



## Conference Programme



Associação Portuguesa de Mecânica Teórica, Aplicada e Computacional



**Co-Chairs:**

**João Manuel R. S. Tavares** ([tavares@fe.up.pt](mailto:tavares@fe.up.pt))  
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# PROGRAMME

## Tuesday, October 15

17:00 – 18:30

Early Registration

## Wednesday, October 16

8:00 – 9:30

Registration

9:30 – 9:45

Welcome

Room I

9:45 – 10:30

Keynotes I

Room I

*From medical imaging to clinical biomechanics of the spine and related innovation*  
**Wafa Skalli**

10:30 – 11:00

Coffee Break

11:00 – 12:30

Oral Presentations

Room I		Room II	
Chairpersons:	ORAL I	Chairpersons:	ORAL II
<i>Isabel Figueiredo, Daniela Iacoviello</i>		<i>Carlos Rodrigues, João Nunes</i>	
11:00 – 11:15	Colonic Polyp Identification using Pareto Depth Anomaly Detection Algorithm I.N. Figueiredo, M. Dodangeh, L. Pinto, P.N.Figueiredo, R. Tsai	11:00 – 11:15	Lower limb joint angle coordination assessment at sagittal plane on human vertical countermovement C Rodrigues, MV Correia, JMCS Abrantes, J Nadal, MAB Rodrigues
11:15 – 11:30	Ultrasound Speckle Noise Reduction by Radio-frequency Data Filtering V. Santo, F.C. Monteiro	11:15 – 11:30	Validation of whole-body COM movement from 3D anthropometric image with dynamic data at different human standard MVJ C Rodrigues, MV Correia, JMCS Abrantes, J Nadal, MAB Rodrigues
11:30 – 11:45	A semi-automatic software for processing real-time phase-contrast MRI data S. Fall, P. Liu, O. Baledent	11:30 – 11:45	Immersive Multiple Object Tracking using Virtual Reality - Pilot study on athletes and non sport-practicing subjects A. Kibleur, M.L. Chénéchal, N. Benguigui, J. Chatel-Goldman
11:45 – 12:00	Comparative Study of Dermoscopic Hair Removal Methods L. Talavera-Martínez, P. Bibiloni, M. González-Hidalgo	11:45 – 12:00	Benchmark RGB-D Gait Datasets: A Systematic Review J.F. Nunes, P.M. Moreira, J.M.R.S. Tavares
12:00 – 12:15	Biometric Identification based on Forearm Vein Pattern R.S. Choras	12:00 – 12:15	GRIDDS - A Gait Recognition Image and Depth Dataset J.F. Nunes, P.M. Moreira, J.M.R.S. Tavares
12:15 – 12:30	A Hermite-based Method for Bone SPECT/CT Image Fusion with Prior Segmentation L. Barba-J, L. Vargas-Quintero, J.A. Calderon, C.T. Moreno	12:15 – 12:30	Using Augmented Reality in Patients with Autism: A Systematic Review A. Marto, H. Almeida, A. Gonçalves

12:30 – 14:00

Lunch

14:00 – 14:45

Keynotes II

Room I

*Patient specific, image based biomechanical models contribute to improved planning in total knee arthroplasty*  
**Jos Vander Sloten**

