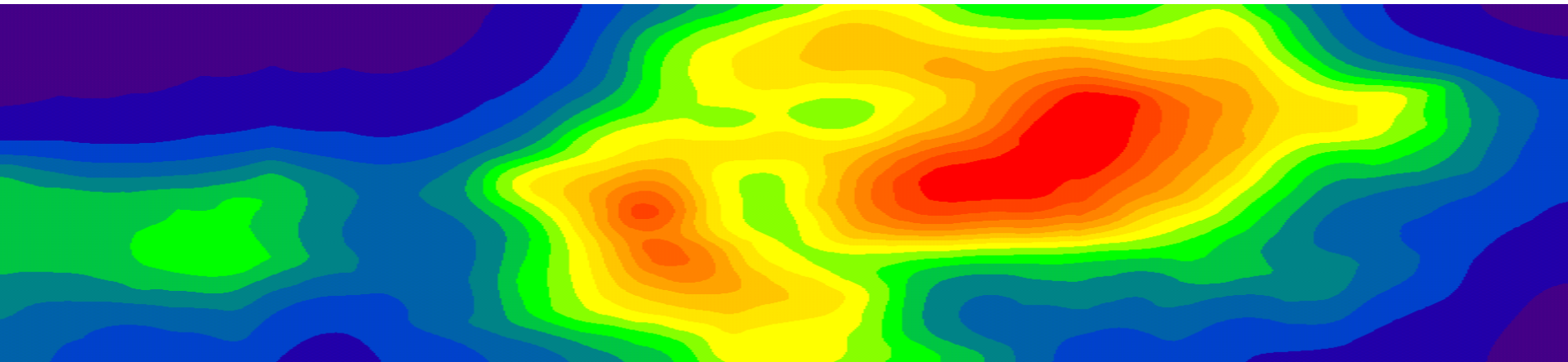


 **FORUM 8**

Visualization of



Environmental Parameters over Time

Research Collaboration:
Prof. Paolo Fiamma, Pisa, Italy

Research Goals:

Research Goals:



Reveal **invisible thermal** environmental properties

Research Goals:



Reveal **invisible thermal** environmental properties



Using a low-cost add-on **thermal camera** to create **VR texture-maps** of building façades

Capturing+ displaying a **thermal time-lapse** on building façades and their surroundings

visualizing common environmental materials with their thermal properties, and their effect on the “**Urban Heat Island**”

Tools & Technology

Hardware and Software



> Thermal Camera -Flir ONE

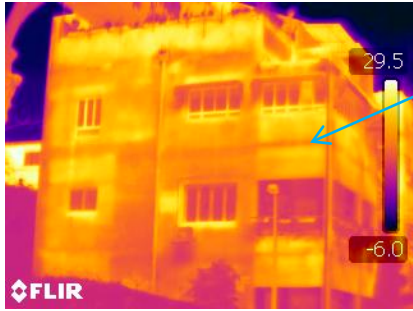


FLIR One - for Mobile Phone/ tablet

Image resolution: 160 x 120 pixels

Past projects 2014-2017
With FlirONE thermal Camera

Initial Research 2014 Project Proposal



Exposure of a "thermal bridge" from the concrete structure



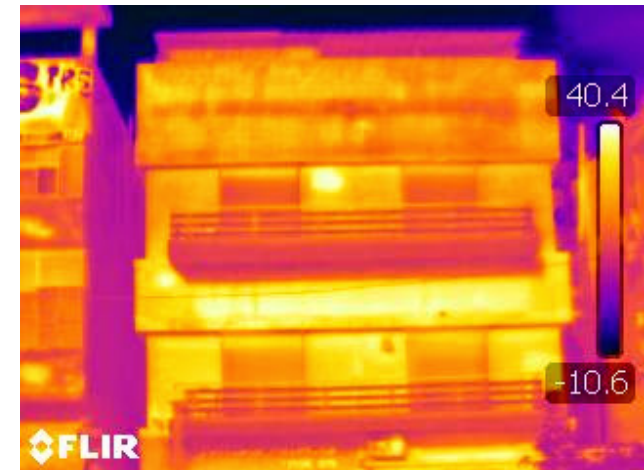
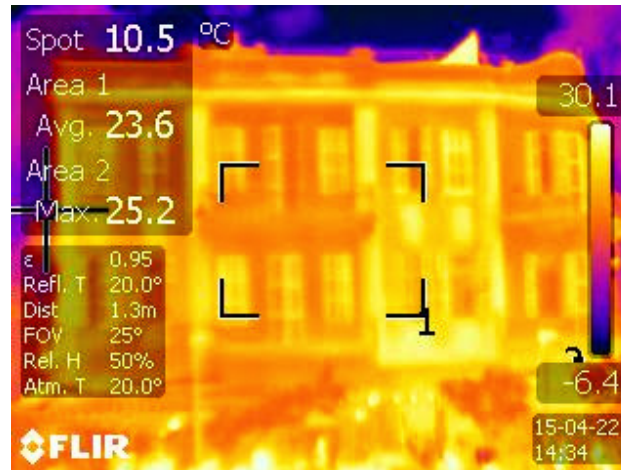
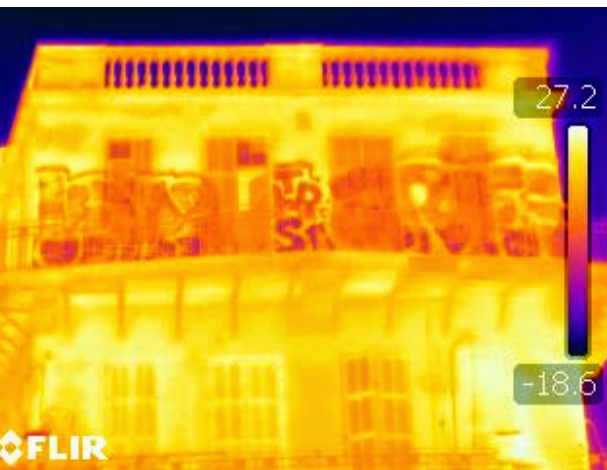
Thermal photography
of residential building
facades and a proposal
for public projection

