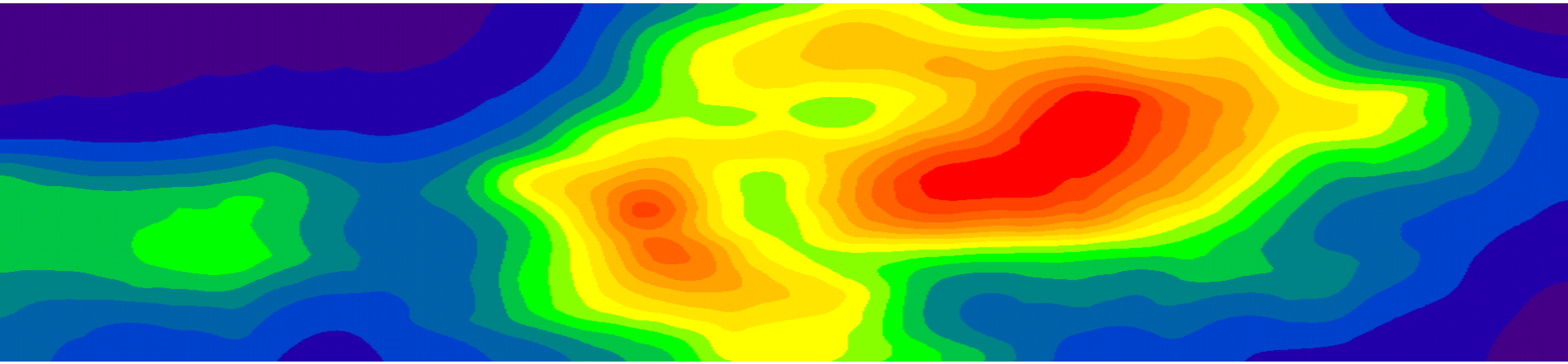
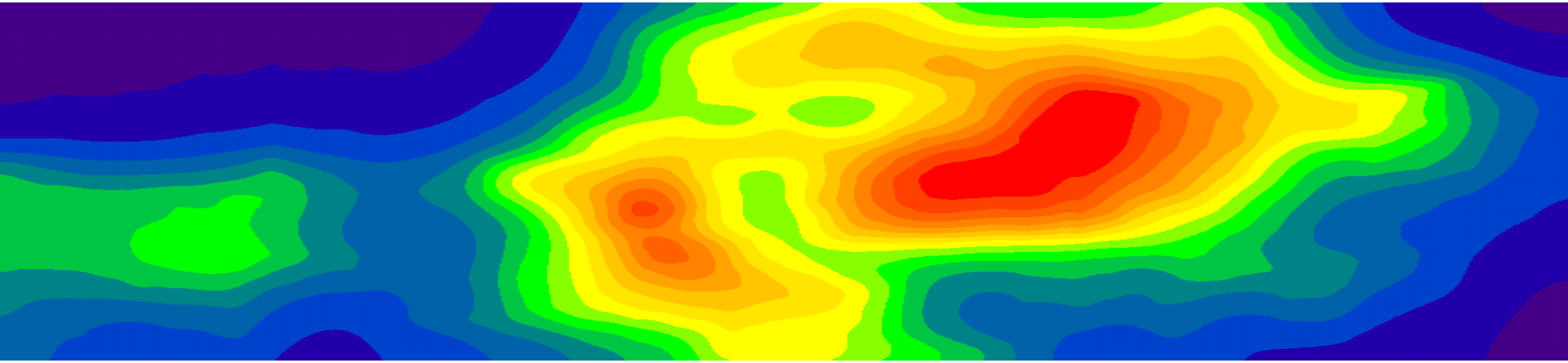


