

EVENTO DE NETWORKING

HEALTHCARE & PHOTONICS

TECNOLOGIAS FOTÓNICAS APLICADAS AL SECTOR HEALTHCARE

26 MARZO/14

09.45h-17.00h
Parc Audiovisual
de Catalunya
Carretera BV-1274,
Km. 1, 08225 Terrassa
(Barcelona)



Sistemas ópticos de detección del cáncer de piel

Santiago Royo

**Centro de Desarrollo de Sensores,
Instrumentación y Sistemas (CD6)**

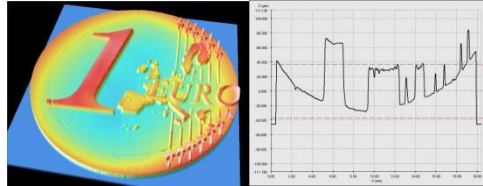
The CD6

- Staff: 40 people
 - 11 researchers
 - 17 R+D Engineers
 - 8 PhD Students
 - 4 Management
- Multidisciplinary:
 - Optics
 - Mechanics
 - Electronics
 - Software
- Site:
 - 1800 m²
 - Research labs
 - Mechanic & Electronic Workshops

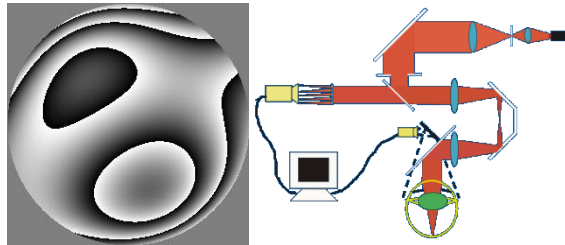


Development of prototypes and turn-key instruments

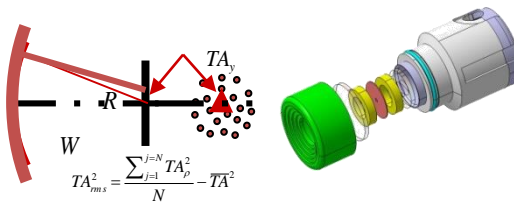
Research Areas



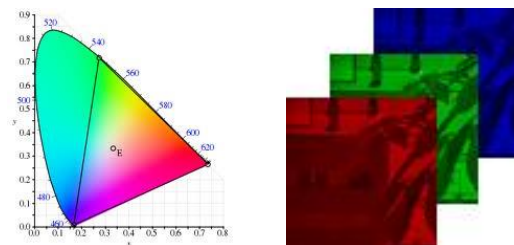
Optical Metrology



Visual Biophotonics

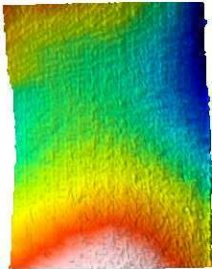


Optical Design

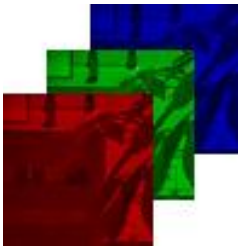