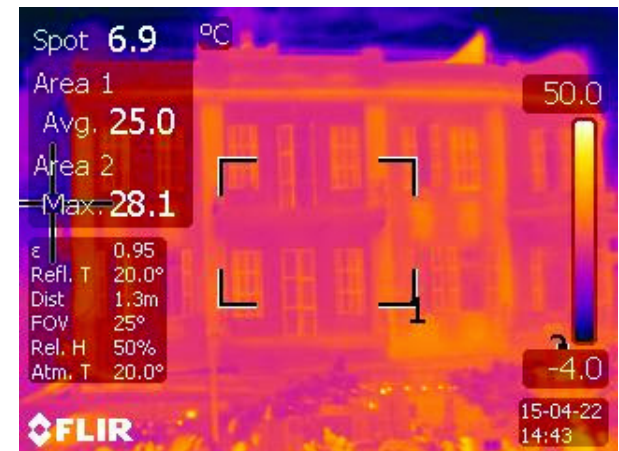
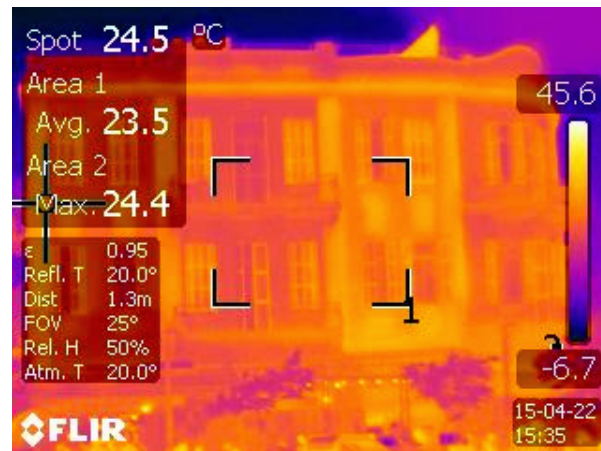
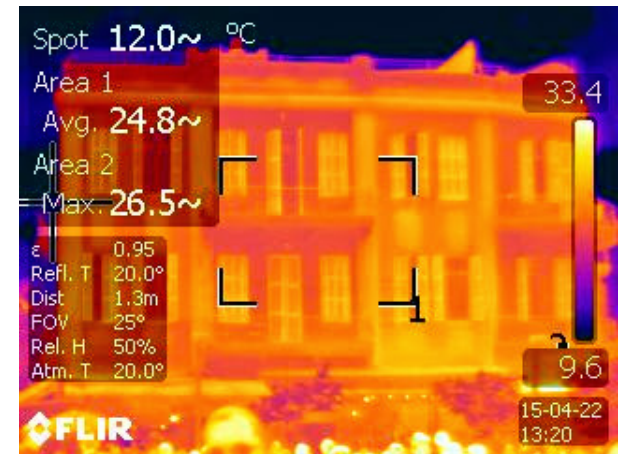


UC-Win/Road Project



> Thermal "time-lapse" of an urban square (*Case study 1*: Tel Aviv, Israel 2014)
<https://vimeo.com/126803301>