14:45 – 16:30

Oral Presentations

Room I		Room II	
Chairpersons:	ORAL III	Chairpersons:	ORAL IV
<i>Inês Domingues, Ryszard Choras</i>		<i>João Paulo Papa, Alberto Vergani</i>	
14:45 – 15:00	Automatic Segmentation and Delineation of Intervertebral Discs on Lumbar Spine MR Images W.T. Liu, A.R.S. Marcal	14:45 – 15:00	Image Based Search Engine - Like Using Color and Shape Features S. Irianto, D. Yuliawati, S. Karnila
15:00 – 15:15	Layer thickness evaluation between medical imaging and additive manufacturing H.A. Almeida, J. Vasco, M. Correia, R. Ruben	15:00 – 15:15	JADE-based Feature Selection for Non-Technical Losses Detection C.R. Pereira, L.A. Passos, D. Rodrigues, A.N. Souza, J.P. Papa
15:15 – 15:30	Cross Recurrence Quantitative Analysis of Functional Magnetic Resonance Imaging A. Lombardi, E. Lella, D. Diacono, N. Amoroso, A. Monaco, R. Bellotti, S. Tangaro	15:15 – 15:30	A Hybrid Approach For Breast Mass Categorization L.A. Passos, C. Santos, C.R. Pereira, L.C.S. Afonso, J.P. Papa
15:30 – 15:45	Craniofacial morphology of double reed instrument players and musical performance M.P. Clemente, J. Mendes, A. Moreira, A.P. Ferreira, J.M. Amarante	15:30 – 15:45	Comparison of validity indexes for fuzzy clusters of fMRI data S. Martinelli, A.A. Vergani, E. Binaghi
15:45 – 16:00	Mimetic Finite Difference Methods for Restoration of Fundus Images for Automatic Glaucoma Detection L. Bautista, J. Villamizar, G. Calderón, J.C. Carrillo E., J. Rueda, J. Castillo	15:45 – 16:00	Evaluation of CNN-based human pose estimation for body segment lengths assessment S. Vafadar, L. Gajny, M. Boëssé, W. Skalli
16:00 – 16:15	Space-adaptive anisotropic bivariate Laplacian regularization for image restoration L. Calatroni, A. Lanza, M. Pragliola, F. Sgallari	16:00 – 16:15	Skin Disease Diagnosis from Photographs Using Deep Learning E. Gocer
16:15 – 16:30	Bone SPECT image segmentation based on the Hermite transform L. Vargas-Quintero, L. Barba-J, J.A. Calderon, C.T. Moreno	16:15 – 16:30	White Matter, Gray Matter and Cerebrospinal Fluid Segmentation from Brain 3D MRI using B-UNET T.A. Tuan, P.T. Bao, J.Y. Kim, J.R.S. Tavares

16:30 – 17:00

Coffee Break

17:00 – 18:00

Oral Presentations

Room I Thematic Sessions on Cardiovascular, Cerebrovascular and Orthopaedic diseases Imaging and Modelling		Room II Thematic Sessions on Advances and Imaging Challenges in Micro and Nanofluidics	
<b>Chairpersons:</b> Sónia I.S. Pinto, Luísa C. Sousa, Catarina F. Castro	<b>ORAL V</b>	<b>Chairpersons:</b> Susana Catarino, Rui A. Lima, Graça Minas	<b>ORAL VI</b>
<b>17:00 – 17:15</b>	<i>Analysis of Sequential Transverse B-mode Ultrasound Images of the Carotid Artery Bifurcation</i> R. Fitas, C.F. Castro, L.C. Sousa, C.C. António, R. Santos, E. Azevedo	<b>17:00 – 17:15</b>	<i>Blood flow of bubbles moving in microchannels with bifurcations</i> D. Bento, S. Lopes, I. Maia, A. I. Pereira, C. S. Fernandes, J. M. Miranda, R. Lima
<b>17:15 – 17:30</b>	<i>Geometry reconstruction of a patient-specific right coronary artery with atherosclerotic plaque for CFD study</i> I.S. Saraiva, C.F. Castro, C.C. António, R. Ladeiras-Lopes, N.D. Ferreira, N. Bettencourt, L.C. Sousa, S.I.S. Pinto	<b>17:15 – 17:30</b>	<i>Red blood cells separation in a curved T-shaped microchannel fabricated by a micromilling technique</i> M. Madureira, V. Faustino, H. Schütte, D. Pinho, G. Minas, S. Gassmann, R. Lima
<b>17:30 – 17:45</b>	<i>Towards a "Surgical GPS": Combining Surgical Ontologies with Physician-Designated Anatomical Landmarks</i> A. Tapp, J.E. Blatt, H.S. St-Clair, M.A. Audette	<b>17:30 – 17:45</b>	<i>Magnetic PDMS microparticles for biomedical and energy applications</i> R. Lima, E.J. Vega, V.F. Cardoso, G. Minas, J.M. Montanero
<b>17:45 – 18:00</b>	<i>A Statistical Shape Model Approach for Computing Left Ventricle Volume and Ejection Fraction using Multi-plane Ultrasound Images</i> D. Liu, I. Peck, S. Dangi, K.Q. Schwarz, C.A. Linte	<b>17:45 – 18:00</b>	<i>Combining Infrared Thermography and Computational Fluid Dynamics to optimize Whole Body Cryotherapy protocols</i> F. Bogard, S. Murer, B. Bouchet, F. Beaumont, G. Polidori