Color and Spectral Technology

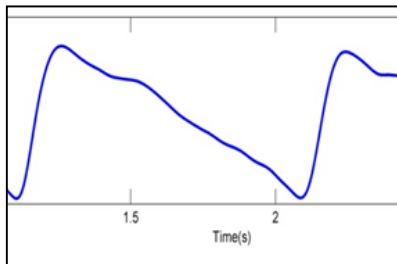
Enhancing detection of skin cancer



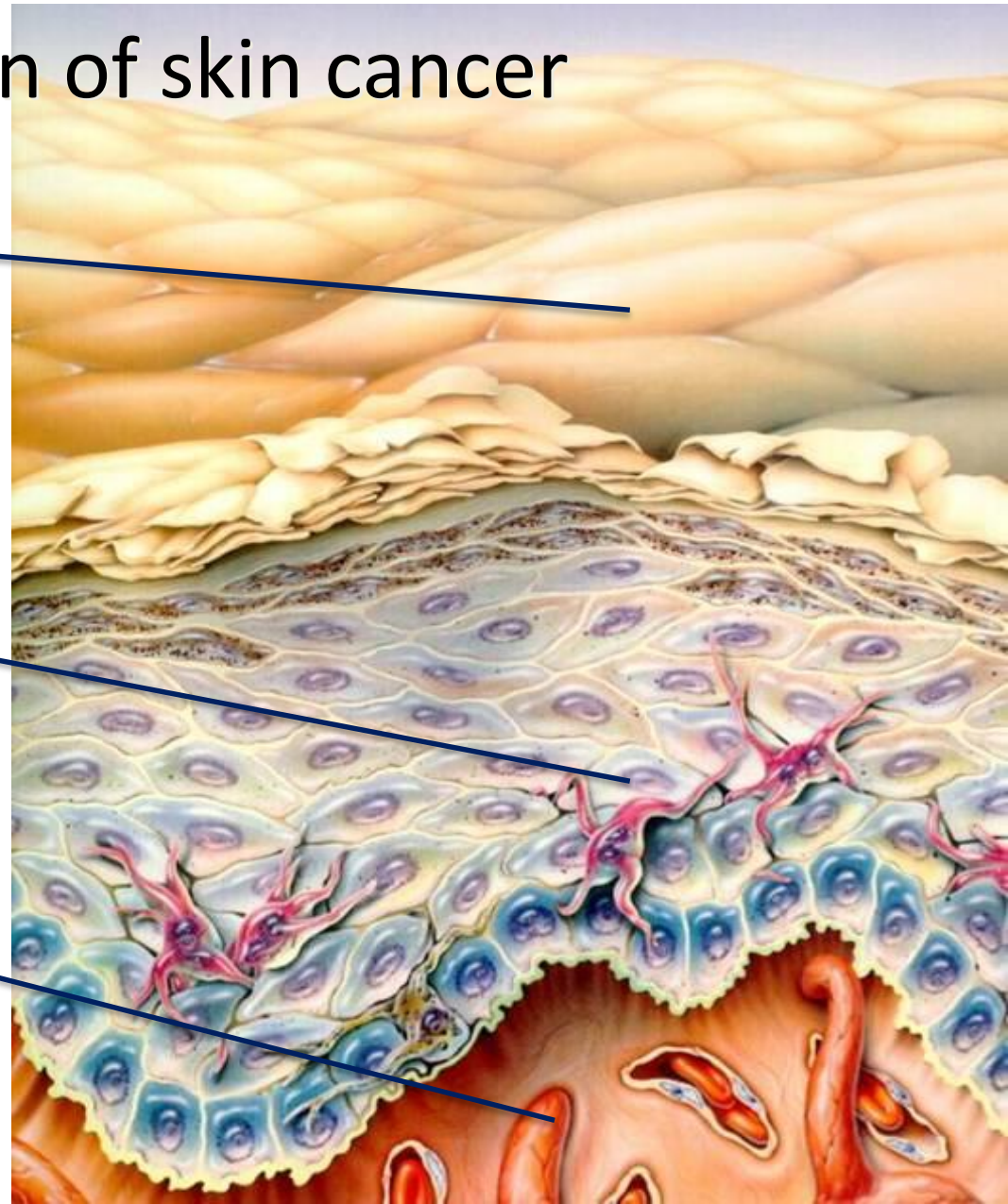
3D body imaging



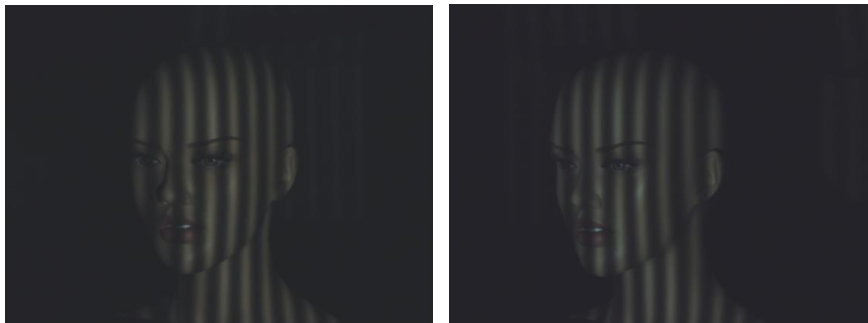
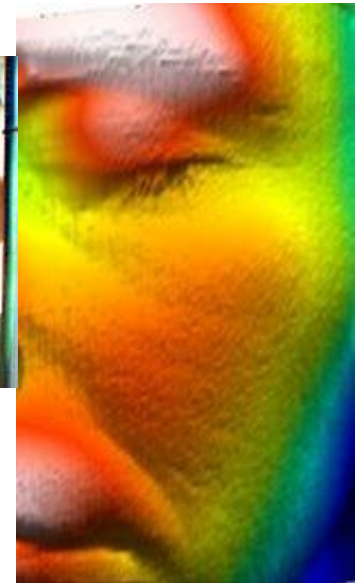
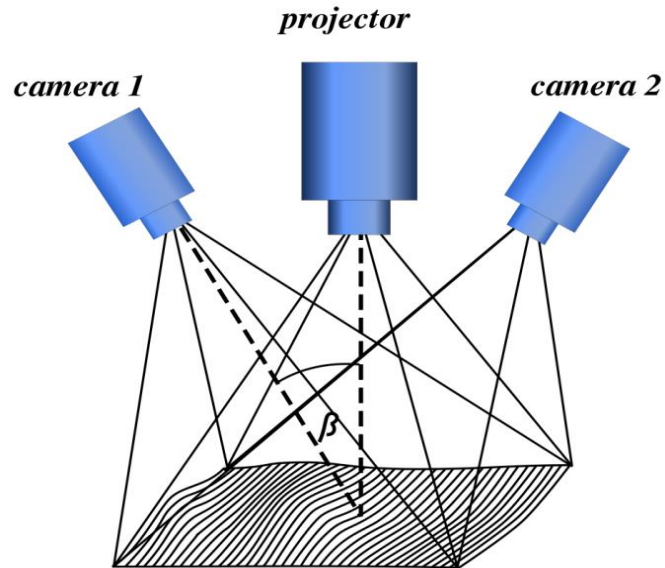
Multispectral imaging



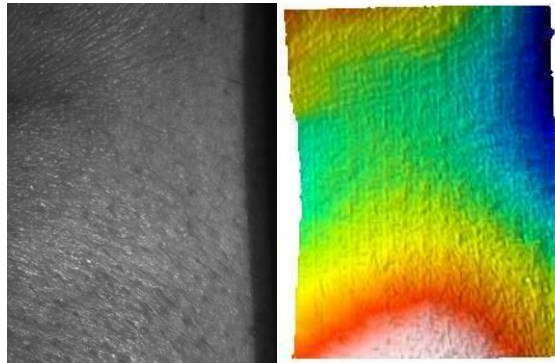
Laser flowmetry/
Optical feedback
interferometry



3D body imaging



3D body imaging



| ISO 4287 | | | | | |
|--|----|--------|---------|--------|--------|
| | | Mean | Std dev | Min | Max |
| Amplitude parameters - Roughness profile | | | | | |
| Rz | mm | 0.119 | 0.0192 | 0.0731 | 0.191 |
| Ra | mm | 0.0249 | 0.00419 | 0.0163 | 0.0413 |

Roughness

Shape

Volume



$$\Delta V = 5 \text{mm}^3$$

- Validation of aesthetic surgery (before/after)
- Simulation of aesthetic surgery processes (before)
- Evaluation of cosmetic treatments (fitness, creams...)
- Odontology (prosthetics)
- Non-contact, passive spirometry