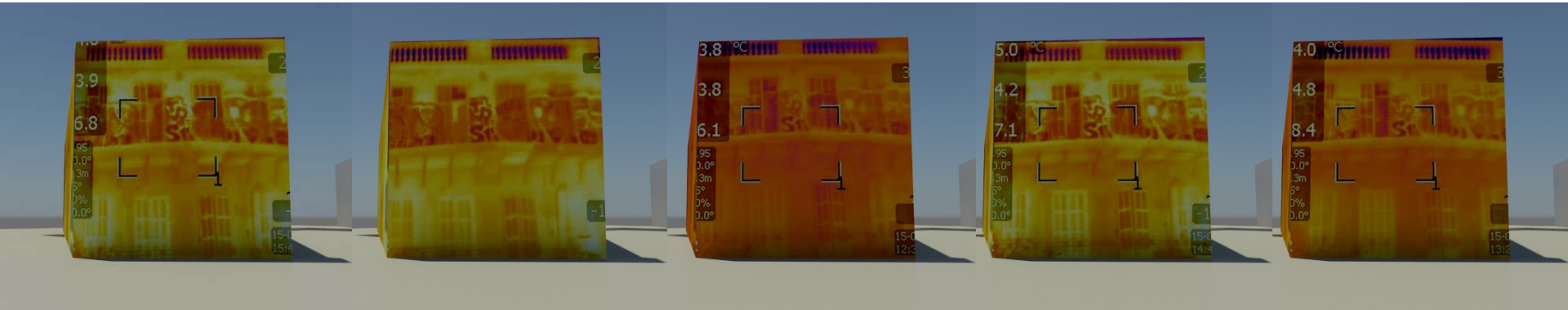




UC-Win/Road Project



> Thermal “time-lapse” of an urban square (Case study 1: Tel Aviv, Israel 2014)



Problems:

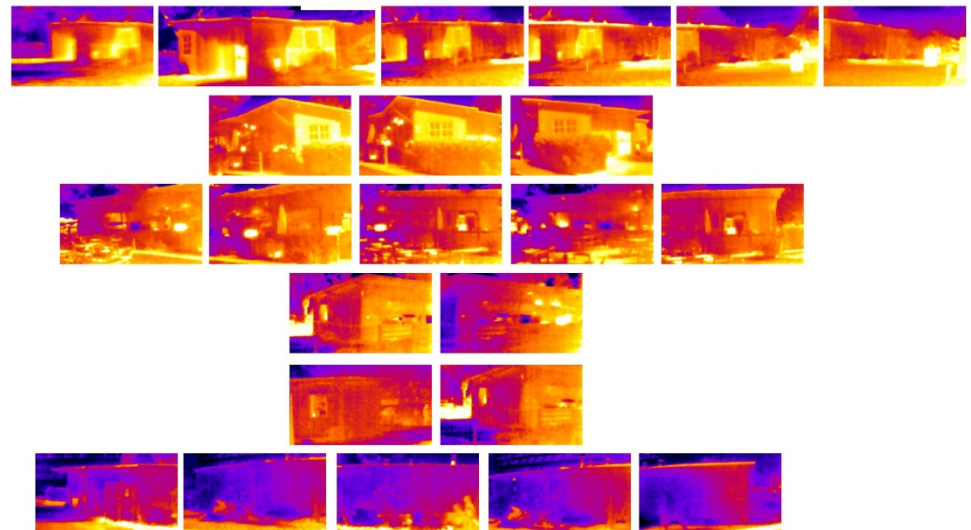
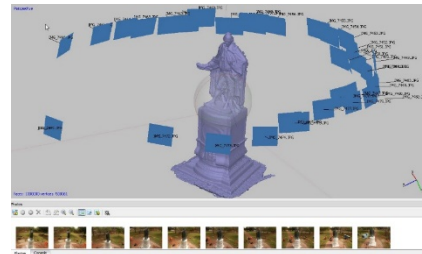
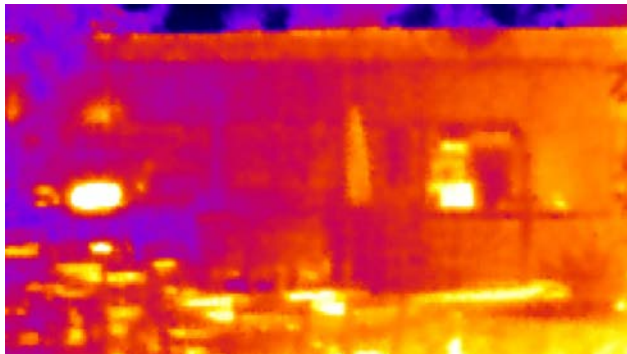
> Change of temperature **range**
in each photo



UC-Win/Road

Project- Thessaloniki workshop 2015

SEEK - capturing a small building



Test:

trying to generate

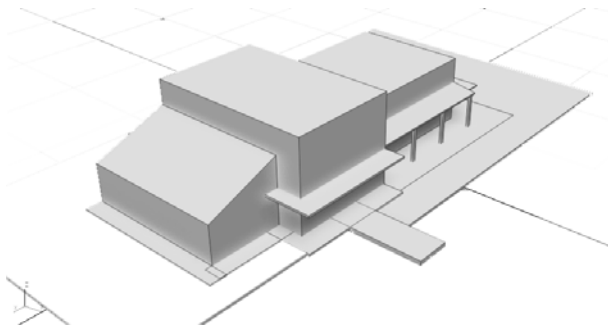
3D model + texture maps

from thermal imaging

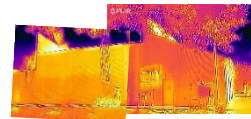
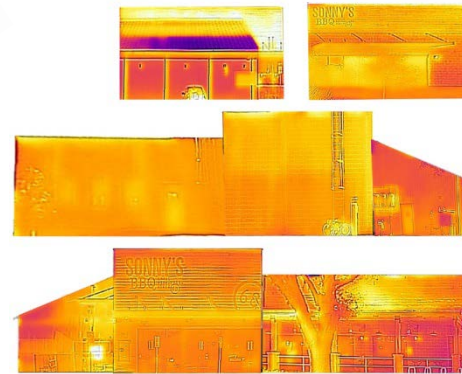