18:30

Welcome Port of Honour

# Thursday, October 17

9:00 – 9:45

Keynotes III

Room I

*Eye tracking and human computer interface*  
Daniela Iacoviello

09:45 – 10:30

Oral Presentations

Room I		Room II	
		Thematic Session on Computational vision and image processing applied to Dentistry - I	
<b>Chairpersons:</b> <i>Manuel González-Hidalgo, Lionel Gontard</i>	<b>ORAL VII</b>	<b>Chairpersons:</b> <i>André Correia, Nuno Rosa, Tiago Marques</i>	<b>ORAL VIII</b>
<b>09:45 – 10:00</b>	<i>Voxel-based computational tools help liver dosimetry calculations of multiple (external and internal) radiation therapies</i> P. Ferreira, F.P.M. Oliveira, R. Parafita, P.S. Girão, P.L. Correia, O. Pares, D.C. Costa	<b>09:45 – 10:00</b>	<i>Color changes of a polyolefin thermoplastic resin used for flexible partial dentures</i> M. Sampaio-Fernandes, J. Galhardo, S. Campos, S. Oliveira, J.C. Reis-Campos, M.H. Figueiral
<b>10:00 – 10:15</b>	<i>Detection and automatic deletion of staples in images of wound of abdominal surgery for m-Health applications</i> M. González-Hidalgo, G. Moyà-Alcover, M. Munar, P. Bibiloni, A. Craus-Miguel, X. González-Argenté, J.J. Segura-Sampedro	<b>10:00 – 10:15</b>	<i>Thermoplastic materials for infrastructures in prosthodontic rehabilitation: a review</i> M. Sampaio-Fernandes, S. Campos, J. Galhardo, S. Oliveira, J.C. Reis-Campos, M. H. Figueiral
<b>10:15 – 10:30</b>	<i>Reconstruction of a defective finger joint surface and development of an adapted external fixator</i> L. Risse, S.C. Woodcock, G. Kullmer, B. Schramm, H.A. Richard	<b>10:15 – 10:30</b>	<i>Photogrammetry technique for the 3D digital impression of multiple dental implants</i> L. Azevedo, P. Molinero-Mourelle, J.L. Antonaya-Martín, J. Río-Highsmith, A. Correia, M. Gómez-Polo

10:30 – 11:00

Coffee Break

11:00 – 12:30

Oral Presentations

Room I		Room II	
		Thematic Session on Computational vision and image processing applied to Dentistry - I	
<b>Chairpersons:</b> <i>Cristina Caridade, Luciano Oliveira</i>	<b>ORAL IX</b>	<b>Chairpersons:</b> <i>André Correia, Nuno Rosa, Tiago Marques</i>	<b>ORAL X</b>
<b>11:00 – 11:15</b>	<i>Toward an Affine Feature-based Registration Method for Ground Glass Lung Nodule Tracking</i> Y.K.B. Zikri, M. Helguera, N.D. Cahill, D. Shrier, C.A. Linte	<b>11:00 – 11:15</b>	<i>The Use of QR Code as an Identification Method in Complete Dentures</i> B. Valentim, C. Figueiredo, J. Andrade, C. Oliveira, A. Correia
<b>11:15 – 11:30</b>	<i>Computer Aided Effective Prediction of Complete Responders after Radiochemotherapy Based on Tumor Regression Grade Estimated by MR Imaging</i> C. Losquadro, S. Conforto, M. Schmid, G. Giunta, M. Rengo, D. Caruso, A. Laghi	<b>11:15 – 11:30</b>	<i>Intraoral scan and 3D analysis of periodontal plastic surgery outcomes</i> S. Ramos, T. Marques, N.M. Santos, M. Sousa, G. Fernandes, A. Correia
<b>11:30 – 11:45</b>	<i>Prediction of the Child's Head Growth in the First Year of Life</i> W. Wolanski, E. Kawlewska, D. Larysz, M. Gzik, J. Gorwa, R. Michnik	<b>11:30 – 11:45</b>	<i>The application of infrared thermography as a quantitative sensory measure of the DC/TMD</i> M.P. Clemente, C. Faria, F.A. Coutinho, J.G. Mendes, J..C. Pinto, J.M. Amarante
<b>11:45 – 12:00</b>	<i>Influence of mutual rotation of polarizing filters on light intensity measured with collagen fibres</i> M. Turčanová, M. Hrtoň, P. Dvořák, J. Burša	<b>11:45 – 12:00</b>	<i>Dimensions of the Dentogingival Unit in the Anterior Maxilla – A study with CBCT</i> D. Figueiredo, T. Marques, A. Correia
<b>12:00 – 12:15</b>	<i>A Tool for Building Multi-purpose and Multi-pose Synthetic Data Sets</i> M. Ruiz, J. Fontinele, R. Perrone, M. Santos, L. Oliveira	<b>12:00 – 12:15</b>	<i>3D Printed Splint – Clinical cases</i> B. Valentim, J. Andrade, C. Oliveira, T. Marques, P. Fonseca
<b>12:15 – 12:30</b>	<i>Alzheimer's disease and the volume of hippocampal subfields: Cluster Analysis using neuroimaging data</i> C.G.F. Pachí, L. Torralbo, J.F. Yamamoto		

