3rd International Workshop on PErsonalization in eGOVernment and Smart Cities (PEGOV): Smart Services for Smart Territories

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1 Preface

User modeling and personalization have been playing an important role in the development of intelligent systems, whereby these systems adapt their behavior based on knowledge about users. Such knowledge can include users characteristics, interests and preferences, as well as locations or past behaviors. While personalization has been extensively studied and employed in domains characterized by the digital-object consumption (e-commerce, news, music, video recommendations, etc.), personalization in eGovernment applications is still in its infancy.

e-Government (e-Gov) has transformed interactions between governments, citizens and other stakeholders in the society. Public services and public sector information can now be delivered electronically through Web portals and mobile apps (e.g., see Palmonari et al., 2008, Loutas et al., 2011, Lee et al., 2011, Narducci et al., 2014). In this new context, citizens are the intended users of public services, thus innovative solutions better tailored to citizens' needs can facilitate access to e-Gov services and reduce the red tape that often characterizes the provisioning of public services (e.g., Bianco et al., 2013, Bista et al., 2013, Castelli et al., 2014). It can also enable more targeted information to be delivered to citizens (e.g., Colineau et al., 2013), or helps to overcome the language barrier for accessing to public services in different countries (Narducci et al., 2013). Finally, governments have also started to look at ways to better engage with citizens, both for service delivery and for policy making (e.g., Lee et al., 2011). As a result of these initiatives, providing personalized services, often grouped in life-events and business episodes, is a real possibility now for governments.

Another interesting development is the recent push towards more openness of public sector information, with an emphasis on opening up government data (Ojo et al., 2015), which presents new application areas and opportunities for personalization. This trend has specifically created the need for personalized access to Open Government Data predominantly by means of visualizations and faceted browsers. It has also given rise to opportunities for improved decision making (e.g., Lee et al., 2011), as well as recommendation and personalization of e-Gov services (e.g., Loutas et al., 2011, Baldassarre et al., 2013).

This introduces new challenges for personalization models. On the one hand, personalization can lead to better services and more relevant information. This is seen as desirable, by both the public and governments, as it can improve service delivery (e.g., Colineau et al., 2013, Iaquinta et al., 2013, Penadés et al., 2014, Torsello et al., 2014, Vicente-López et al., 2014) and participation to decision-making processes (e.g., Ardissono et al., 2013, Ardissono et al., 2014) . On the other hand, there are potentially ethical (including privacy) issues related to the fact that citizens might be in a dependence relationship with governments (e.g., Paris et al., 2013), and automatic user profiling might be considered big brother and not desirable.

Personalization in the e-Gov domain is still fairly novel at least in production systems, potentially because of the difficulties to obtain some of the information required for personalization, because of privacy, confidentiality, ethical and potentially trust reasons.

The main goal of this workshop is to stimulate the discussion around problems, challenges and research directions about personalization in e-Gov. This workshop builds on two previous PEGOV workshops at UMAP (2013 and 2014). This year, we extended the scope of PEGOV to Smart Cities, as these also provide new opportunities and new challenges (e.g., Villena-Román et al., 2014, Ojo et al., 2015). Smart Cities can have access to very detailed data about the citizens, e.g., using urban sensing devices, which can support new personalization models.

Improving the quality of both life and services in the city have high relevance in many research fields such as Social Sciences, Psychology, Education, Medicine, and Computer Science. For these reasons Smart Cities are becoming a very interesting topic for different conferences belonging to the ICT area. Different aspects are generally analyzed. For example, the Semantic Smart Cities was the subject of several recent workshops (the Semantic Cities workshop at AAAI 2012 and IJCAI 2013, the Semantic Smart City workshop at WIMS 2013, and the Smart Semantic Cities workshop at AI*IA 2014). Other events analyzed aspect such as the designing of Web Applications for Smart Cities (AW4CITY at WWW2015), or the Web Data Science at the service of Smart Cities (Web Data Science meets Smart Cities at WWW 2015). However, the personalization aspect for designing, implementing and delivering personalized services for new citizen-centered Smart Cities and Territories is not yet properly investigated in the literature.