UC-Win/Road

Project- University of Florida workshop 2015 - capturing a **small building**



Modeling Process:



Problems:
Can't tile façade images
Can't set "thermal range"



FLIR One - for Mobile Phone

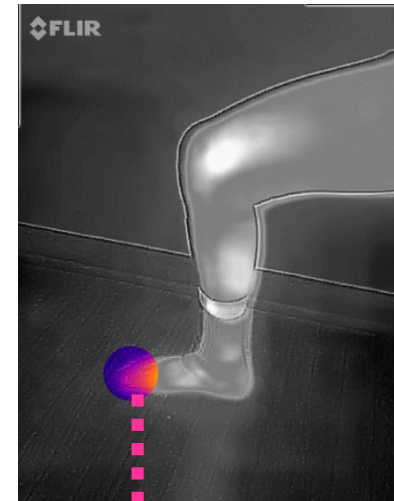
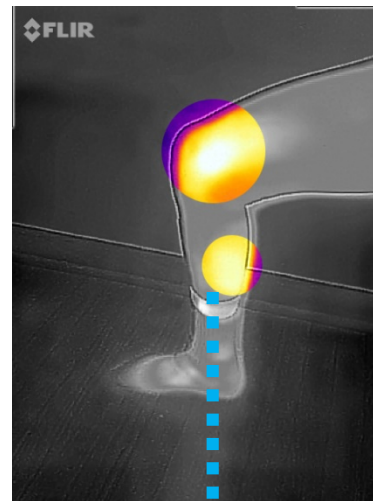
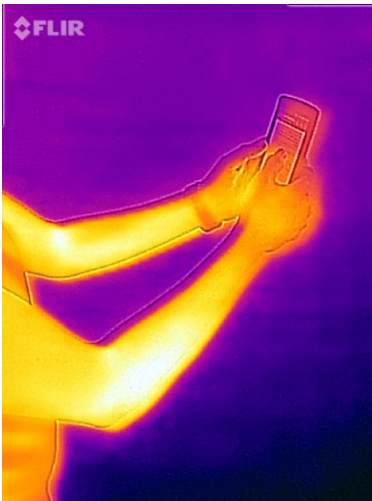
Image resolution: 160 x 120 pixels



SITTING POSTURE ANALYSIS

FLIR One - for Mobile Phone

Image resolution: 160 x 120 pixels



2- HARDWARE

Early tests showing heated areas of muscles and joints

And cooler body part , may suggest poor blood circulation



SITTING POSTURE ANALYSIS
THERMAL PHOTOGRAPHY



Examples of thermal imaging test for body posture

3 - DATA COLLECTION: BODY POSTURE PHOTOGRAPHY

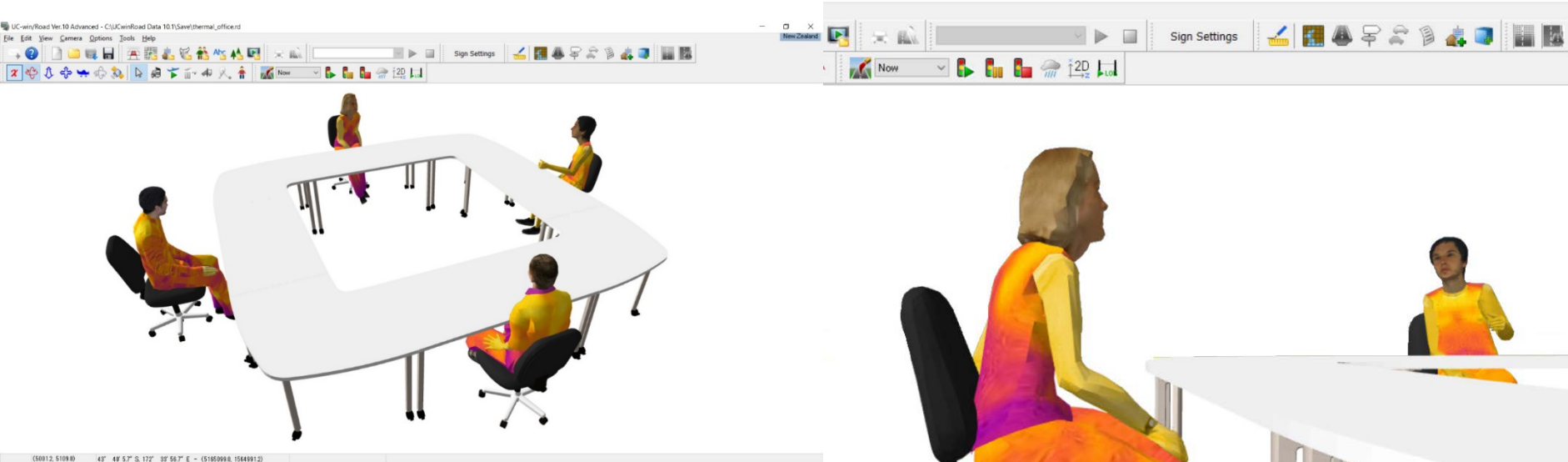
Capturing body posture in office-desk environment + Using Thermal Camera to document the same scene