12:30 – 14:00

Lunch

14:00 – 14:45

Keynotes IV

Room I

*Imaging guidance for fetal interventions*  
Francisco Vasconcelos

14:45 – 15:30

Oral Presentations

Room I		Room II	
<b>Chairpersons:</b> <i>Ana Gouveia, Wojciech Wolański</i>	<b>ORAL XI</b>	<b>Chairpersons:</b> <i>Evgin Gocer, Cristian Linte</i>	<b>ORAL XII</b>
<b>14:45 – 15:00</b>	<i>Automated spinal midline delineation on biplanar X-rays using Mask R-CNN</i> Z. Yang, W. Skalli, C. Vergari, E.D. Angelini, L. Gajny	<b>14:45 – 15:00</b>	<i>Automatic classification of pterygium-non pterygium images using Deep Learning</i> Y.P. Lopez, L.R. Aguilera
<b>15:00 – 15:15</b>	<i>Automatic measurement of the volume of brain ventricles in preterm infants from 3D ultrasound datasets</i> L.C. Gontard, J. Pizarro, I. Benavente-Fernández, S.P. Lubián-López	<b>15:00 – 15:15</b>	<i>Osseous fracture patterns: from CT to a plane representation</i> A. Luque-Luque, J.-R. Jiménez-Pérez, J. J. Jiménez-Delgado
<b>15:15 – 15:30</b>	<i>Breast skin temperature evaluation in lactating and non-lactating women by thermography: an exploratory study</i> A. Gouveia, L. Pires, N. Garcia, A. Barbosa, A. Jesus, N. Pombo, M. Soares, J. Martinez-de-Oliveira	<b>15:15 – 15:30</b>	<i>Automatic extraction of marbling measures using image analysis, for evaluation of beef quality</i> C.M.R. Caridade, C.D. Pereira, A.F. Pires, N.G. Marnotes, J.F. Viegas

15:30

Porto city guided tour

20:00

Farewell Dinner

# Friday, October 18

9:00 – 10:30

Keynotes V & VI

Room I

*Deep learning in retinal image analysis*

**Aurélio Campilho**

*Recent advances on medical-driven applications: case studies in computer-aided Barrett's esophagus and Parkinson's disease diagnosis*