The original topics of interest listed on the call for paper for the workshop included:

- Motivations, benefits, and issues of personalization in e-Gov and Smart Cities
- Approaches for the personalization of inclusive, personal and interactive services to citizens
- User and context awareness in personalization of services to the citizens
- Multilingual services to citizens
- Adaptation, personalization and recommendation models and goals in city services
- User, group and family modeling in e-Gov and Smart Cities
- Mining of user behavior, opinion mining, and sentiment analysis in e-Gov and Smart Citizens
- Gamification and Crowdsourcing for mining citizens profiles and opinions
- Services for personalized access to (Linked) Open Government Data
- Persistence, removal, and update of citizen profiles
- Semantic techniques for user profiling and personalization in e-Gov and Smart Cities
- Ethical issues, including privacy, in e-Gov and Smart Cities
- Usability of services to citizens
- Evaluation of personalized services in e-Gov and Smart Cities
- Applications of personalization methods in e-Gov and Smart Cities
- Communities and social networks in participatory e-Gov and Smart Cities
- Citizen-centered service design and modelling
- E-health and Smart Health

We accepted two short papers and one long paper. Each submission was reviewed by at least two PC members (none of the chairs has been involved in the review process). We are also pleased to have an invited speaker, Dr Edward Curry, the leader of the Green and Sustainable IT research group at Digital Enterprise Research Institute (DERI) in Ireland.

One paper proposes a personalization model for e-government, a personalized extended government model, to simplify and improve the effectiveness of e-government services. Another paper proposes a methodology for personalized cultural information. Finally, the third paper presents an environment for constraint-based recommender systems that could be use in e-government, for example as an online advisory service for citizens.

Edward Curry's invited talk is about *Open Data Innovation in Smart Cities: Challenges and Trends*. Open Data initiatives are increasingly considered as defining elements of emerging smart cities. However, few studies have attempted to provide a better understanding of the nature of this convergence and the impact on both domains. The talk examines the challenges and trends with open data initiatives using a socio-technical perspective of smart cities. The talk presents findings from a detailed study of 18 open data initiatives across five smart cities to identify emerging best practice. Three distinct waves of open data innovation for smart cities are discussed. The talk details the specific impacts of open data innovation on the different smart cities domains, governance of the

cities, and the nature of datasets available in the open data ecosystem within smart cities.

We hope the workshop will stimulate discussion around problems, challenges and research directions about personalization in governments and Smart Cities, with a specific focus on the design of personalized citizen-centered services and the challenges that must be addressed.

Some questions that motivate this workshop and that we hope we will be discussed during the workshop:

1. Can personalization methods support the design of services and applications, which better adapt to the different roles of citizens and companies?
2. Which user characteristics (demographic, cultural, family, etc.) can influence the design and delivery of personalized services for Smart Cities and Territories?
3. How can citizens be involved in the design of adaptive service platforms in different domains (e-gov, e-health, public services, etc.)?
4. Are the general techniques adopted for user modeling and profiling in different domains exploitable for modeling the citizen characteristics?
5. What services can be useful for a patient-empowered Smart Health?
6. How privacy and ethically issues affect the feasibility of effective personalization methods in the Smart Environments?
7. Can semantic models and ontologies support the representation of prototypical users in order to identify categories of citizens based on different characteristics?
8. How can service personalization decrease the costs for public administrations, increasing at the same time the value delivered to the citizen?
9. Would personalization methods be favorably accepted and desired by citizens?
10. How can ethical issues (big brother) and privacy influence the trust in personalized services?

This is an exciting field full of opportunities.

2   Workshop Chairs

Nikolaos Loutas, PwC, Belgium.
Nikolaos is manager at PwC's Technology Consulting practice, involved mainly in projects on interoperability of trans-European ICT solutions, data and software products. Nikolaos specialises in semantic aspects of interoperability, through the application of Semantic Web technologies and Linked Data. He has deep insights into open semantic standards, such as the Asset Description Metadata Schema, the e-Government Core Vocabularies and the DCAT Application Profile for data portals in Europe. Nikolaos is currently driving the Open Data Support project of DG CONNECT, which aims at facilitating the access of citizens and business to Open Government Data published by governments across Europe. Before joining PwC, Nikolaos had been working for leading EU research centers.

He has published more than 55 papers and reports in the field of Semantic Web in international journals, conferences and books.

Fedelucio Narducci, SWAP Research Group, University of Bari Aldo Moro, Italy
Fedelucio Narducci is research assistant at University of Bari Aldo Moro, Department of Computer Science. and member of the SWAP (Semantic Web Access and Personalization) research group. His primary research interests lie in the areas of machine learning, content-based recommender systems, user modeling, and personalization. From April 2012 he is working for the SMART (Services & Meta-services for smART eGovernment) project whose goal is to define models, methodologies, languages for planning, production and delivery of services characterized by optimal social value, value of use, and value of exchange. He served as Co-chair of Pegov 2013. Fedelucio was reviewer and co-reviewer for international conferences and journals on the topics of recommender system, user modeling and personalization. He is also author of several papers in international conferences and journals.

