# **PC 2011 15<sup>th</sup>** Panhellenic Conference on Informatics

# **30** Sep - 2 Oct 2011 Kastoria, Greece

# Program

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# PCI 2011 15<sup>th</sup> Panhellenic Conference on Informatics

# Program

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### Message form the General Chairs

### Dear Colleagues,

It is our great pleasure to welcome you to the 15<sup>th</sup> Panhellenic Conference on Informatics (PCI). The two co-organizing academic institutions are the Department of Informatics and Telecommunications Engineering of the University of Western Macedonia and the Department of Informatics and Computer Technology of the Technological Educational Institute of Western Macedonia, under the auspices of the Greek Computer Society (EPY), which has established it since 1984.

The 1<sup>st</sup> PCI took place in Athens (1984). Since then, the conference has journeyed through Thessaloniki (1988), Athens (1991), Patras (1993), Athens (1995), Athens (1997), Ioannina (1999), Nicosia (2001), Thessaloniki (2003), Volos (2005), Patras (2007), Samos (2008), Corfu (2009), and lately through Tripolis (2010). This year, the conference stops at Kastoria, hosted by the Department of Informatics and Computer Technology of the Technological Educational Institute of Western Macedonia. Thus, the Panhellenic Conference on Informatics serves as a key event for more than two decades offering the opportunity to the academic community, scientists and professionals in the areas of informatics to come together, present their work and exchange ideas.

A lot of effort has been spent for more than a year for the success of the conference. We would like to thank many committees and persons. In particular, first we would like to thank the authors for preparing and submitting their research work in the 15th PCI. Also, we would like to thank the Program Committee co-Chairs for their efforts to select the most interesting works for publication; and the Program Committee members for their effort to review all submitted papers and provide their rigorous comments, as well. In addition, thanks are due to the members of the Organizing Committee for handling the administrative and all financial details of the conference and the close cooperation we had together. Furthermore we would like to thank the Special Session organizers for their time and efforts in organizing these focused sessions in assorted modern topics. Last but not least special thanks are due to our keynote speakers for their significant contribution.

We hope that this volume will be used and referenced by the Greek research community for many years to come.

Yannis Manolopoulos, University of Western Macedonia Nikos Asimopoulos, Technological Educational Institute of Western Macedonia

### **Message form the Program Chairs**

This volume comprises the proceeding of the 15<sup>th</sup> Panhelenic Conference on Informatics with international participation (PCI 2011) which was held on September 30 till October 2, 2011 in Kastoria, Greece. A total of 108 high quality research papers were submitted in different areas of computer science. Following a strict and thorough peer review process, 70 papers were finally selected to be included in the current proceedings. We would like to thank the Program Committee members for their time and efforts to provide helpful and productive comments to all submitted papers. Their valuable feedback facilitated significantly the work of the Program Committee for the final selection of papers to be included in the proceedings.

Additionally, we are grateful to the organizers of special sessions that have addressed interesting research subjects. Five special sessions were included in the program: Free and Open Source Software (F/OSS) organized by Dr. Ioannis Stamelos and Dr. Konstantinos G. Margaritis; Mobile Device Software Development (MDSD) organized by Dr. Nikitas N. Karanikolas and Dr. Ioannis Voyiatzis; Performance analysis of Computer Networks (PaCoNet) organized by Dr. Vasileios Vitsas and Dr. Periklis Chatzimisios; Quality in Education Technologies (QET) organized by Dr. Michalis Xenos and Dr. Kiriakos Patriarcheas; and Real-World-Internet Special Session (RWI) organized by Dr. Panayotis Kikiras and Dr. Ioannis Chatzigiannakis.

The technical program includes interesting papers covering most fields of computer science, which have been classified to the following sessions:

- Information systems
- Databases and data mining
- Education Technologies
- · Algorithms and Data Structures
- Networking
- Open Source Software
- Multimedia Services
- e-services: Empirical studies
- Information Retrieval
- Numerical and Scientific Computations
- Human-Computer Interaction
- eCommerce, eBusiness, eGovernment, eHealth
- Mobile Device Software Development
- Quality in Educational Technologies
- Real-World-Internet

We hope that the technical sessions were stimulating and informative while offering you the opportunity to meet and share new ideas, approaches and methodologies. Finally, we would like to thank you for contributing to the success of PCI 2011.