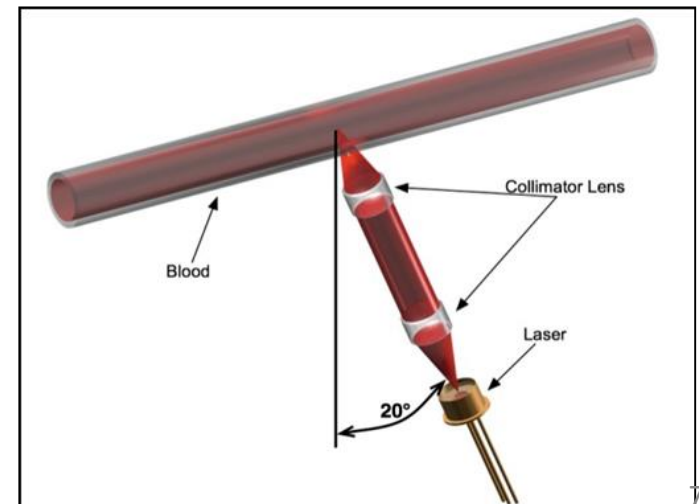
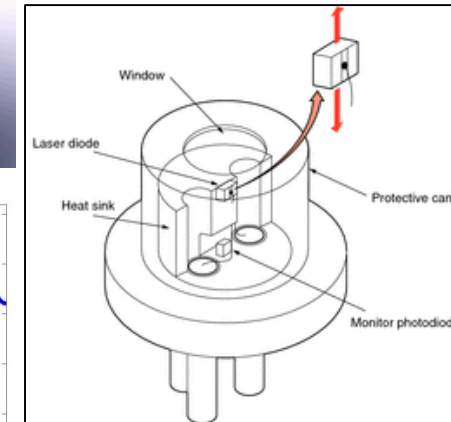
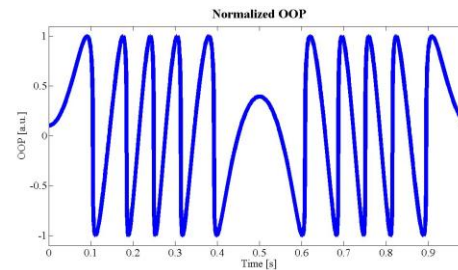
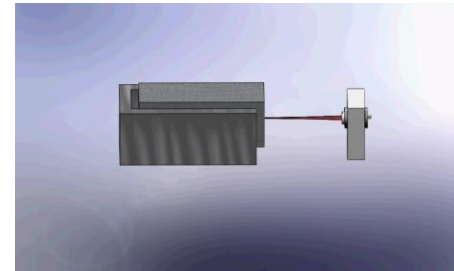
Optical feedback interferometry

Measures OPD changes $\Delta = n(\lambda, T, \dots) \times d_T$
and Doppler-like measurements
(speed, flow)