** offset by varying clothing, time spent at posture ** need to add a "comfort level" survey ** need to record time at specific posture

* Possible use of "motion capture" facilities at Shenkar

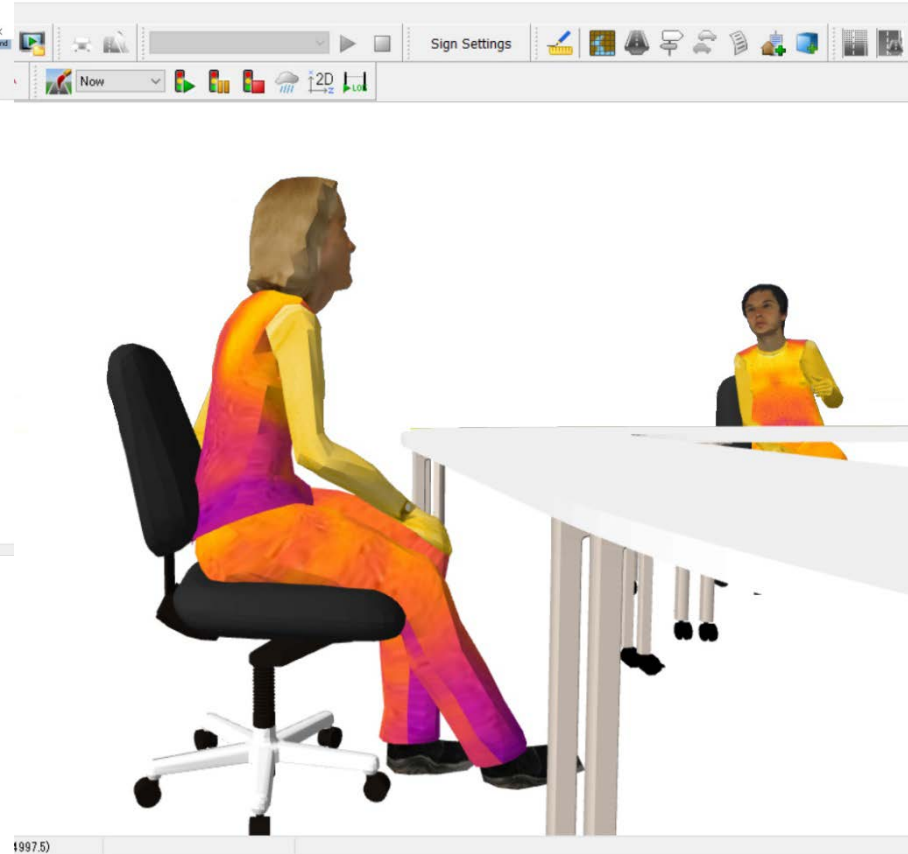
** possibility to capture thermal data also of office surrounding, to use to design a comfortable sustainable interior micro-climate. Example: Prof. David Pearlmutter.

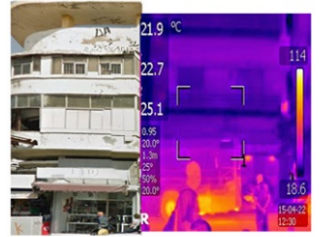
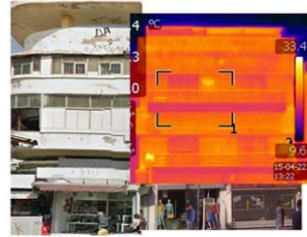
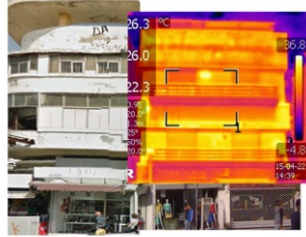
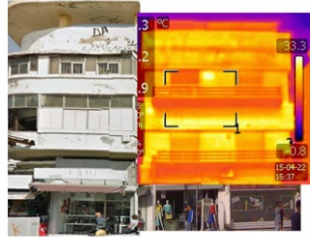
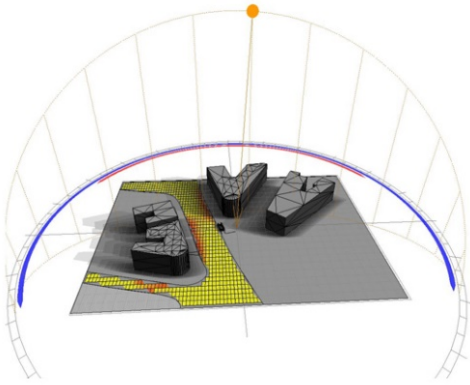
SITTING POSTURE ANALYSIS
POSTURE SIMULATION WITH UC/WIN-ROAD