Pantelis Angelidis, University of Western Macedonia

Angelos Michalas, Technological Educational Institute of Western Macedonia

### Conference Officers and Program Committee Members

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(continued)

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	Lazaros Markopoulos, Technological Educational Institute of Western Macedonia

### **Keynote Lectures**

### **Dr Paul G. Spirakis**

Paul Spirakis born in 1955, obtained his PhD from Harvard University, USA, in 1982. Has served as a postdoctoral researcher at Harvard University and as an assistant professor at New York University, (the Courant Institute). He was appointed as a Full Professor in the Department of Computer Science & Engineering of Patras University (Greece) in 1990. Paul Spirakis was honoured several times with international prizes and grants (e.g. NSF), also the top prize of the Greek Mathematics Society. Acknowledge between the top 50 scientists worldwide in Computer Science with respect "The Best Nurturers in Computer Science research", published by B. Kumar and N.Y. Srikant, ACM Data Mining, 2005. He was appointed as a Distinguished Visiting Scientist of Max Planck Informatik. Paul Spirakis is the Director of the Research Academic Computer Technology Institute (RA.CTI). His research interests include Algorithms and Complexity and interaction of Complexity and Game Theory. Paul Spirakis has extensively published in most of the important Computer Science Journals and most of the significant refereed conferences. He has edited various conference proceedings and is currently an Editor of Several Prestigious Journals. Paul Spirakis has published two books through Cambridge University Press, and eight books in Greek. Paul Spirakis was the Greek National Representative in the Information Society Research Programmes (IST) from January 1999 till June 2002. He was elected unanimously as one of the two vice-Presidents of the Council of the European Association for Theoretical Computer Science (EATCS). He has been a member of ISTAG (Information Society Technologies Advisory Group) a prestigious body of about 40 individuals advising EU for research policy, from January 2003 to January 2005. Paul Spirakis is, since Fall 2008, a member of the ACM Europe task force, which is now ACM Europe Council. Also, he is a member of the ERC/IDEAS Panel of evaluations for Computer Science (2009-2010). He consults for the Greek State, the European Union and several major Greek Computing Industries.

### **Population Protocols**

Friday, September 30 14.00 - 15.30

Wireless sensor networks are about to be part of everyday life. Mobility plays a central role in such systems and so does Passive Mobility, i.e. mobility of the network stemming from the environment itself. The Population protocol model was an intellectual invention aiming to describe such systems in a minimalistic and analysis-friendly way. In our talk, we describe recent advances in the population protocol model. These include the power added by memory enhancements in the devices, the role of fairness in pairwise interactions in the population, and the ability or limitations of such systems wrt global computations.

### **Dr Yannis Ioannidis**

Yannis Ioannidis is currently a Professor at the Department of Informatics and Telecommunications of the University of Athens. In early 2011 he also became the President and General Director of the ATHENA Research and Innovation Center; in addition, since April 2011, he serves as the Acting Director of the Institute of Language and Speech Processing of ATHENA. He received his Diploma in Electrical Engineering from the National Technical University of Athens in 1982, his MSc in Applied Mathematics from Harvard University in 1983, and his Ph.D. degree in Computer Science from the University of California-Berkeley in 1986. Immediately after that he joined the faculty of the Computer Sciences Department of the University of Wisconsin-Madison, where he became a Professor before finally leaving in 1999. His research interests include database and information systems, personalization and social networks, data infrastructures and digital libraries & repositories, scientific systems and workflows, eHealth systems, and human-computer interaction, topics on which he has published over one hundred articles in leading journals and conferences. He also holds three patents. Yannis loannidis is an ACM and IEEE Fellow (2004 and 2010, respectively) and a recipient of the VLDB "10-Year Best Paper Award" (2003), the "Presidential Young Investigator Award" - PYI (1991), and of several awards for teaching excellence, including the nation-wide "Xanthopoulos-Pneumatikos Award for Outstanding Academic Teaching" in Greece (2006) and the "Chancellor's Award for Excellence in Teaching" at the University of Wisconsin (1996). He has also been a keynote or invited speaker in several conferences (NLDB'08, ICDE'07, ADBIS'06, CIKM'05, ICDT'03, WAIM'01, SSDBM'00, PDP'00, ECDL'98). Yannis loannidis has been a (co-)principal investigator in over thirty research projects funded by various government agencies (USA, Europe, Greece) or private industry. He is currently an Associate Editor of Information Systems and Journal of Digital Libraries and has been a member of the program committees of over sixty conferences, six times as (co-)chair (ICDE'09, ADBIS'07, EDBT'06, HDMS'03, VLDB'02, VDB'98, and SSDBM'97). He currently serves as the ACM SIGMOD Chair (July 2009-June 2013), following a 4-year term as Vice-Chair, and is or has been a member of several other executive bodies of professional organizations (VLDB Endowment, IEEE TCDE Executive Committee, EDBT Endowment) and Scientific Advisory Boards (Max Planck Institute for Informatics, Greek National Science & Technology Council, Information Technology advisor to the Greek Minister of Health).