μm ($\lambda/10$) to nm ($\lambda/700$) accuracy

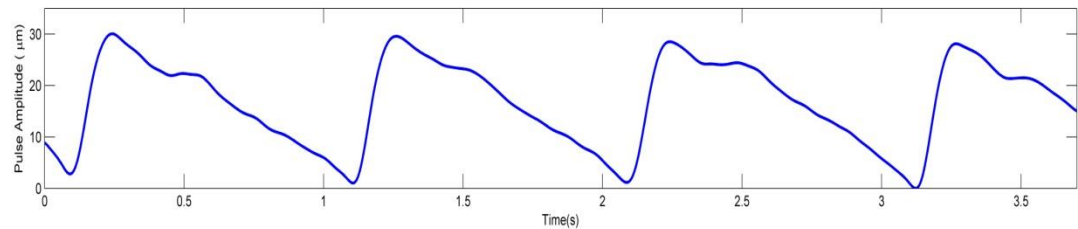
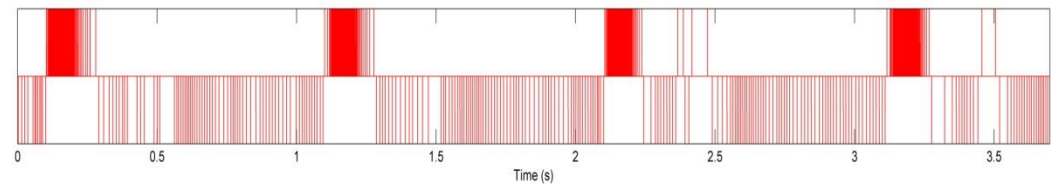
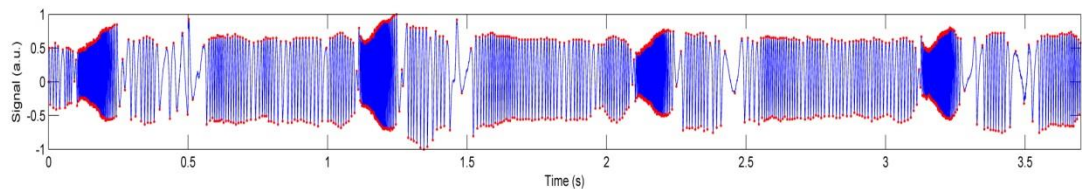
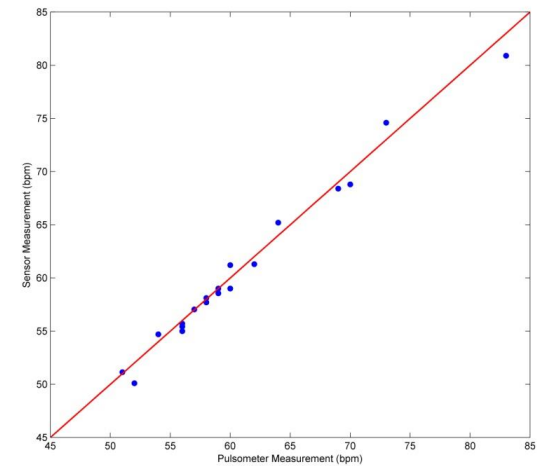
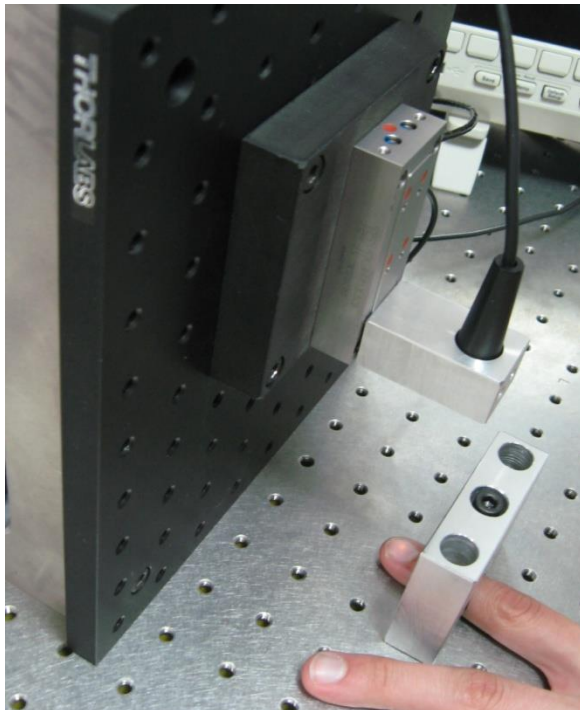
Low cost, accurate, compact, self-aligned