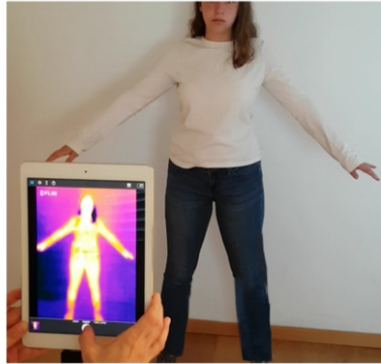
4 - POSTURE SIMULATION UC/WIN ROAD

3D Simulation of body posture



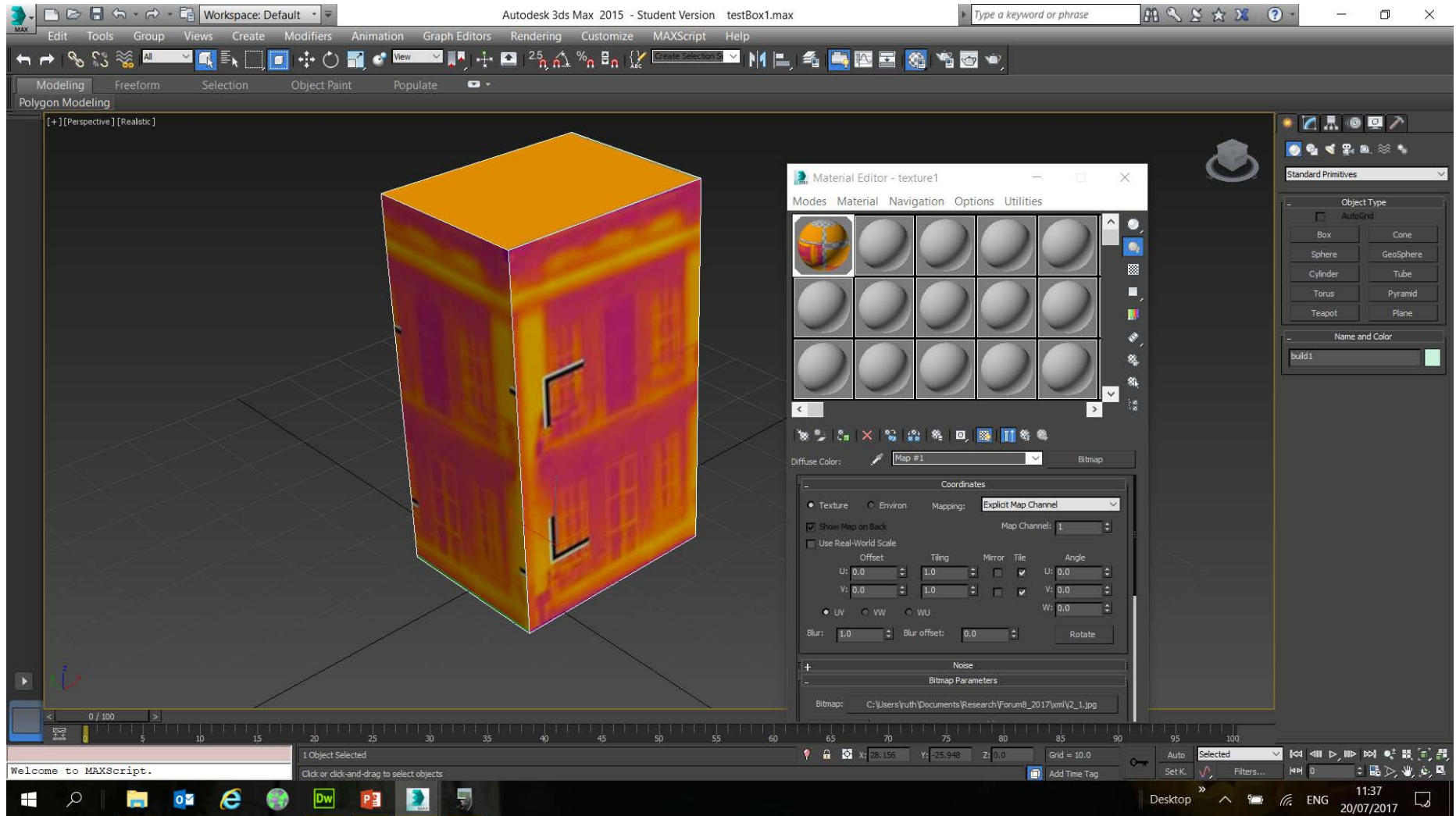


Representation of 2D thermal images with 3D models with **UC-Win/Road**



UC-Win/Road

Project- MIT workshop 2017



UC-Win/Road

Project- MIT workshop 2017