### Profiling Attitudes for Personalized Information Provision

Saturday, October 1 09.15 - 10.45

PAROS is a generic system under design whose goal is to offer personalization, recommendation, and other adaptation services to information providing systems. In its heart lies a rich user model able to capture several diverse aspects of user behavior, interests, preferences, and other attitudes. The user model is instantiated with profiles of users, which constitute the metadata required on the users for such customized services to be available. They are obtained by analyzing and appropriately interpreting potentially arbitrary pieces of user-relevant information coming from diverse sources. These profiles are maintained by the system, updated incrementally as additional data on users becomes available, and used by a variety of information systems to adapt the functionality to the users' characteristics. This talk gives an overview of the field and discusses some of the key problems that need to be solved before such a system becomes a reality.

## **Program at a glance**

### Friday 30/09/11

12:30-14:00	Registration
14:00-15:30	Plenary Session 1 • Opening Ceremony Invited Speaker Dr Paul G. Spirakis
15:30-15:45	Coffee Break
15:45-17:45	Session 1: Information Systems Session 2: Computer and Communication Networks Session 3: Education Technologies
	Saturday 1/10/11
09:15-10:45	Plenary Session 2 • Invited Speaker Dr Yannis Ioannidis
10:45-11:00	- Coffee Break
11:00-12:30	Session 4: <b>Multimedia Services</b> Session 5: <b>Numerical and Scientific Computations</b> Session 6: <b>eCommerce, eBusiness, eGovernment, eHealth</b>
12:30-14:00	Lunch
14:00-15:30	Session 7: <b>Mobile Device Software Development</b> Session 8: <b>Quality in Educational Technologies</b> Session 9: <b>Real World Internet</b>
15:30-15:45	Guided tour of Kastoria
19:00-23:00	Dinner
	Sunday 2/10/11
	Sunday 2/10/11
09:15-10:45	Session 10: Algorithms, Data Structures, Information Retrieval Session 11: Databases and Data Mining Session 12: Wireless Networks
10:45-11:00	Coffee Break
11:00-12:30	Session 13: <b>Open Source Software</b> Session 14: <b>e-services: Empirical Studies</b> Session 15: <b>Human-Computer Interaction</b>
12:30-14:00	Lunch
14:00-15:30	Closing Ceremony • Best Paper Award

## **Detailed Program**

Friday 30/9/2011	
Registration	12:30-14:00
Plenary Session 1 Opening Ceremony Keynote Lecture 1	14:00-15:30
Dr Paul G. Spirakis Population Protocols	
COFFEE BREAK	15:30-15:45
Session 1 Information Systems	15:45-17:45
Towards an Integrated Teaching Environment for Parallel Programming Constantinos T. Delistavrou, Konstantinos G. Margaritis	
Using an Automated Speech Emotion Recognition Technique to Explore the Impact of Bullying on Pupils Social Life Theodoros Iliou, Georgios Paschalidis	
<b>ProMaSi - A PROject MAnagement SImulator</b> N. Petalidis, G. Grigoriadis, Al. Theodoridis, An. Chronakis	
Teaching SPM through Management Antipatterns Ioannis Stamelos, Dimitrios Settas, Despoina Mallini	
Academic Research Policy-making and Evaluation Using Graph Visualisation Anastasios Tsolakidis, Cleo Sgouropoulou, Ioannis Xydas, Olivier Terraz, Georgios Miaoulis	

### **Computer and Communication Networks**

An Experimental Study of the Efficiency of Explicit Congestion Notification Stefanos Harhalakis, Nikolaos Samaras, Vasileios Vitsas

