

## RecorDIM TG 15 :

### Survey of architecture and cultural heritage by Photo-tacheometry

#### Recording and Visualization of Architectural Sites

#### Hardware

- Good digital camera.
  - Total station (not necessarily motorized).
  - Notebook.
- (in near future totalstations with build-in cameras will be available as standard:  
IATS = Image Assisted Total Station;  
this will again enlarge the field of photo-tacheometry.



#### Software

- TopVRML (Topographic VRML)
- TOTAL (Tacheometric objectoriented parTly automatic Lasersurvey (for motorized totalstations))



IATS

#### How phototacheometry works

- Tacheometric orientation of images taken on site
  - Tacheometric modelling of (regular) object surfaces
- } Coordinates from intersection between image-ray and defined shape
- Object geometry and photorealistic model very fast, on site controlled concerning correctness and completeness.

# **1. State of photo-tacheometry**

## **1.1. Different Methods**

- a) Technique with traditional reflectorless measuring total station: points defining a regular surface, intersection with directions given from images.
- b) Work with motorized total station has additional advantages:
  - automatic control.
  - nobody directing the total station, no direct aiming: fast flowing.
  - measuring geometry using tools of „intelligent tacheometry“ (i.e. recording corners, profiles).
- c) Image texture as an add-on to 3D models:
  - On-line.
  - Off-line.

## **1.2 Software:**

Program of Valencia: TopVRML (Topographic VRML).

Program of Bochum: TOTAL (Tacheometric objectoriented partly automatic Lasersurvey).

## 1.3 Practical experiences:

- Visualization at Polytechnic University of Valencia

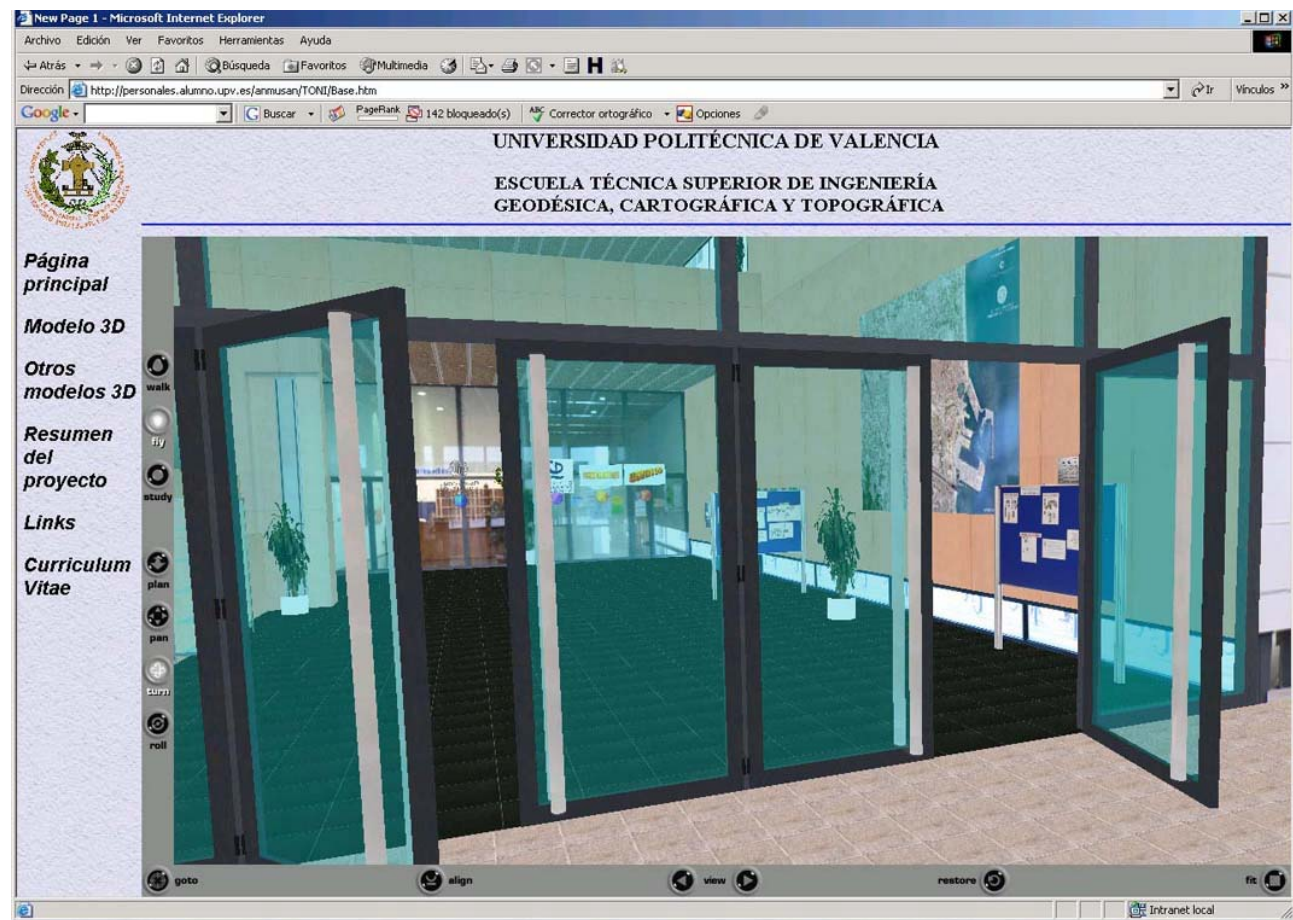
From wireframe models to photomodels:



## 1.3 Practical experiences:

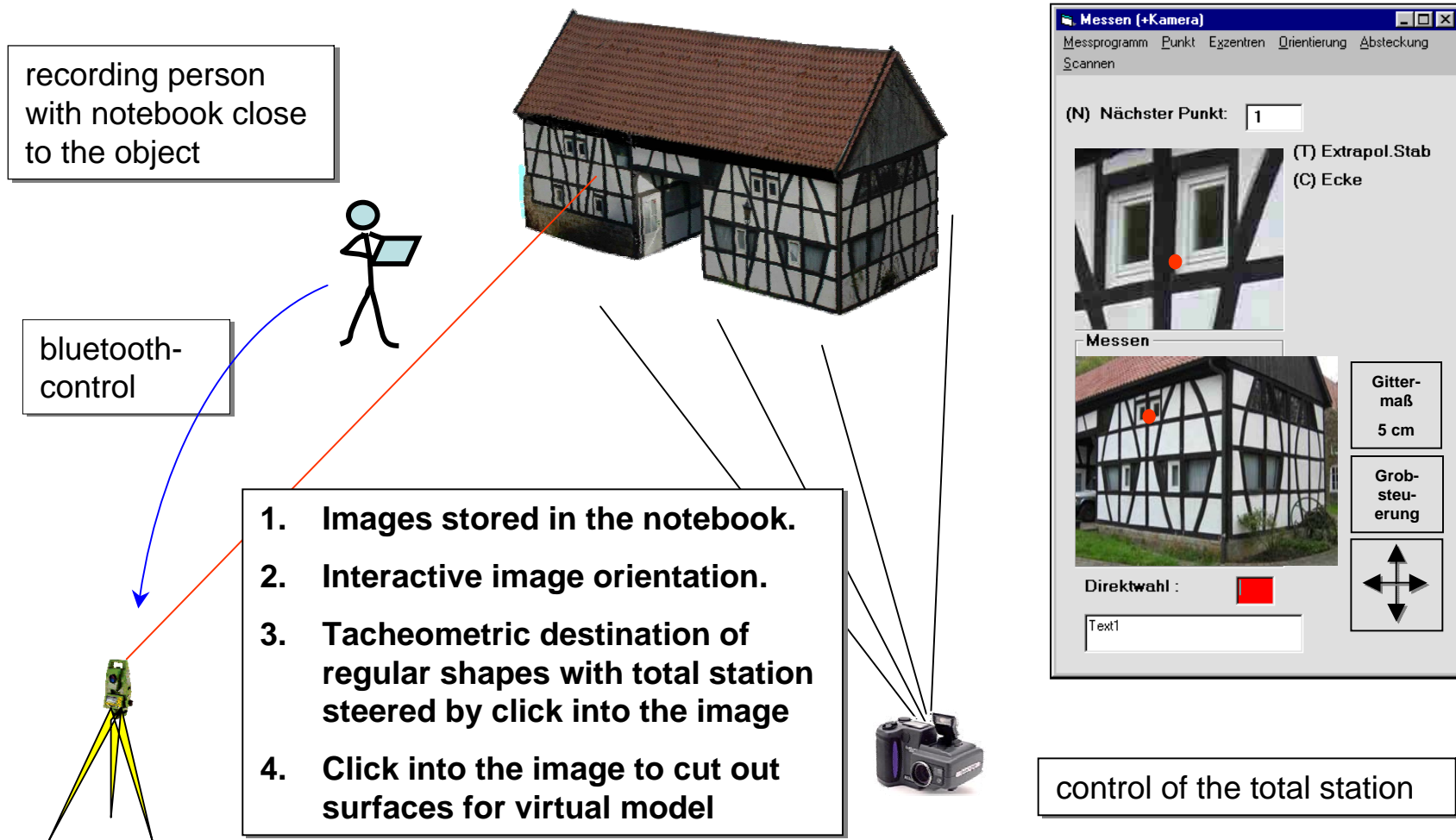
- Visualization at Polytechnic University of Valencia

Indoor photomodels:





Example for **automation** of different tasks in the program **PHOTON** at Bochum (see 1.1. b.); All functions are exclusively steered by click into the oriented image

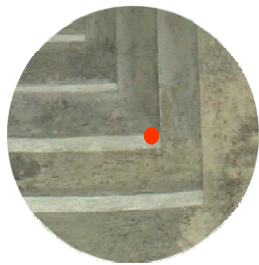


## 2. Recent developments

- 2.1 Technique: Program PHOTON (PHOtogrammetric-Tacheometric-ONsite -recording) using:
- a) conventional total station.
  - b) motorized total station.
  - c) IATS = Image Assisted Total Station.

Visualization with AutoCAD and VRML.

- 2.2 Practical experiments concerning recording on site,  
investigations to separate recording and domestic works
- 2.3. Integration of object-recognition towards automation



i.e. automated aiming by  
extraction of characteristics



### **3. Planned praxis-events**

#### **3.1 Joint surveys**

Seeking for interested museums/art galleries.

Exchange of experience Bochum-Valencia in a joint project.

#### **3.2 Seminar for external users**

phototacheometry as a new method between laserscanning and traditional methods

spring 2007

### **4. Extract: Photo-tacheometry-manual on the RecorDIM- website**

### **5. Seeking help**