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Project- MIT workshop 2017

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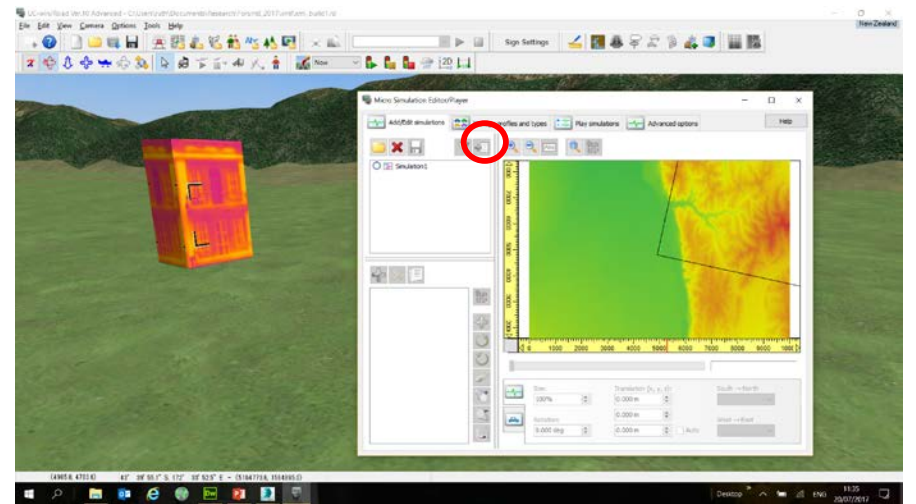
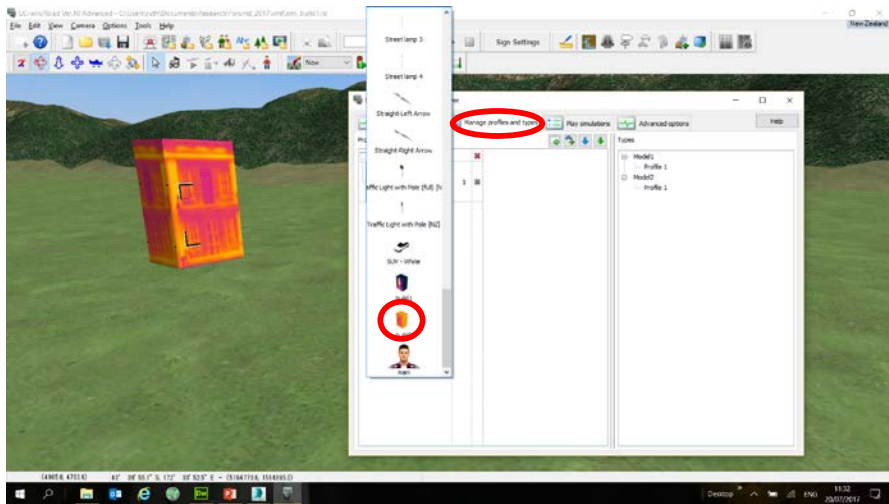
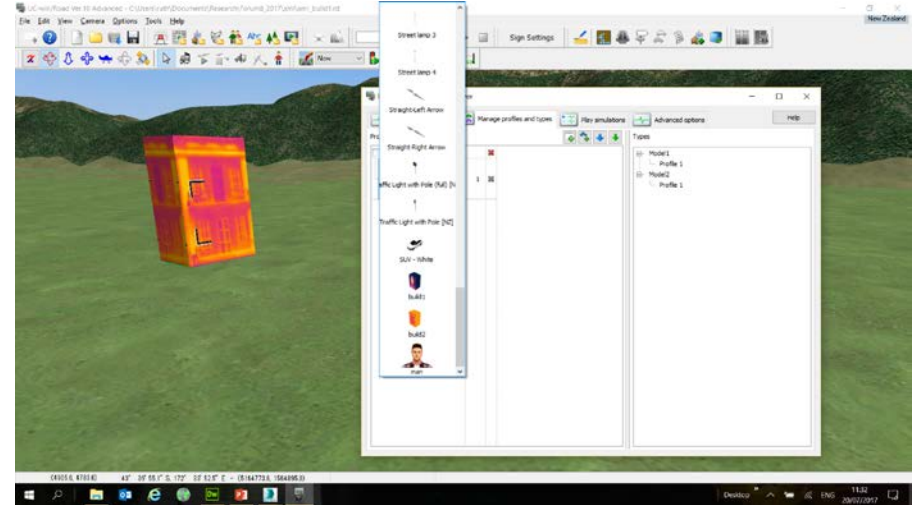
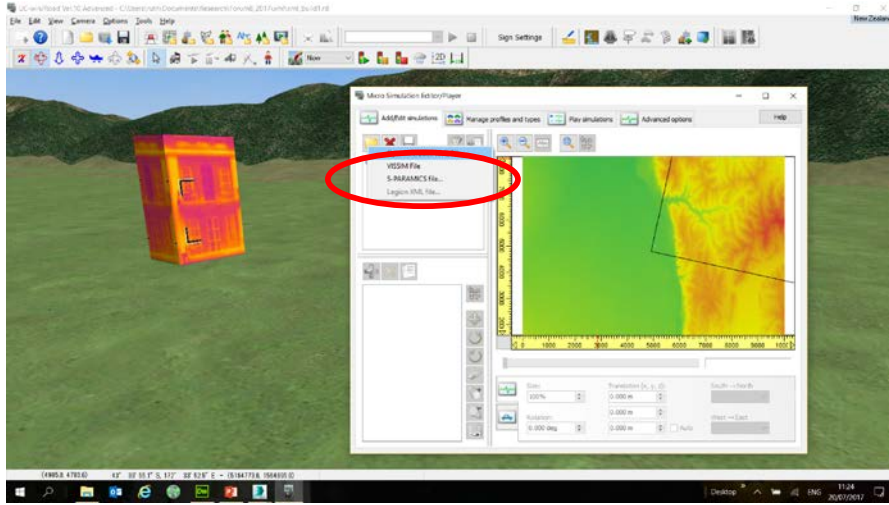
UC-Win/Road