Noninvasive, noncontact blood flow measurements at low cost



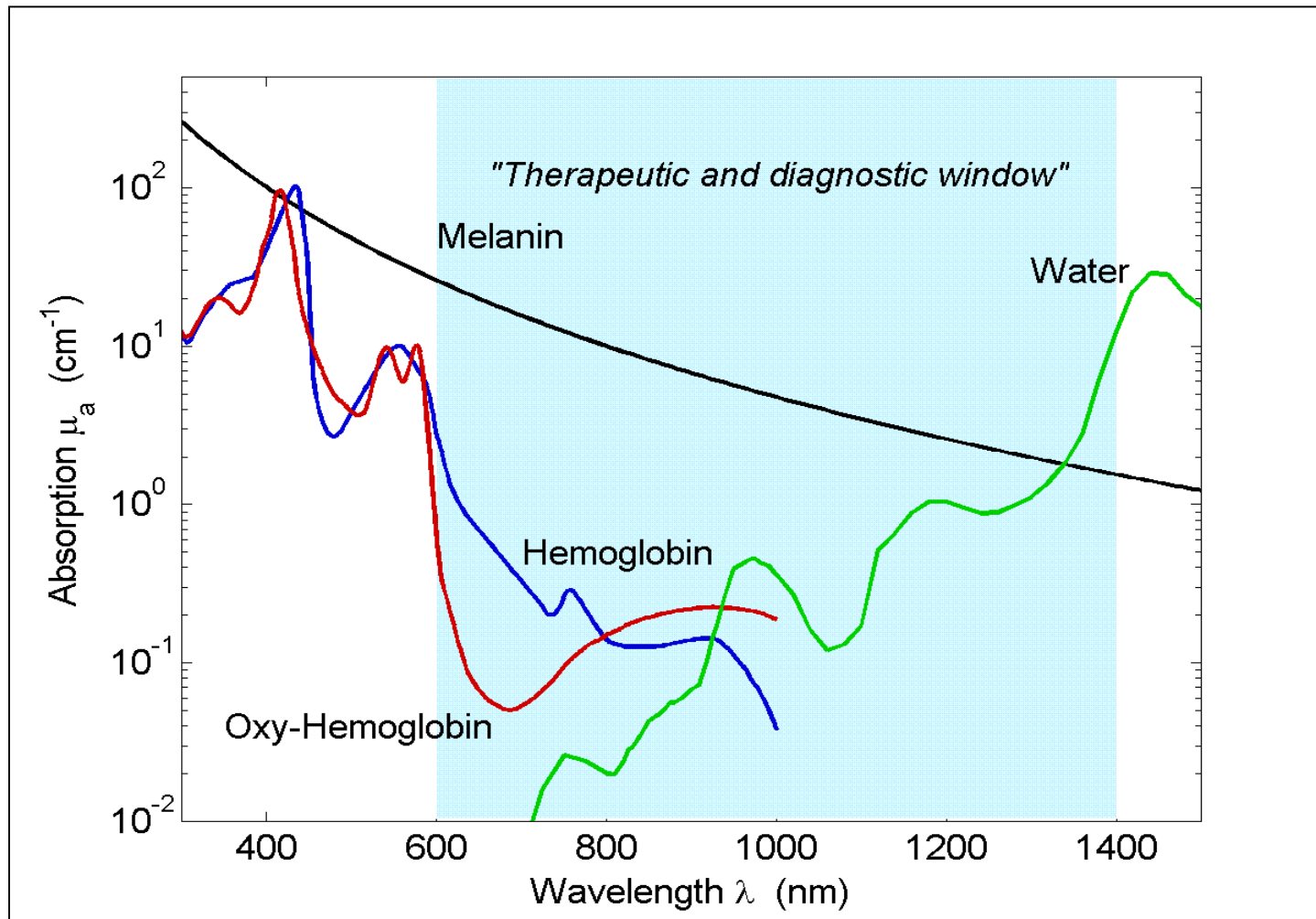
OFI in health

- Non contact APW measurement