A Novel Probabilistic Flooding Strategy for Unstructured Peer-to-Peer Networks Spiridoula Margariti, Vassilios Dimakopoulos

Optimal Tradeoff between Energy Consumption and Response Time in Large-scale MapReduce Clusters Pavlos Paraskevopoulos, Anastasios Gounaris

Applying Categorical Logic on a Holistic Security Architecture across Distributed Systems Dimitrios Sisiaridis, Nick Rossiter

Handling Multicast Video over non Multicast Networks Michail Tolkas, Michail Bletsas, Pantelis Angelidis

#### Session 3

### **Education Technologies**

**Pilot Introduction of IWB and COWs in Greek Schools** *Fragkiskos Foskolos, Aristides Vagelatos, Theodoros Komninos* 

Virtual Learning Environments - An Overview Katerina Georgouli

**Exploiting Web Conferencing to Support Collaborative Learning** Apostolos Mavridis, Thrasyvoulos Tsiatsos, Stergios Tegos

A Hacker's Perspective on Educating Future Security Experts Alexandros Papanikolaou, Vassilios Karakoidas, Vasileios Vlachos, Andreas Venieris, Christos Ilioudis, Georgios Zouganelis

MentorChat: Introducing a Configurable Conversational Agent as a Tool for Adaptive Online Collaboration Support Stergios Tegos, Stavros Demetriadis, Anastasios Karakostas

### Saturday 1/10/2011

Plenary Session 2 Keynote Lecture 2 Dr Yannis Ioannidis Profiling Attitudes for Personalized Information Provision	09:10-10:45
COFFEE BREAK	10:45-11:00
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Session 4 Multimedia Services	11:00-12:30
Use of Behavioral Synthesis to Implement a Cellular Neural Network for Image Processing Applications Michael Dossis, Dimitrios Amanatidis	
<b>Denoising of Binarized Byzantine Textual Images</b> N. Ntogas, D. Ventzas, M. Ventza	
Subjective and Objective Video Codec Evaluation Andreas Papadakis, Konstantinos Zachos	
A Personalized Audio Web Service Using MPEG-7 and MPEG-21 Standards Emmanouil Skondras, Malamati Louta, Panagiotis Sarigiannidis	
Session 5	11.00.10.00
Numerical and Scientific Computations	11:00-12:30
<b>Design and Implementation of OpenMP Tasks in the OMPi Compiler</b> Spiros N. Agathos, Panagiotis E. Hadjidoukas, Vassilios V. Dimakopoulos	
Higher Order Finite Difference Preconditioned Scheme: A Multithreaded Approach C.K. Filelis-Papadopoulos, G.A. Gravvanis, E.A. Lipitakis	
Elastic Component Characterization with Respect to Quality Properties: An Intuitionistic Fuzzy-based Approach George Kakarontzas, Vassilis C. Gerogiannis, Ioannis Stamelos, Panagiotis Katsaros	
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## A Note on Parallel Finite Element Approximate Inverses Using OpenMP on Multicore Systems

P.I. Matskanidis, G.A. Gravvanis, K.M. Giannoutakis

Session 6	11.00.12.20
eCommerce, eBusiness, eGovernment, eHealth	11:00-12:30
Information Systems and Innovation in Greek Firms – An Empirical Investigation Sp. Arvanitis, E. Loukis, V. Diamantopoulou	
The Military Model in IT and Computer Studies: a Violation against Women's Rights in Work and Education Dionisis Georgopoulos	
<b>Seismicity Online Grid Map for Regional Earthquake Activity Studies</b> Athanasios Keskempes, Anthony Roussos, Nikos Tselikas, Anthony C. Boucouvalas	
<b>Promoting e-gov Services: e-Document Interoperability across EU</b> A. Papadakis, K. Rantos, Antonis Stasis	
Inter-viewing the Amazon Web Salespersons: Trends, Complementarities and Competition Michalis Vafopoulos, Thomas Theodoridis, Dimitris Kontokostas	
LUNCH	12:30-14:00
Session 7 Mobile Device Software Development	14:00-15:30
Education and Learning in the Semantic Web Anna Kasimati, Efpraxia Zamani	
A Mobile Application Supporting Conference Attendees and Organisers Chris D. Kounavis, Efpraxia D. Zamani, George M. Giaglis	
Implementing an Open Personal Learning Environment Alexandros Soumplis, Eleni Chatzidaki, Eleni Koulocheri, Michalis Xenos	

