HeatWave: 3D Thermography System

HeatWave is a lightweight handheld device that delivers accurate real-time temperature information overlaid on a precise 3D model of human body.

Adding the third dimension to thermal imaging

Conventional 2D thermal imaging requires expert knowledge in the capture process and in understanding and interpreting the results. It can also only capture small parts of the scene at once. We've therefore developed HeatWave, the next generation of handheld technology for heat mapping and 3D imaging. This lightweight (under 500g) mobile device can generate real time precise 3D models of objects or scenes, overlaid with accurate temperature information.

HeatWave Device

The prototype device consists of a 3D camera, color camera and thermal sensor. It can be freely moved (literally waved) around objects and spaces to achieve a variety of view angles and cover a larger portion of the scene. Our SLAM (simultaneous localisation and mapping) technology fuses the 3D snapshots to create an accurate 3D model onto which the thermal data is projected. The principal of projecting thermal data onto 3D can be applied to different 3D and thermal sensors, allowing for customised 3D thermal solutions to suit different applications.

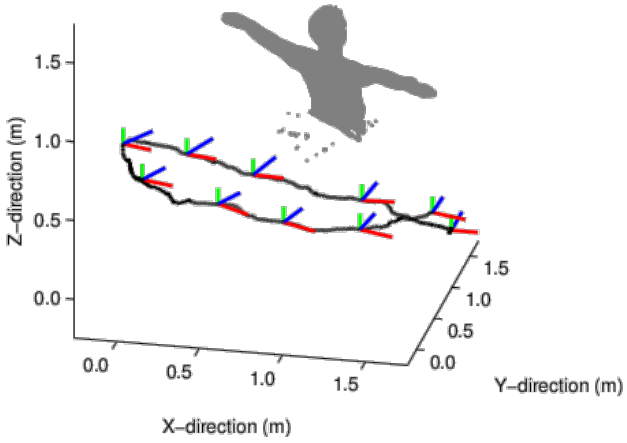
Versatile Results

The output of HeatWave is a single complete 3D model augmented with high accuracy, view independent temperature and visible information. This can be used to detect any appearance, shape, temperature or temporal changes within the environment. The dense, high-resolution 3D multispectral model can be visualised in either modality independently or both simultaneously.

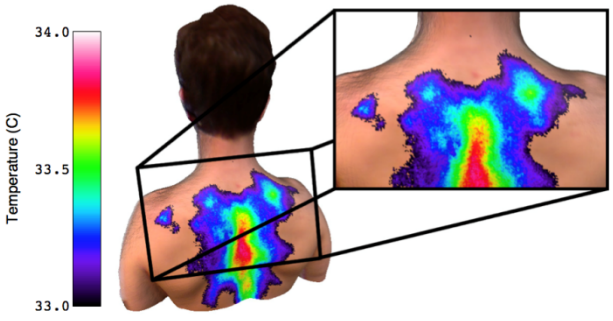
HeatWave Pro

HeatWave Tablet Scanner

HeatWave Systems



SLAM (simultaneous localisation and mapping)



3D Thermal-visual model of torso posterior view with right shoulder chronic inflammation

Value Propositions

- Reduces risk of injury
- Optimises exercise routines
- Optimises warm up/cool down strategies
- Identifies fatigue/dehydration levels
- Allows non-invasive and non-contact monitoring and examination
- Produces repeatable and quantitative measurements
- Reduces inaccurate image interpretation due to lack of standardisation
- Provides user-friendly information to detect changes in core/muscle temperatures

Customer Segments

- Sport Professional Teams
- Sport Professional Organisations
- Sport Service Providers
- Sport Insurance Organisations (indirect)

Awards

- iAwards for Research and Development

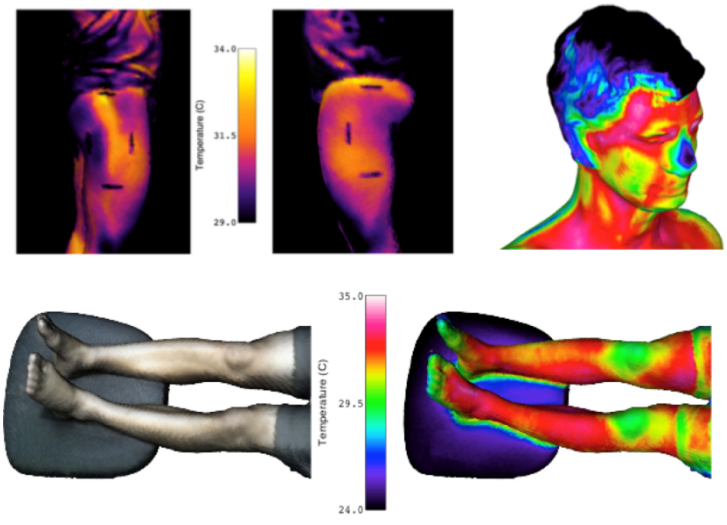
2014 iAWARDS National Award Winner

2014 iAWARDS Queensland Award Winner

HeatWave Specifications

3D camera range	Up to 4m (2m outdoors)
3D Thermal camera resolution	Super HD*
Temperature Range	-20°C to 900°C (select from 3 calibration ranges)
Temperature Sensitivity	< 40mk (0.04°C)
Thermal Accuracy	+/- 2°C
Thermal Spectral Range	7.5-13 µm
Max 3D Volume	5m x 5m @ 1cm resolution
3D Measurement Accuracy	+/- 0.1% (typically)
Power	< 300mA (via USB)
Weight	500g (current prototype)
Data Output Format	.las, .ply (mesh and pointcloud)

*Many images combined to produce super high resolution



Elite Sports

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FOR FURTHER INFORMATION

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