**João Paulo Papa**

10:30 – 11:00

Coffee Break

11:00 – 12:45

Oral Presentations

Room I		Room II	
<b>Chairpersons:</b> <i>Luisa Sousa, Fethi Okyar</i>	<b>ORAL XIII</b>	<b>Chairpersons:</b> <i>H.A. Almeida, J.E. Ribeiro, R. Lima</i>	<b>ORAL XIV</b>
<b>11:00 – 11:15</b>	<i>Processing thermographic images for the pre diagnosis of breast cancer</i> D. Granadillo, Y. Morales, E. Benjumea, C. Torres	<b>11:00 – 11:15</b>	<i>Mechanical and Imaging Models-based Image Registration</i> K. Škardová, M. Rambašek, R. Chabiniok, M. Genet
<b>11:15 – 11:30</b>	<i>Perineal pressure in equestrians: application to pudendal neuralgia</i> S. Murer, G. Polidori, F. Bogard, F. Beaumont, É. Polidori, M. Kinne	<b>11:15 – 11:30</b>	<i>Manufacturing process of a brain aneurysm biomodel in PDMS using rapid prototyping</i> A. Souza, J. Ribeiro, R. Lima
<b>11:30 – 11:45</b>	<i>Influence of Transversal Resolution on Reconstructing Atherosclerotic Plaque Components</i> O. Lisický, A. Malá, J. Burša	<b>11:30 – 11:45</b>	<i>Red blood cells tracking and cell-free layer formation in a hyperbolic microchannel: a CFD model validation</i> M. Gracka, R. Lima, J.M. Miranda, Z. Ostrowski
<b>11:45 – 12:00</b>	<i>A semi-automatic parameter extraction process for modeling of lumbar vertebral body segments</i> O. Güldeniz, V. Karadağ, A. F. Okyar	<b>11:45 – 12:00</b>	<i>Numerical characterization of a hyperelastic material to shear stress</i> A.V. Souza, J.E. Ribeiro, F. Araújo
<b>12:00 – 12:15</b>	<i>3D-FEM Modeling of Iso-concentration Maps in Single Trabecula from Human Femur Head</i> F. Bini, A. Pica, S. Novelli, A. Marinozzi, F. Marinozzi	<b>12:00 – 12:15</b>	<i>Extracting clothing features for blind people using image processing and machine learning techniques: First Insights</i> D. Rocha, V. Carvalho, F. Soares, E. Oliveira
<b>12:15 – 12:30</b>	<i>Macroscopic fracturation of osseous models</i> F.D. Pérez Cano, J.J. Jiménez Delgado	<b>12:15 – 12:30</b>	<i>HARM - The Human Action Recognition Module</i> B. Fernandes, G. Alag, S. Kumar
<b>12:30 – 12:45</b>	<i>Minimally Invasive Transforaminal Lumbar Interbody Fusion Surgery at Level L5-S1</i> D.S. Fidalgo, B. Areias, L.C. Sousa, M. Parente, R.N. Jorge, H. Sousa, J.M. Goncalves	<b>12:30 – 12:45</b>	<i>Computational tools for accessing cell mechanical information within 3D in vitro angiogenesis</i> J. Barrasa-Fano, J.A. Sanz-Herrera, M.-M. Vaeyens, H.V. Oosterwyck

12:45 – 13:00

Closing

Room I

13:00 – 14:30

Lunch



# SOCIAL PROGRAMME

**Wednesday, October 16**

**18h30 – Welcome Port of Honour**

Axis Vermar Conference & Beach Hotel – Hotel bar

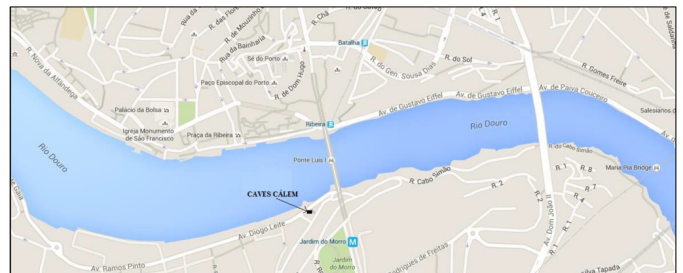


**Thursday, October 17**

**15h30 – Bus departure from Axis Vermar Conference & Beach Hotel**

**16h00 – Porto city guided tour**

**19h30 – Arrive to Caves Cálem, begin of the guided tour**

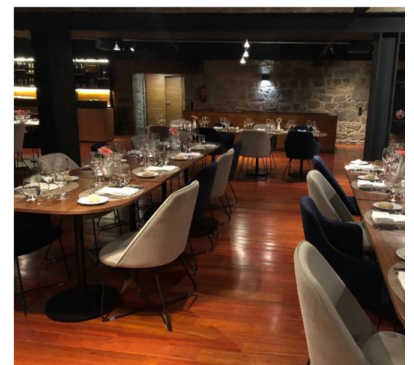
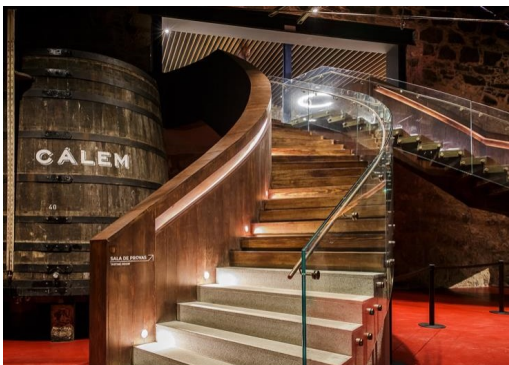