### **Quality in Educational Technologies**

Developing an Information System for Quality Assurance in Higher Education Using the Balanced Scorecard Technique - The case study of TEI-A Manos Chalaris, Anastasios Tsolakidis, Cleo Sqouropoulou, Ioannis Chalaris

Analyzing the Fora: An Algorithms Combination for the Representation of Messages Kiriakos Patriarcheas, Spyiridon Papaloukas, Michalis Xenos

Touch Your Program with Hands Theodosios Sapounidis, Stavros Demetriadis

Effectiveness of a Framed Wiki-based Learning Activity in the Context of HCI Education Nikolaos Tselios, Panagiota Altanopoulou, Christos Katsanos

A combined Algorithm for LMS Usage Assessment Stavros Valsamidis, Sotirios Kontogiannis, Alexandros Karakos, Ioannis Kazanidis

#### Session 9

#### **Real World Internet**

**Cyber threats & Internet of Things (Invited)** Commodore Alexander E. Hillaris

### Unattended Surveillance Network for After-disaster Support in Public Transportations Sector

C. Alexakos, M. Georgoudakis, A. Kalogeras, F. Andritsos, I. Chatzigiannakis, P. Kostantinopoulos

**i-Protect: An Open Source Emergency Management Framework** Marie-Aurelie Nef, Ioannis Filippopoulos, Eleftherios Voumvourakis, Aggelos Aggelis, Leonidas Perlepes, Georgios Stamoulis, Panayotis Kikiras

Wireless Sensor Network for Precision Agriculture Tagarakis, A., Liakos, V., Perlepes, L., Fountas S., Gemtos, T.

PatrasSense: Participatory Monitoring of Environmental Conditions in Urban Areas Using Sensor Networks and Smartphones Pantelis Vikatos, Evangelos Theodoridis, Georgios Mylonas, Athanasios Tsakalidis

### Guided tour of Kastoria

Dinner

14:00-15:30

15-45:17:45

19:00-23:00

### Sunday 2/10/2011

#### Session 10

### **Real World Internet**

**Splaying for Compression: An Experimental Study** Dimitris Antoniou, Ioannis Kampouris, Evangelos Theodoridis, Athanasios Tsakalidis

Search Culture Nikitas N. Karanikolas

A Performance Evaluation of Multiple Keyword Matching Algorithms for Different Types of Data Charalampos S. Kouzinopoulos, Konstantinos G. Margaritis

**Dynamic Dominators in Practice** *Konstantinos Patakakis, Loukas Georgiadis, and Vasileios A. Tatsis* 

### A Framework for Linked Data Business Models

Michalis Vafopoulos

### Session 11

### **Databases and Data Mining**

A Comparable Study Employing WEKA Clustering/Classification Algorithms for Web Page Classification Ioannis Charalampopoulos, Ioannis Anagnostopoulos

The Effects of Dimensionality Curse in High Dimensional kNN Search Nikolaos Kouiroukidis, Georgios Evangelidis

**Incremental Discovery of Top-k Correlative Subgraphs** *Georgia S. Latsiou, Apostolos N. Papadopoulos* 

Data Node Splitting Policies for Improved Range Query Efficiency in k-dimensional Point Data Indexes Evangelos Outsios, Georgios Evangelidis

**Nearest Neighbor Algorithms Using xBR-Trees** George Roumelis, Michael Vassilakopoulos, Antonio Corral 09:15-10:45

09:15-10:45

### **Wireless Networks**

## Collaborative Efforts for Safety and Security in Vehicular Communication Networks

George Kadas, Periklis Chatzimisios

Real-life Paradigms of Wireless Network Security Attacks I.P. Mavridis, A.-I. E. Androulakis, A.B. Halkias, Ph. Mylonas

### Supporting Service Differentiation in Wireless Sensor Networks

Marie-Aurelie Nef, Sophia Karagiorgou, George I. Stamoulis, Panayotis K. Kikiras

An Automated System for Integrated Service Management in Emergency Situations Nikolaos A. Pantazis, Stefanos A. Nikolidakis, Dionisis Kandris, Dimitrios D. Veraados