- Microfluidics, lab-on-a-chip
- Cantilever sensor (bioelectricity)



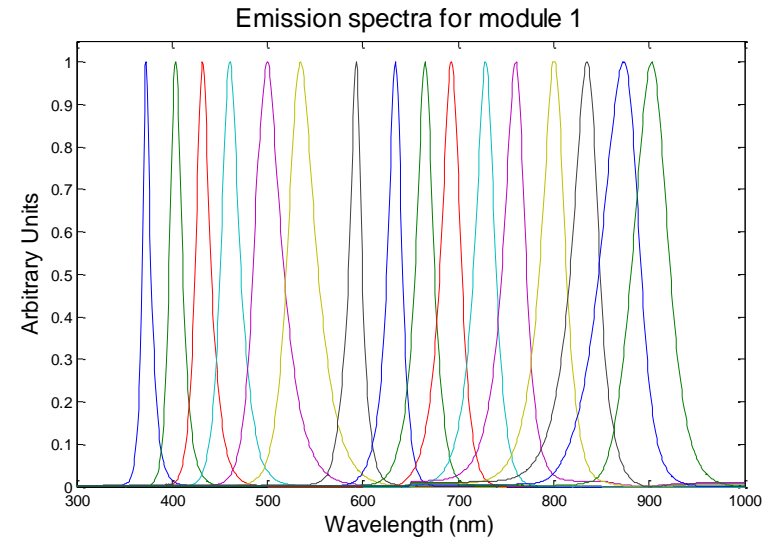
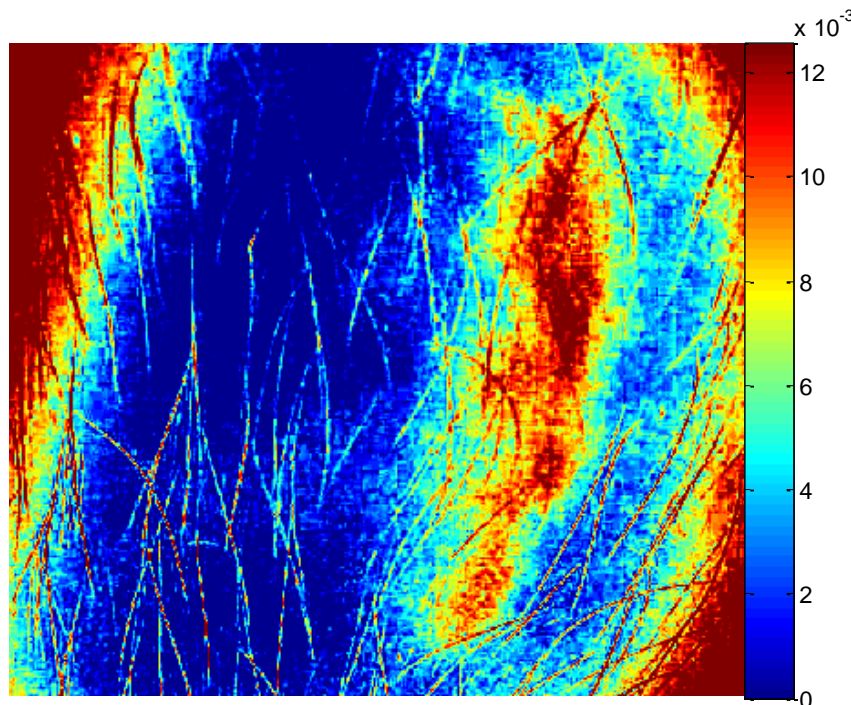
Multispectral imaging