FORUM 8

Ruth Ron | Senior Lecturer | Shenkar College - Israel

Visualization of



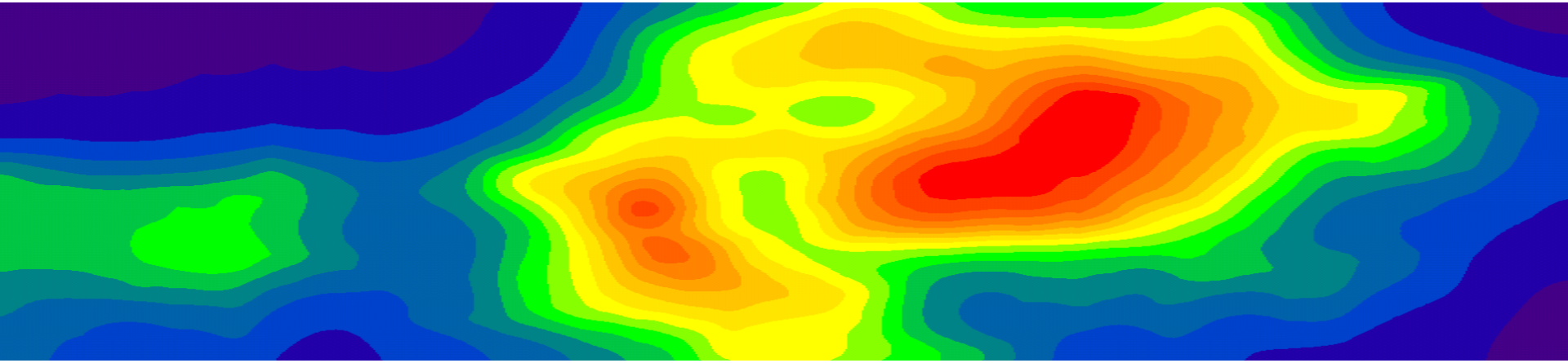
Invisible Environmental Parameters

Shenkar College
of Engineering and Design

FORUM 8

Ruth Ron | Senior Lecturer | Shenkar College - Israel

Visualization of



invisible Environmental Parameters

Research Collaboration:
Arch. Barak Pelman – Bezalel
Prof. David Pearlmutter – Desert Architecture & Town Planning, Ben Gurion University
Arch. Galit Shiff - Shenkar
Dr. Rebeka Vital – Shenkar
Modeling Assistant: Ori Eliyahu - Shenkar

Research Goals:

Research Goals:

Reveal invisible environmental properties

Research Goals:

Reveal invisible environmental properties

> Acoustic properties

> Thermal properties

> Air Pollution

> more...

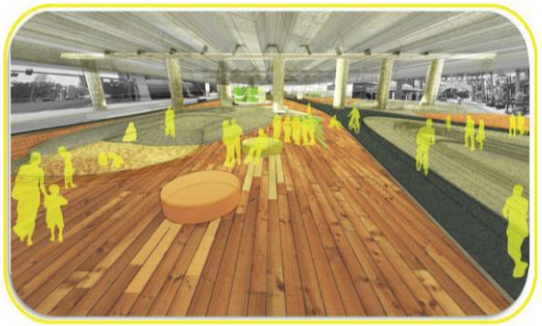
Research Goals:

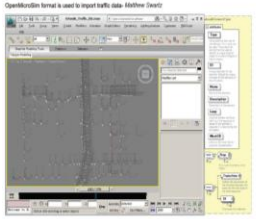
Reveal invisible environmental properties

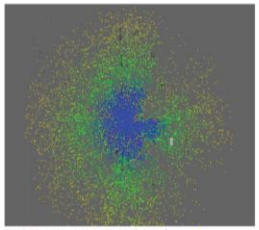
UC-Win/Road WORLD16 2010-2012
with Matthew Swartz

> Acoustic properties

From acoustic simulation to form generation ::
a case study in Performance-Oriented Design
under I-4 highway in downtown Orlando, Florida

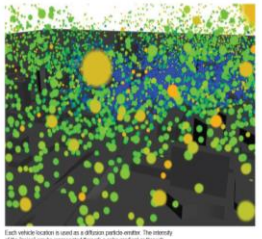






UC-WIN/ROAD to 3DMax

NOISE VISUALIZATION 1:
3DMax Particle
simulation to visualize noise from I-4 traffic
Matthew Swarts



Research Goals:

Reveal invisible environmental properties

> Thermal properties

Research Goals:

Reveal invisible environmental properties

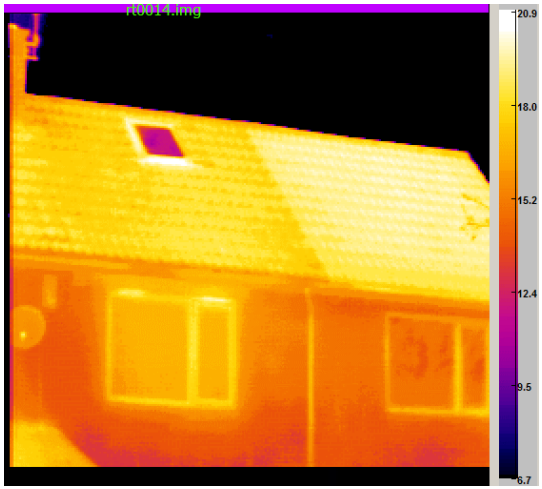
> Thermal properties

Using low-cost thermal cameras
to create façade VR texture-maps

Tools & Technology

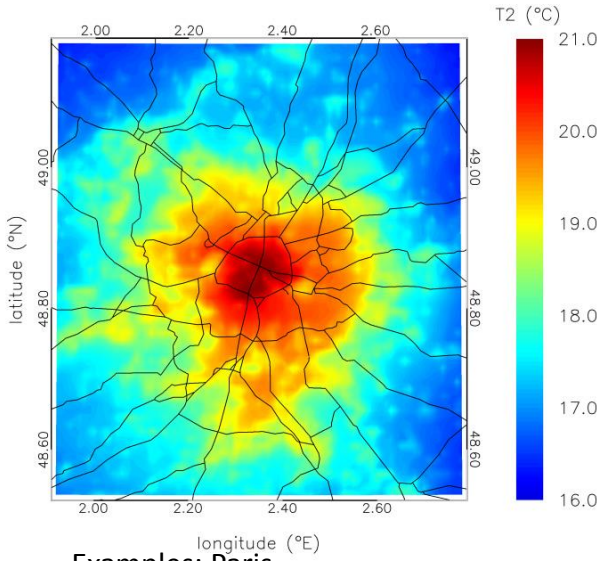
Hardware and Software

> Thermal Cameras



locating energy leak from: HVAC systems, windows and thermal bridges

Prof. Harvey Brian- ASU



Examples: Paris

Traditional use:
home/ building inspection

Academic Environmental research :
Mapping the "Heat Island Effect"

Tools & Technology

Hardware and Software

> Thermal Camera -Flir 350

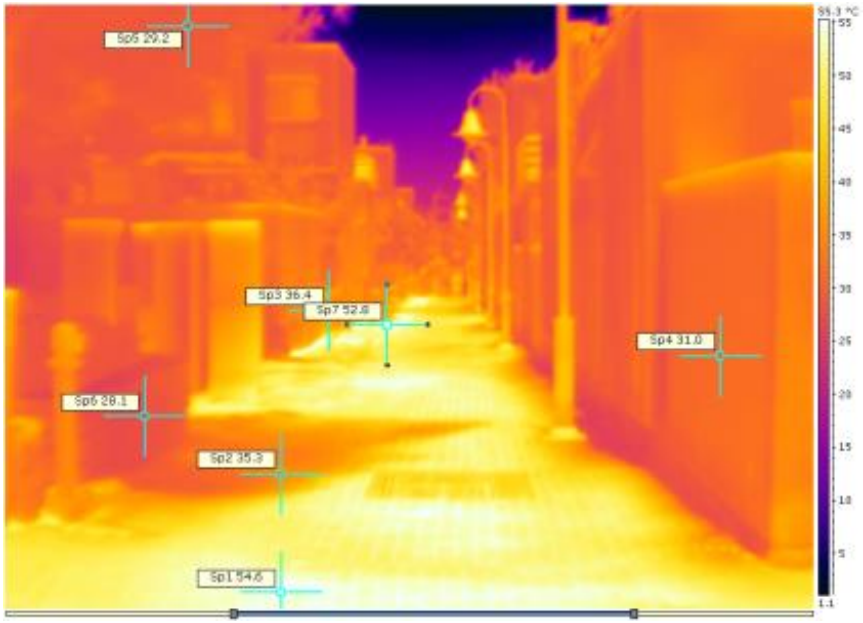


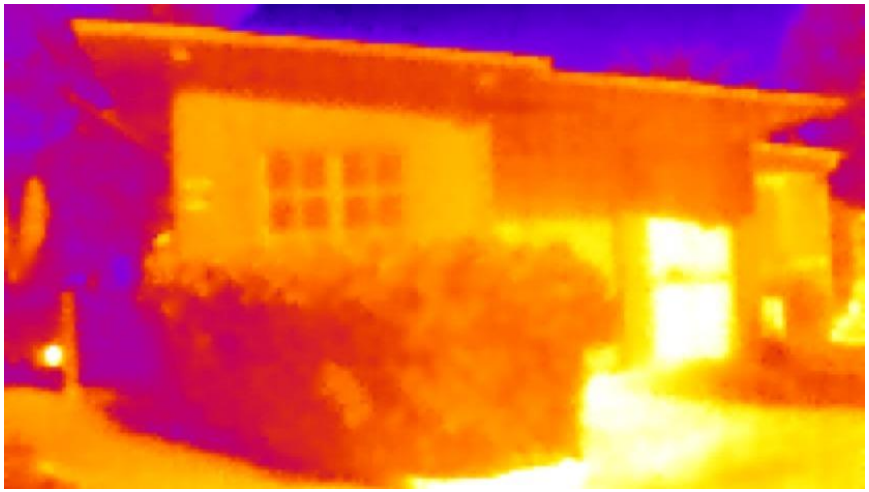
Image resolution: 320 X 240 pixels

Flir 350

Tools & Technology

Hardware and Software

> Thermal Camera - SEEK



SEEK Thermal for Mobile Phone

Image resolution: 206 x 156 pixels

Tools & Technology

Hardware and Software

> Thermal Camera -Flir ONE

FLIR One - for Mobile Phone

Image resolution: 160 x 120 pixels

Initial Research 2014

Project Proposal

Initial Research 2014

Project Proposal

Initiating project idea:

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

UC-Win/Road

Project

Thermal photography of building facades

> augmenting 3D models with thermal surface properties

UC-Win/Road

Project

Application of thermal images to VR Models:

Flir 350 – time lapse in urban square

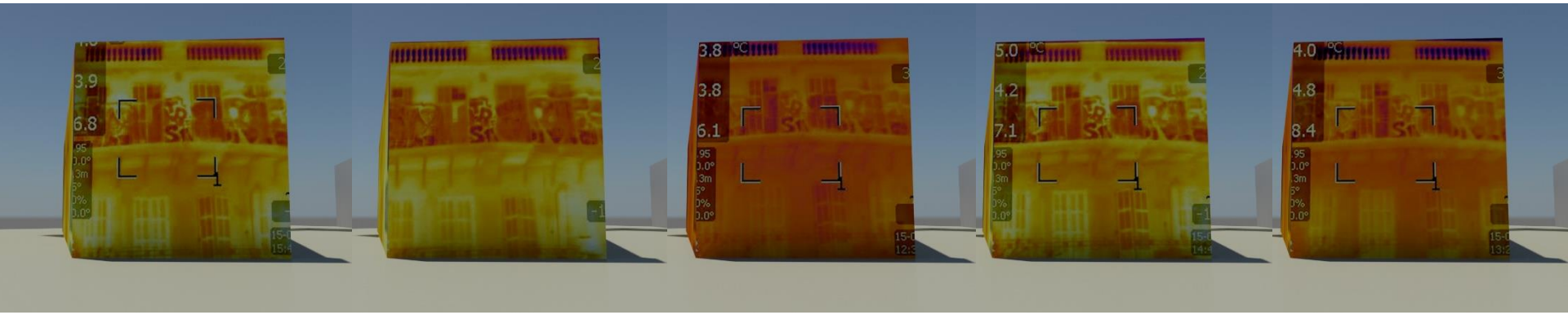
SEEK – capturing a building- Greece workshop

Flir ONE- model+ texture map - small building

UC-Win/Road

Project

> Thermal “time-lapse" of an urban area on a VR model



Problems:

> Change in temperature range

UC-Win/Road

Project

> Thermal “time-lapse" of an urban square
https://vimeo.com/126803301

UC-Win/Road

Project- Thessaloniki workshop 2015

SEEK - capturing a small building

Test:

trying to generate

3D model + texture maps

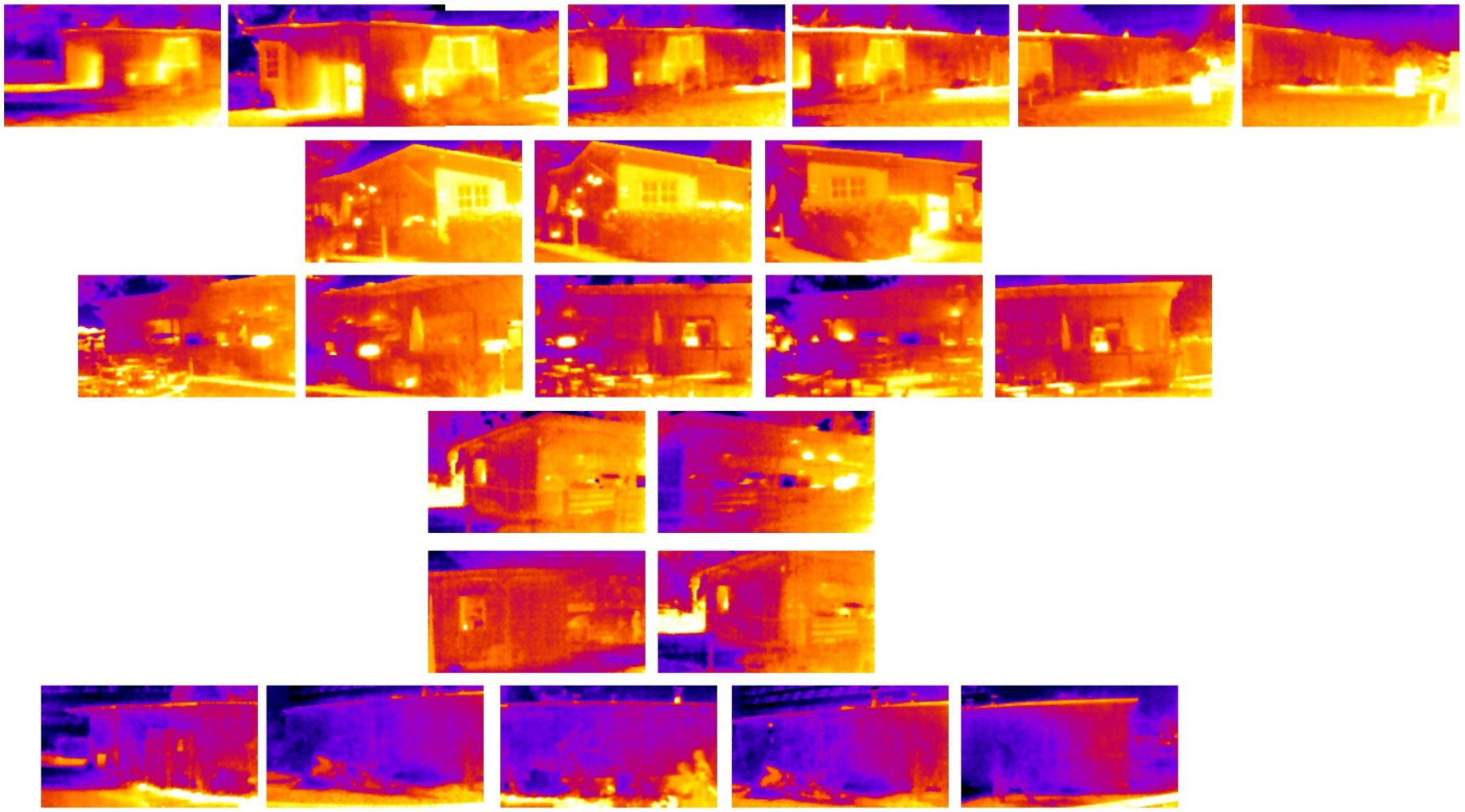
from thermal imaging

SEEK Thermal for Mobile Phone

Image resolution: 206 x 156 pixels

UC-Win/Road

Project- Thessaloniki workshop 2015



UC-Win/Road

Project- Thessaloniki workshop 2015

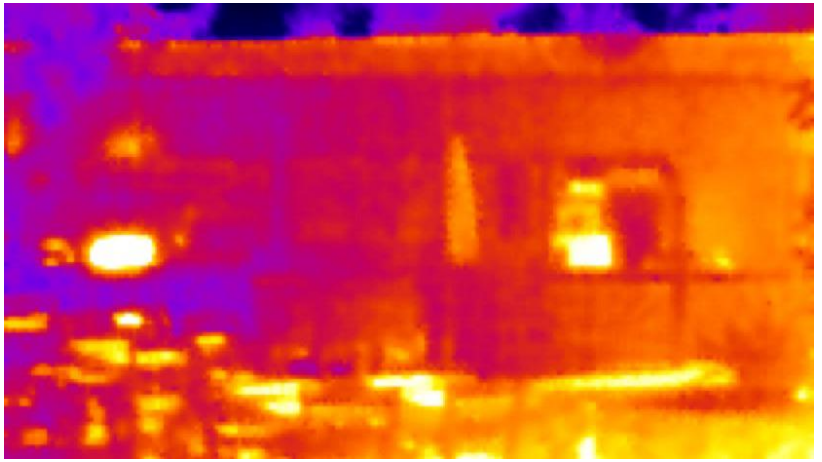
Problems:

1. No conventional image
2. Low resolution image
3. Blurred image

Flir - conventional

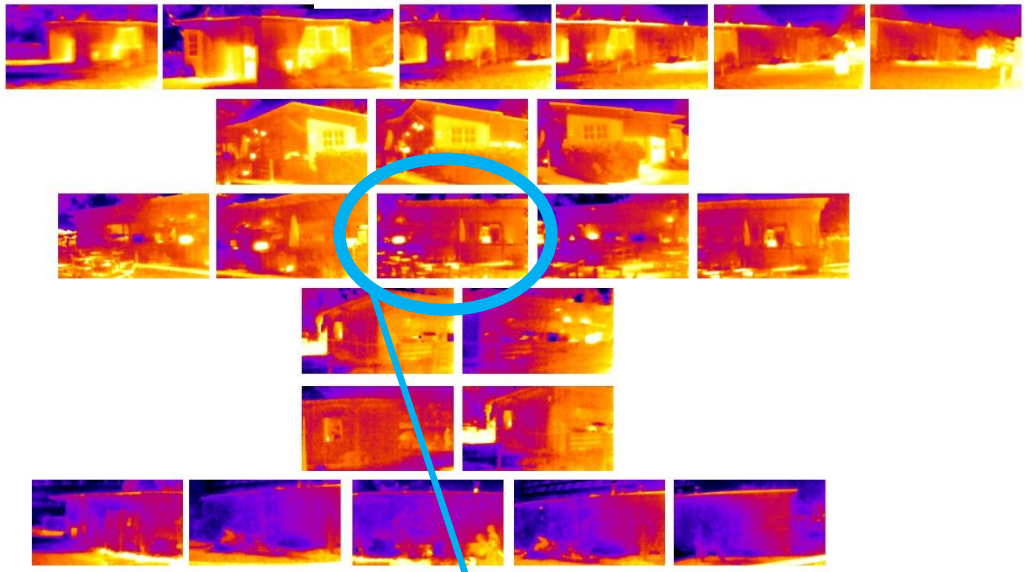
\+ thermal image

SEEK - only thermal image



UC-Win/Road

Project- Thessaloniki workshop 2015



Problems:

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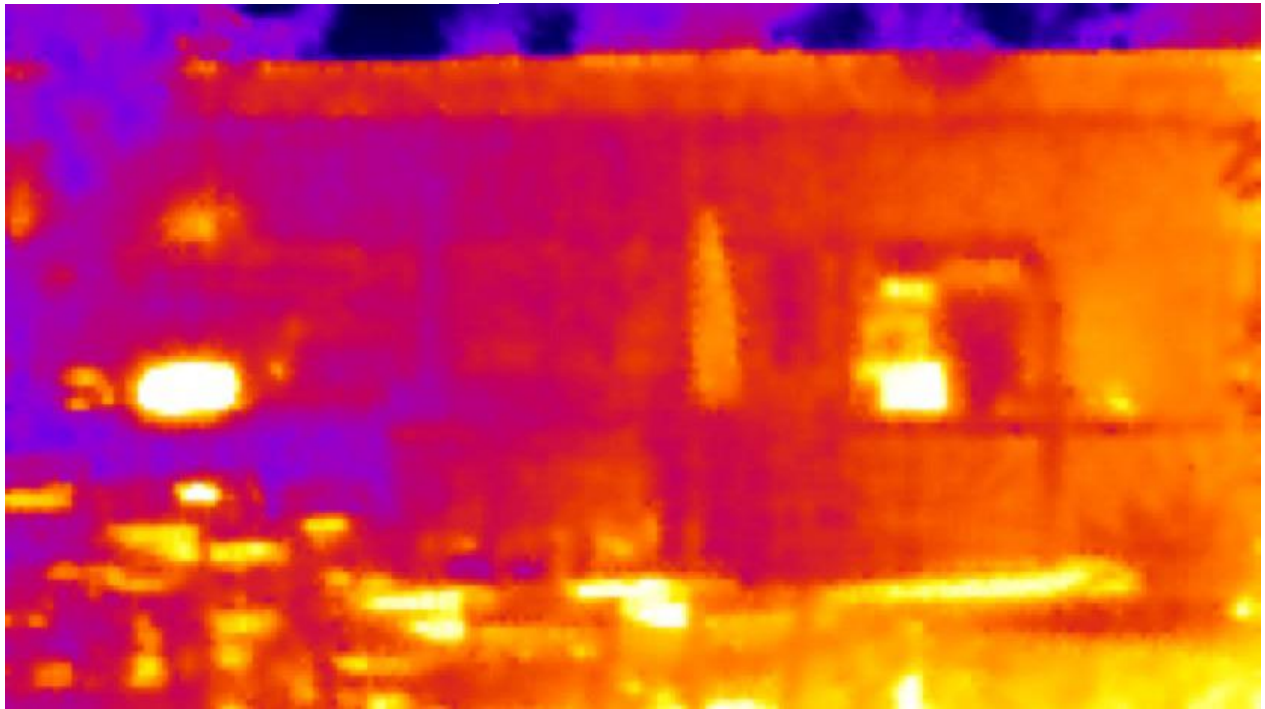
3. Blurred image



UC-Win/Road

Project- Florida workshop 2015

Flir ONE -

1 day workshop- FLORIDA

capturing a small building

UC-Win/Road

Project- University of Florida workshop 2015

Small building 1:

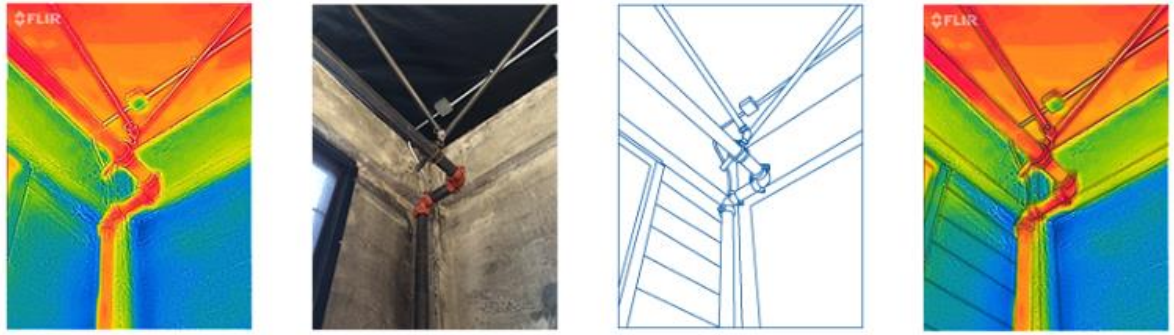
UC-Win/Road

Project- University of Florida workshop 2015

Advantages:

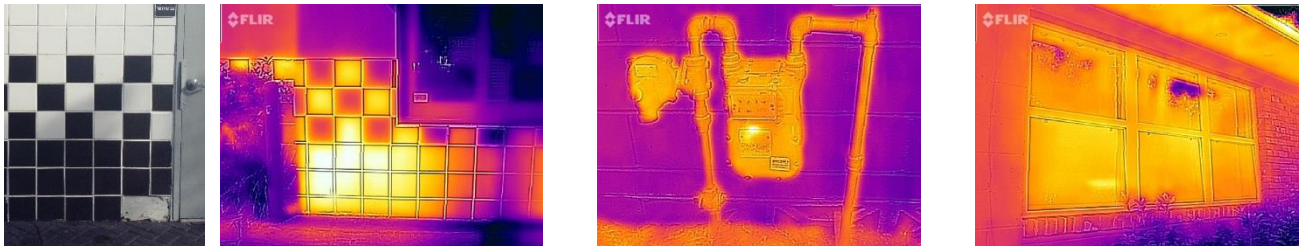
>Sharp images: MSX software

Blending edges from hi-res image



THERMAL IMAGE | VISIBLE IMAGE | EXTRACTED DETAIL | COMBINED IMAGE

>Good for capturing details



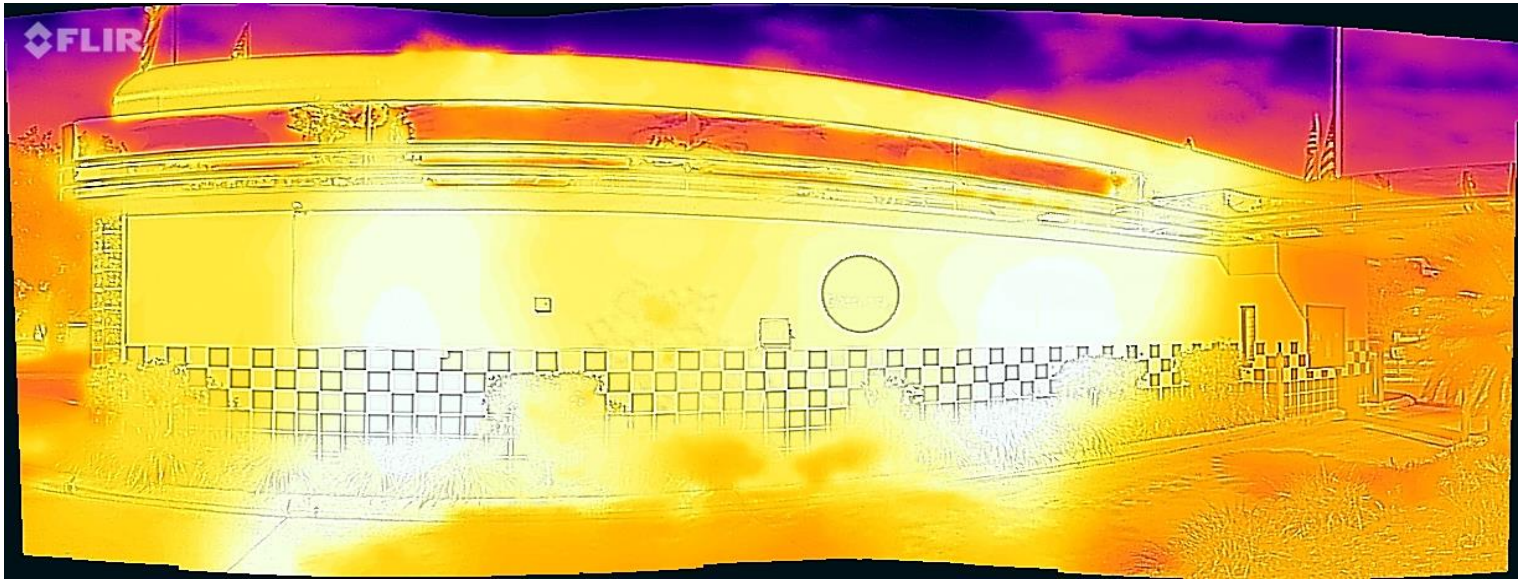
UC-Win/Road

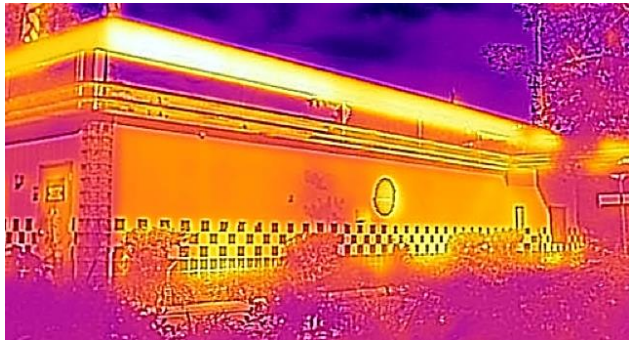
Project- University of Florida workshop 2015

Small building 2:

UC-Win/Road

Project- University of Florida workshop 2015





Problems:

Panoramic function '*out of range*'

UC-Win/Road

Project- University of Florida workshop 2015

Small building 3:

UC-Win/Road

Project- University of Florida workshop 2015

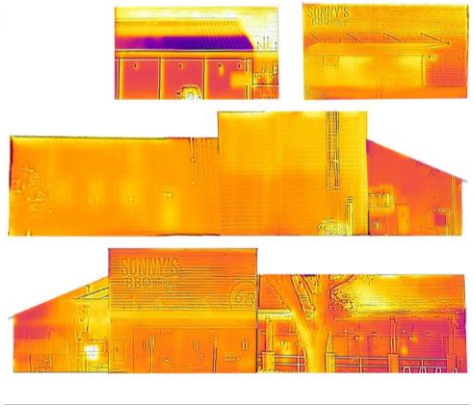
Problems:

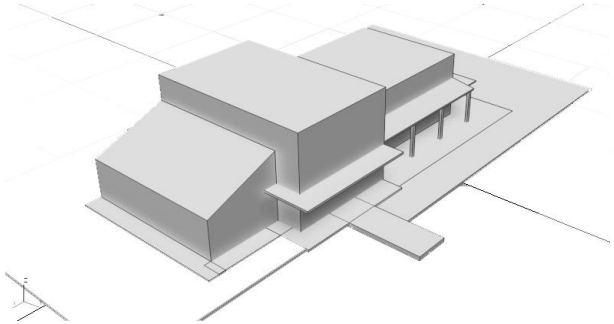
Can't set "thermal range"

UC-Win/Road

Project- University of Florida workshop 2015

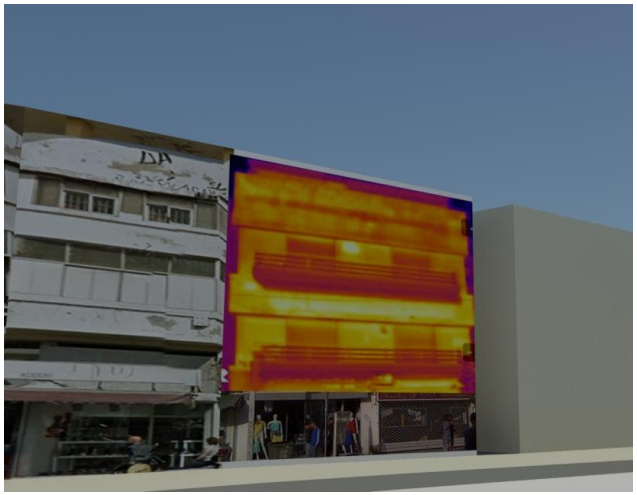
Modeling Process:





Thank you!

FORUM 8



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