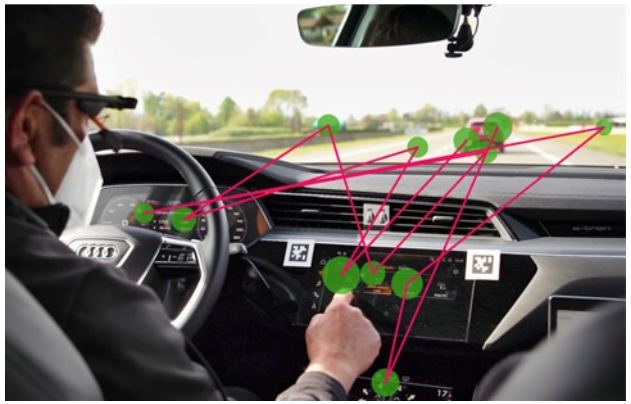
Gaze Input







Automotive



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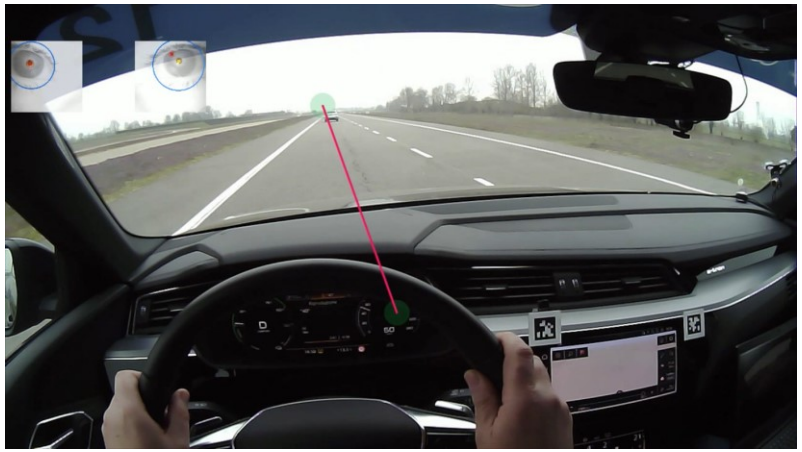
automotive safety centre



Proposed lab activities:

1. Using eye tracking as an assistive technology or as an additional input channel (e.g., to write, surf the web, play music, etc.)
2. Studying the driver's performance using wearable devices

Reconstruction of damaged frescoes

Fragmentation simulation

Proposed lab activities:

1. Extension of the DAFNE dataset (a large collection of hundreds of thousands of images of fresco fragments artificially generated) implementing new type of fragmentation and alterations
2. Development of algorithms for image reconstruction from fragments

Fresco reconstruction

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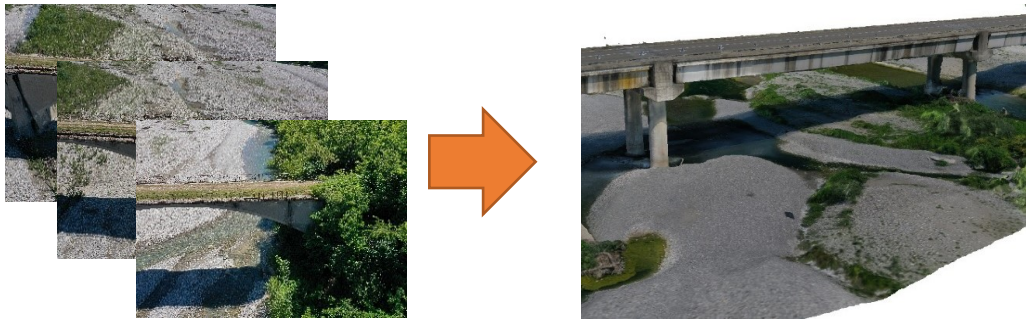
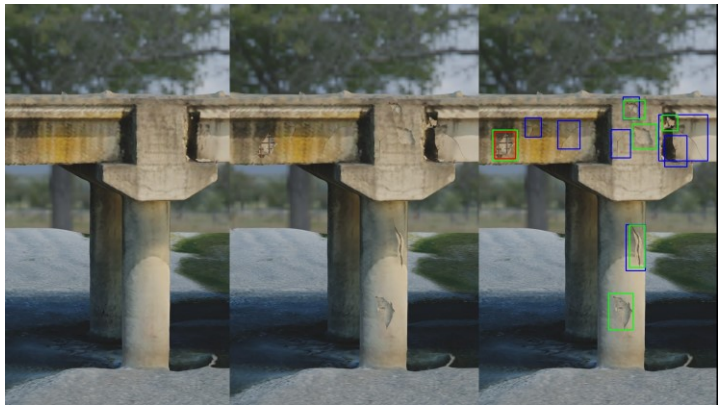
UNIVERSITÀ DEGLI STUDI DI SALERNO

Structural damage detection on buildings and infrastructures

3D model obtained from photos acquired by drone

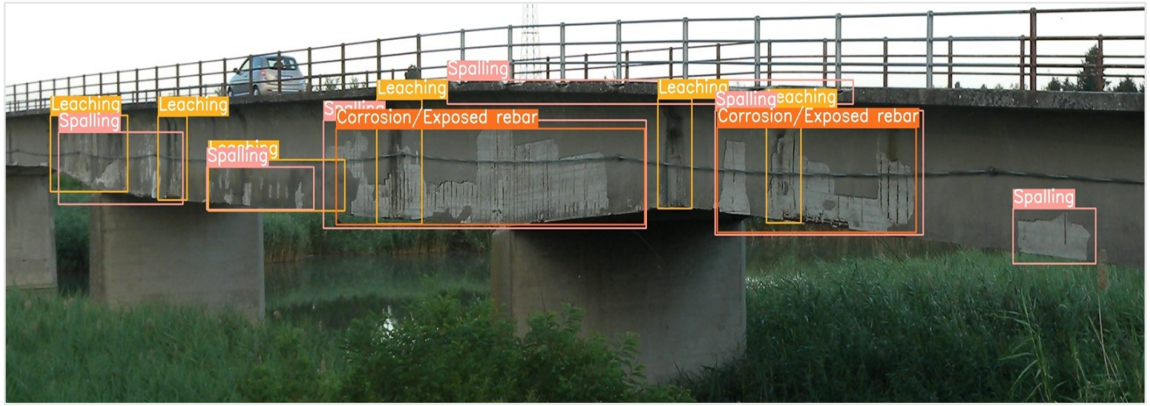


Creation of a semi-synthetic dataset of damages to train a neural network



3D model elaboration and damage simulation

Detection of damaged areas on real images/videos acquired post-earthquake



Proposed lab activities:

1. 3D model elaboration for the creation of the semi-synthetic dataset
2. Damage detection using deep neural network architectures (e.g., YOLO)
3. Bounding box tracking in a video sequence to filter the results of the detection

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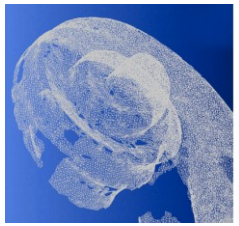
Collaborations



Laboratorio Arvedi di Diagnostica non Invasiva

Museo del Violino

université PARIS-SACLAY

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SORINTTEK

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