On Effectively Determining the Downlink-to-uplink Sub-frame Width Ratio for Mobile WiMAX Networks Using Spline Extrapolation Panagiotis Sarigiannidis, Malamati Louta, Angelos Michalas

COFFEE BREAK	10:45-11:00
Session 13	11:00-12:30
Open Source Software	
Towards Open Source Software System Architecture Recovery Using Design Metrics Eleni Constantinou, George Kakarontzas, Ioannis Stamelos	
Snmp for ETHernet Networks SETH - A Network Benchmark Toolkit for Managing Routers Statistical Information Sotirios Kontogiannis, Alexandros Karakos, George Kokkonis, Panagiotis Kitsos	
SFparser: A Tool for Selectively Parsing SourceForge Apostolos Kritikos, Fragkiskos Chatziasimidis	
Evaluation of Four, Free and Open Source DICOM Software Tools O. Papadopoulou	
e-AirQuality: A Dynamic Web Based Application for Evaluating the Air Quality Index for the City of Kozani, Hellas Ioannis Skordas, George Fragulis, Athanassios Triantafyllou	

10 15 11 00

### e-services: Empirical Studies

Log File Analysis of E-commerce Systems in Rich Internet Web 2.0 Applications *C. Aivalis A.C. Boucouvalas* 

A Comparison of Different Approaches over Focused Web Crawling Strategies Ioannis Avraam, Ioannis Anagnostopoulos

Teenagers' Use of Social Network Websites and Privacy Concerns: A Survey Evanthia Faliagka, Athanasios Tsakalidis, Danae Vaikousi

Social Multimedia Mining: A Social Informatics Perspective Georgios Lappas

### An Empirical Study on the Web Password Strength in Greece

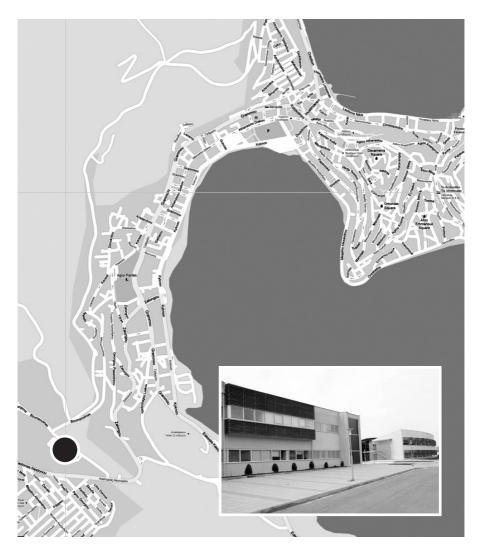
Artemios G. Voyiatzis, Christos A. Fidas, Dimitrios N. Serpanos, Nikolaos M. Avouris

Session 15	11.00 12.20
Human-Computer Interaction	11:00-12:30
Building a Platform-agnostic Wireless Network of Interconnected Smart Objects Orestis Akribopoulos, Vasileios Georgitzikis, Anastasia Protopapa, Ioannis Chatzigiannakis	
<b>The Concept and Design of an Open, Integrated Print Charging System</b> Michael Kalochristianakis, Kostas Grammatikakis, Manolis Saldaris, Irene Mastorakis, Grigoris Tzanodaskalakis	
Evaluation of Tip-activated and Push-button Infrared Pens for Interactive Whiteboards D. Kravvaris, E. Thanou, K. Chorianopoulos	
A Framework for Visualizing the Web of Data: Combining DBpedia and Open APIs A. Papantoniou, V. Loumos, M. Poulizos, G. Rigas	
eTracer: An Innovative Near-Real Time Track-and-Trace Platform Efi Papatheocharous, Panagiotis Gouvas, Andreas S. Andreou	
LUNCH	12:30-14:00

Closing Ceremony Best Paper Award

14:00-15:30

The Conference will take place in the premises of Kastoria Campus of TEI of Western Macedonia, Kastoria, Greece.







ΠΑΝΕΠΙΣΤΗΜΙΟ ΔΥΤΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΤΜΗΜΑ ΜΗΧΑΝΙΚΩΝ ΠΛΗΡΟΦΟΡΙΚΗΣ & ΤΗΛΕΠΙΚΟΙΝΩΝΙΩΝ



### http://pci2011.teiwm.gr/