Project- MIT workshop 2017

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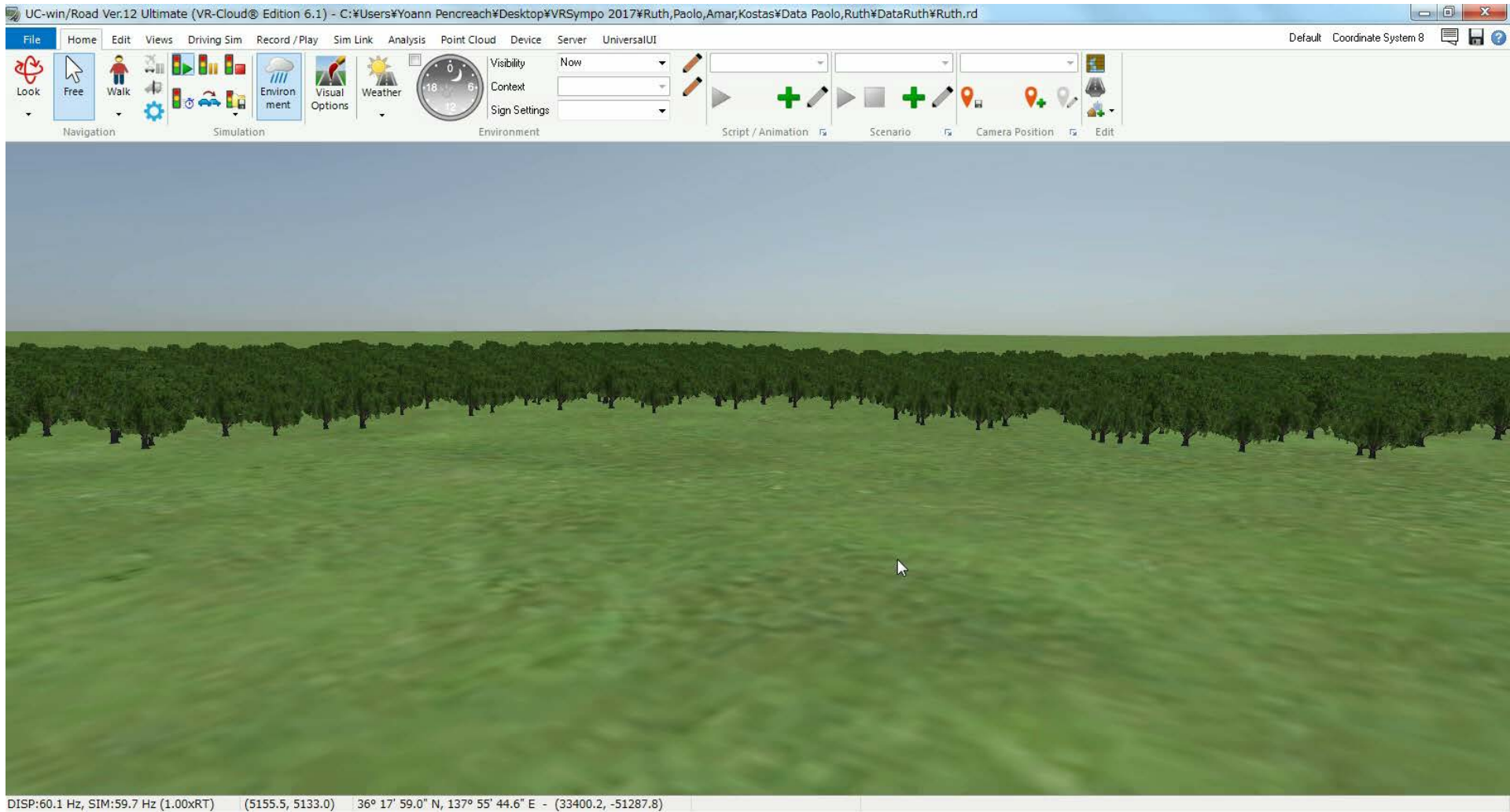
UC-Win/Road

Project- MIT workshop 2017



UC-Win/Road

Project- VR symposium, Tokyo 2017



UC-Win/Road

Project- VR symposium, Tokyo 2017