

IJUP'11

meeting
of young
researchers
of U.Porto

th

U. PORTO



ELSEVIER

IJUP Committee



Adrián Silva
Aurora Teixeira
Elisa Keating
Filipe Magalhães
Georgina Silva
Gonçalo Furtado
Graciela Machado
Hélder Bastos
Helena Madureira
Jorge Gonçalves
Jorge Teixeira
José Rodrigues Lima
Laura Oliveira
Luís Miguel Madeira
M.^a Paula Santos
Manuela Aguiar
Marcela Segundo
Maria José Oliveira
Patrícia Antunes
Paula Coelho
Pedro Sousa Gomes
Rita Faria
Sofia Rodrigues
Vitor Vasconcelos

Program

Thursday, February 17th

09:00-09:30	Registration	
9:30-11:00	Parallel Oral Sessions I	
	A1 - Biological, Environmental & Health Sciences I	p. 7
	A2 - Biological, Environmental & Health Sciences II	p. 15
	A3 - Literature & Language Sciences	p. 23
	A4 - Engineering I	p. 31
	A6 - Communication Sciences I	p. 39
11:00-11:30	Welcome Session - A1	
11:30-12:30	Poster Session & Coffee Break	
12:30-14:00	Lunch Break	
14:00-15:30	Parallel Oral Sessions II	
	A1 - Biological, Environmental & Health Sciences III	p. 47
	A2 - Biological, Environmental & Health Sciences IV	p. 55
	A3 - Psychology & Education Sciences I	p. 63
	A4 - Engineering II	p. 71
	A5 - Applied Physics	p. 79
15:30-17:00	Poster Session & Coffee Break	
17:00-18:30	Parallel Oral Sessions III	
	A1 - Biological, Environmental & Health Sciences V	p. 87
	A2 - Biological, Environmental & Health Sciences VI	p. 95
	A3 - Geography, Sociology & Economics I	p. 103
	A4 - Engineering III	p. 111
	A5 - Law and Criminological Sciences	p. 117

Friday, February 18th

9:00-10:30	Parallel Oral Sessions IV	
	A1 - Biological, Environmental & Health Sciences VII	p. 125
	A2 - History, Visual & Cultural Studies I	p. 133
	A3 - Communication Sciences II	p. 139
	A4 - Engineering IV	p. 147
	A5 - Engineering V	p. 155
	A6 - Architecture	p. 163
10:30-11:00	Poster Session & Coffee Break	
11:00-12:30	Parallel Oral Sessions V	
	A1 - Biological, Environmental & Health Sciences VIII	p. 171
	A2 - History, Visual & Cultural Studies II	p. 179
	A3 - Psychology & Education Sciences II	p. 185
	A4 - Engineering VI	p. 193
	A5 - Sport Sciences I	p. 201
	A6 - Agronomy & Chemistry I	p. 211
12:30-14:00	Lunch Break	
14:00-15:30	A1 - Workshop "The Researcher's Checklist"	
15:30-17:00	Poster Session & Coffee Break	
17:00-18:30	Parallel Oral Sessions VI	
	A1 - Biological, Environmental & Health Sciences IX	p. 219
	A2 - Communication Sciences III	p. 225
	A3 - Agronomy & Chemistry II	p. 233
	A4 - Geography, Sociology & Economics II	p. 241
	A5 - Sport Sciences II	p. 249

Abstract Book Index

Oral Sessions

<i>Parallel Oral Sessions I</i>	
<i>Thursday, February 17th</i>	<i>p. 7</i>
<i>Parallel Oral Sessions II</i>	
<i>Thursday, February 17th</i>	<i>p. 47</i>
<i>Parallel Oral Sessions III</i>	
<i>Thursday, February 17th</i>	<i>p. 87</i>
<i>Parallel Oral Sessions IV</i>	
<i>Friday, February 18th</i>	<i>p. 125</i>
<i>Parallel Oral Sessions V</i>	
<i>Friday, February 18th</i>	<i>p. 171</i>
<i>Parallel Oral Sessions VI</i>	
<i>Friday, February 18th</i>	<i>p. 219</i>

Posters

<i>Posters I</i>	
<i>Thursday, February 17th</i>	<i>p. 259</i>
<i>Posters II</i>	
<i>Friday, February 18th</i>	<i>p. 405</i>

Index

p. 553

LipoTool - Mechanical design of a new Calliper

A. Monteiro¹, T. Andrade¹, T. Restivo¹, M. R. Quintas¹, C. M. Silva¹ and T. Amaral²

¹ IDMEC-Polo FEUP, Faculty of Engineering of University of Porto, Portugal.

² Faculty of Nutrition and Food Sciences, University of Porto, Portugal.

The Measurement of body composition is highly relevant in health. For instance, it is a current procedure in the assessment of individual nutritional status, in the evaluation of body growth, in the analysis of the impact of disease and in body monitoring in sports.

However, the existing calipers have experienced insufficient progress, suffering of different limitations and shortcomings, namely inconsistency in the data collecting process. In addition, since many reference calipers still require manual data recording, their operation is time consuming and may demand a second technician, even increasing the evaluation error.

This novel wireless skinfold caliper was developed in order to address these issues. The device is based on the use of low cost and portable equipment.



The developed prototype uses the general working principle of a typical skinfold calliper, integrating important additional elements for improving working characteristics, accuracy and measuring range. It comprises housing with a cylindrical part and a handle extension, one structure with two jaws with hinged end tips and a lever.

The housing includes all the force transmission mechanical elements from the constant force actuator to the jaws, the sensing element, a power supply and the electronic system which is responsible for the management of the whole device and for establishing the communication with the software application residing in the remote station where data is recorded in an integrated database.

This device has a novel mechanical design distinct from those available in the market. It uses a constant force actuator within the housing handle, which imposes a constant contact pressure between the end tip faces and the skinfold under measurement. It also offers an opening limit increase of the end tips. Electronic and mechanical features make it able of performing dynamic measurements. The device prototype was calibrated at CATIM and evaluated in health environment under UPorto protocol. This novelty justifies a patent submissions at National[1] and International[2] levels and has been also the reason for two awards in 2010 – 1st place Innovation in Nutrition Awards 2010 and FEUP Colheita 75.

References:

[1] Patent submission PT 105187, pending.

[2] Patent submission PCT/IB2010/055701, pending.