CAVES CÁLEM  
Avenida Diogo Leite, nº 344  
4400-111 Vila Nova de Gaia

GPS: N41.138195° ; W8.6190974°

**20h00 – Welcome Cocktail**

**20h30 – Dinner service**



**22h30 – Return to Axis Vermar Conference & Beach Hotel**

# Conference Venue

## Axis Vermar Conference & Beach Hotel

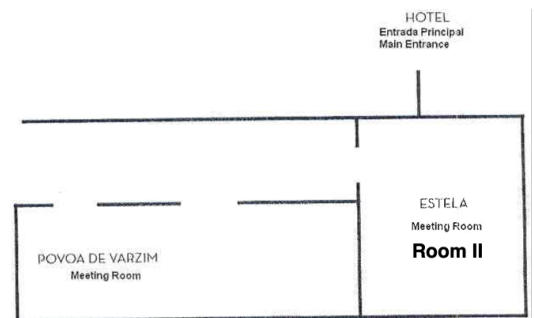
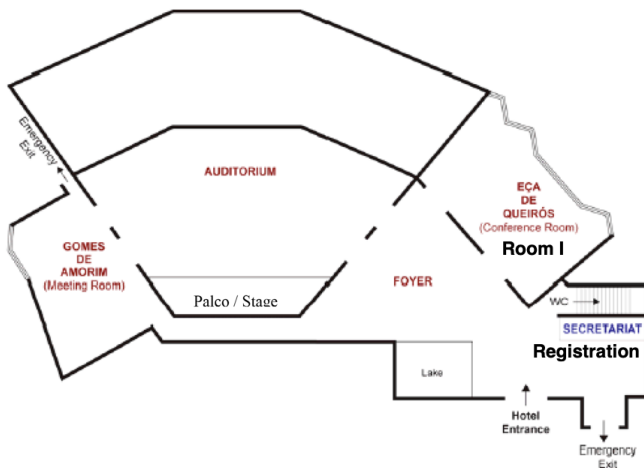
Rua da Imprensa Regional  
4490-518 Póvoa de Varzim  
PORTUGAL  
Tel.: +351 252 298 900

### GPS Coordinates

Latitude: 41° 23' 27.4482" N  
Longitude: -8° 46' 23.5194" W



# Conference Rooms



**Oral sessions:** Room I – “Eça de Queirós” & Room II – “Estela” room

**Coffee-breaks:** Hotel bar

**Lunches:** Hotel restaurant

# Wireless Internet

**Network ID:** Hotel Axis Vermar

**User:** axisvermar

**Password:** axisvermar



# Location

## PORTO CITY

Overlooking the Douro River, Porto is one of the most ancient European cities, It was born and developed from the northern bank of this river during the Middle Ages. One of the most significant aspects of Porto and its historical centre is its landscape, combining harmony with the urban structure and presenting a frame of rare beauty. The city was classified as World Heritage by UNESCO in 1996 and the Best destination in Europe in 2014.

When discovering Porto, you will find many surprises. Besides its welcoming and conservative environment, Porto is also contemporary and artistic. This is shown not only in the streets, architecture, monuments and museums but also in the terraces, restaurants and leisure and shopping areas.

## The people

Porto is proud to be known as the city of work. Actually, its inhabitants have always been in the front line to defend national causes and greatly contributed to the Discoveries as well as to the regions' economic development as one of the most dynamic areas in the country's entrepreneurial tissue. The roughness of hard work, however, is counter-balanced by the honest and hospitable spirit of its people. The dynamism of the Porto population reveals their passion for simple things, which gives them an authentic and respectable image.