Adegboyega Ojo, INSIGHT Center for Data Analytics, National University of Ireland, Galway
Adegboyega Ojo is a Research Fellow and leads the E-Government Group at The INSIGHT Center for Data Analytics, National University of Ireland, Galway; Republic of Ireland. His research focuses on how to drive innovations in government organizations through the applications of Semantic Web, Linked Open Data and Collaboration technologies. His current portfolio of research and development projects is funded under the Seventh Framework Programme of the European Commission. Before his current role, he worked as Academic Program Officer, Research Fellow and Post-doctoral Fellow at the Center for Electronic Governance, United Nations University ? International Institute for Software Technology (UNU). At UNU, his work benefitted several governments including Macao, Korea, Mongolia, Colombia, Cameroon and Nigeria. He has published widely in the areas of Strategies, Architecture and Standards, e-Participation, Open Governance and Open Data. He obtained his PhD at the University of Lagos, Nigeria (1998), where he was appointed Senior Lecturer and Associate Professor in Computer Science in 2003 and 2012 respectively. He is also Adjunct Lecturer at the National University of Ireland, Galway.

Matteo Palmonari, University of Milano-Bicocca, Italy
Matteo Palmonari is an assistant professor in the Department of Informatics, Systems and Communication at the University of Milan-Bicocca. His research interests include semantic matchmaking, information quality, knowledge representation, and ontologies for the semantic web; several of his research have been applied to service modeling, service matchmaking and e-Government applications. He has been a visiting postdoc and a visiting assistant professor with the ADVIS Laboratory, University of Illinois at Chicago. He has published more than 40 papers in international journals and conferences.

Cécile Paris, CSIRO, Computational Informatics, Australia
Dr Cécile Paris is a Science Leader at CSIRO, Sydney, Australia, leading a re-

search group on Knowledge Discovery and Management. Dr Paris also holds Adjunct Professorships at Macquarie University (Sydney) and the ANU (Australian National University, Canberra, Australia). Dr Paris received her B.A. degree in Computer Science from The University of California at Berkeley, USA, and her Masters and PhD degrees from Columbia University, New York, USA. Her PhD was one User Modeling and Natural Language Generation. Her main research interests lie in the areas of personalized information delivery and language technology. She has been involved in e-Government for over 5 years, and her current work includes tailored delivery for Public Administration, online communities and social media in the context of e-Government. Dr Paris co-organised the workshop on Government and Citizen Engagement at the Communities and Technology conference in 2011. In 2011, she was an invited speaker at the 2nd (Australian) Public Officer Digital Media Forum, and at the 7th Annual AIMIA Digital Summit (AIMIA is the Australian Interactive Media Association). She was a keynote speaker at the (Australian) Emergency Management New and Emerging Technologies Forum in October 2013 and at the National Medicine Symposium in May 2014. Dr Paris has authored over 250 referred technical articles at international journals and conferences. She is currently the chair of CHISIG, the Computer Human Interaction Special Interest Group of the Human Factors and Ergonomics Society of Australia.

Giovanni Semeraro, SWAP Research Group, University of Bari Aldo Moro, Italy

He is associate professor of computer science at the University of Bari Aldo Moro and leads the Semantic Web Access and Personalization Research Group Antonio Bello. His research interests include AI, recommender systems, user modeling, personalization, intelligent information retrieval, semantic and social computing, the Semantic Web, natural language processing, and machine learning. He received his M.Sc. degree in computer science from the University of Bari. He served as General Co-chair of UMAP 2013, IIR 2013, SemExp 2012, IIR 2012, IIA 2008, AI*IA 2008, SWAP 2007, CILC 2006, and as Program Co-chair of RecSys 2015, IntRS@RecSys 2015 & 2014, DeCAT@UMAP 2015, PeGOV@UMAP 2014, Decisions@RecSys 2013 & 2012, DART 2013, 2012 & 2011, RSmeetDB@DEXA 2013 & 2012, SeRSy@RecSys 2013 & SeRSy@ISWC 2012, DEMRA@UMAP 2011, SPIM@ISWC 2011, EC-Web 2010, SWAP 2010, Web Mining 2.0@ECML/PKDD 2007, ISMIS 2006, WebMine@ECML/PKDD 2006, IEA-AIE 2005. He is co-author of more than 350 papers published in journals, international conferences and workshops.

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