Classification of skin lesions based on local skin chromophore ratios



Multispectral imaging

Multispectral analysis of lesions enables the detection of concentrations of specific chromophores in skin



Etibar - Inpus d'anàlisi

Adquirir [Adquirir] Estat: En espera

Sistemes: Càmera: [Càmera] Interfície: [Interfície]

Color de la pell [Color de la pell] Taques de la pell [Taques de la pell]

Interval d'àrea de taques detectable: Entre [1] i [300] mm²

Anàlisi de la imatge: Taques vàlides: 1, Taques detectades: 6

Taca seleccionada: Referència: Àrea: [Àrea], Pixels: [Pixels], mm², Llargada: [Llargada], Alçada: [Alçada]

Observacions: [Observacions]

Nivell color: R: 88, G: 73, B: 64

Cursor: X: 609, Y: 272

ANTONIO PUIG

Current healthcare projects

Coordinators



diagnoptics



Novel tools for fast and reliable skin cancer diagnosis and prognosis

Design, build and test pilot services in hospitals for early & specific skin cancer detection

Multimodal in-vivo platform with four different photonic technologies

Ex-vivo platform for optimized surgery procedures

Piloted in ESP and ITA at two hospitals

@diagnopticsprj



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IDIBAPS
Institut D'Investigacions Biomèdiques August Pi i Sunyer



MAVIG VivaScope

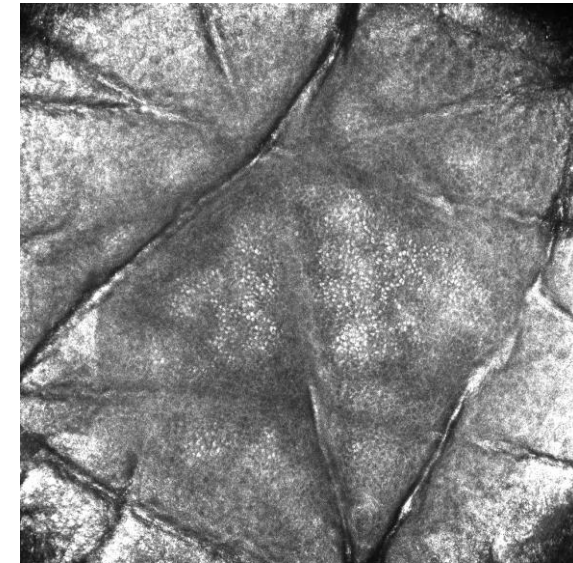
carril instruments

Current healthcare projects

Co-chairs



BM1205: European Network on Skin Cancer Detection using Laser Imaging



File Name: test_pino_2_test_v0000019.bmp L: 630px test Patient: test_pino_2
Z: 123.70 um Laserleistung: 5.0 mW L: 1: 030 nm

Sort By Album by Date Edit Album by Label Results HELP

| | | |
|-------------------------------------|------------------------------------|-----------------------------------|
| | | |
| Jun 6, 2011 back2 High | Jun 6, 2011 belly Low | Jun 6, 2011 leg2 Low |

Image Analysis Self Assessment Notes

left arm
Jun 6, 2011
Self-assessed risk: High

A - Asymmetry **medium**

B - Border irregularity **medium**

C - Color (darkest zone) **dark**

D - Diameter **7 mm**





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I TECNOLOGIA

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