## Useful Links

<http://visitporto.travel/Visitar/Paginas/default.aspx>

<https://www.visitportugal.com/en>

## Climate

Porto enjoys a very mild climate year-round.

Average Air Temperatures:



## Shopping

Traditional Commerce in the city centre is open everyday except on Sunday. The best shopping areas are Santa Catarina, 31 de Janeiro and Cedofeita streets, along with the narrow streets going up and down between the city centre and Ribeira (the riverside historical area).

Several shopping centres, in Porto and around it, are open everyday until 23h00. Besides the major international franchising and brands, national textiles, leather, pottery, shoes, crystal, wines and gold handcraft can be found in the shops at excellent value.

## Opening hours and timetables

Banks

Mon. to Fri. 8.30 - 15.00 (some until 18.00)

Shops

Mon. to Fri. 9.00 - 13.00 / 15.00 - 19.00, Sat. 9.00 - 13.00

Shopping Centres

Daily 10.00 - 23.00

## Restaurants

Prices round 10€ > 60€ per person

Lunch 12.00 - 15.00 / Dinner 19.30 - 23.00

Please click here to see a list of all restaurants in the city or visit the site

<http://visitporto.travel/Visitar/Paginas/default.aspx>

**Chemists**

Mon. to Fri. 9.00 - 13.00 / 15.00 - 19.00

Sat. 9.00 - 13.00

At night, Saturday afternoons and Sundays some chemists are open - call 118.

**Public services**

9.30 - 12.30 / 14.00 - 16.30 (some until 17.30)

**Post Offices**

Mon. to Fri. 8.30 - 18.00 / Airport - 24h a day

**Local time**

The local time in Porto is the Greenwich Time - the same as in London and one hour difference with the major European cities like Madrid, Rome, Paris, Brussels, etc.

**Currency**

The local currency is the Euro (€). Credit Cards - All major credit cards are accepted.

**Electricity**

220 V/ 50 Hz. - Location

**HOST CITY - PÓVOA DE VARZIM**

Póvoa de Varzim is a Portuguese city in Northern Portugal and a sub-region of Greater Porto. It sits in a sandy coastal plain, a cusped foreland, halfway between the Minho and Douro rivers. The population of the municipality was 63,408 at the time of the 2011 census. The city expanded, southwards, to Vila do Conde, and there are about 100,000 inhabitants in the urban area alone. It is the seventh largest urban agglomeration in Portugal and the third largest in Northern Portugal. Permanent settlement in Póvoa de Varzim dates back to around four to six thousand years ago; around 900 BC, unrest in the region led to the establishment of Cividade de Terroso, a fortified city, which developed maritime trade routes with the civilizations of Classical antiquity. Modern Póvoa de Varzim emerged after the conquest by the Roman Republic of the city by 138 BC, fishing and fish processing units soon developed, which turned out to be the foundations of the local economy. By the 11th century, the fish industry and fertile farmlands were the economic base of a feudal lordship and Varzim was fiercely disputed between the local overlords and the early Portuguese kings, which resulted in the establishment of the present day's municipality in 1308 and being subdued to monastic power some years later. Póvoa de Varzim's importance reemerged with the Age of Discovery due to its shipbuilders and merchants proficiency and wealth, who traded around the globe in complex trade routes. By the 17th century, the fish processing industry rebounded and, sometime later, Póvoa became the dominant fishing port in northern Portugal. Póvoa de Varzim has been a well-known beach resort for over three centuries, the most popular in Northern Portugal, which unfolded an influential literary culture and artistic patronage in music and theater. Póvoa de Varzim is one of the few legal gambling areas in Portugal, and has significant textile and food industries. The town has retained a distinct cultural identity and ancient customs such as the writing system of siglas poveiras, the masseira farming technique and festivals.

**Getting around Póvoa de Varzim**

Póvoa de Varzim is served by a transportation network that employs maritime, aerial and terrestrial travel. The terrestrial access infrastructure is composed of national motorways (freeways), the national roads system, and light rail metro. These infrastructures and the airport, bus terminal, marina and harbour are daily used by commuters.

Public transportation within the city is provided by private-owned companies. The Central de Camionagem is a terminus for urban and long distance buses that provide mass transit in the surrounding region, namely the city's countryside, Porto, Minho Region, and Galicia in Spain. Litoral

