

PEGOV 2014: 2nd International Workshop on Personalization in eGovernment Services and Applications

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1 Preface

User modeling and personalization have proved to play a strategic role in adapting the behavior of intelligent systems to the specific characteristics of their users. The systems exploiting user-profiling strategies are able to give a different answer to requests derived by different users. In this context, it is important to define effective and accurate techniques for extracting the users characteristics, interests and preferences to be used in the next steps of the personalization pipeline (adaptation, recommendation, etc.).

In parallel, e-Government (e-Gov) has, in recent times, 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. In this new context, innovative solutions that are better tailored to citizens' needs can facilitate better access to e-Gov services and reduce the red tape that usually characterizes the provisioning of public services. In addition, government and citizens can better engage with each other. Following these initiatives, governments are now looking at providing personalized services, often grouped in life-events and business episodes. Another interesting development related to governments is the recent push towards more openness of public sector information, with an emphasis on opening up government data, which presents new application areas and opportunities for personalization. This trend has specifically created the need for personalized access to Open Government Data (OGD) predominantly by means of visualizations and faceted browsers. It has also given rise to opportunities for improved decision making, as well as recommendation and personalization of e-Gov services.

Personalization methods and user modeling techniques have been applied successfully in several domains (e.g., e-commerce), and personalization is being extensively studied in domains characterized from the digital-object consumption (e-commerce, news, music, video recommendations, etc.). However, personalization in the e-Gov domain is still in its infancy, at least in production systems. One reason for this is the difficulty in the government domain to obtain some of the information required for personalization, due to personal data privacy and confidentiality constraints. For example, while in an e-commerce portal, one can quite easily obtain user preferences, in the e-Gov domain, the concept of preference itself is difficult to define, and confidentiality, ethical and privacy concerns play a more important role. Significant ethical issues could prevent governments from leveraging the direct access they have to citizen information, and undeclared or automatic user profiling could be considered intrusive and undesirable.

The main goal of this workshop is to stimulate the discussion around problems, challenges and research directions about personalization in e-Gov, with a dual focus on both services and OGD. Following up on the successful inaugural edition of the UMAP-PEGOV workshop of last year, we aim with this workshop to stimulate further interest of the scientific and business communities on the aforementioned issues to move towards more user-aware and adaptive services in the e-Gov domain by means of personalization methods. We are particularly interested in the role of user modeling and profiling in e-Gov service design and delivery, as well as in the provision and access to OGD, considering related issues like privacy, security and multilingualism. This workshop builds on other workshops concerned with e-Government and citizen engagement (cf: Gandrup Borchorst et al., 2011; Loutas et al., 2013).

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

- Motivation, benefits and roadblocks of personalization in e-Gov
- Recommender systems for integrated public sector information
- Approaches for the personalization of inclusive and interactive e-Gov services
- User and context awareness in personalization of e-Gov services
- Multilingual e-Gov services
- Adaptation, personalization and recommendation models and goals in e-Gov
- Personalized access to (Linked) Open Government Data (OGD)
- Visualization and faceted search for (Linked) OGD
- Big Data analytics for user profiling in e-Gov
- User, group and family modeling in e-Gov
- Mining of user behavior, opinion mining, and sentiment analysis in e-Gov
- User preference measurement and econometric indicators
- Applications for subjective well-being and happiness assessment
- Persistence, removal, and update of citizen profiles
- Semantic techniques for user profiling and personalization in e-Gov
- Ethical issues, including privacy, in e-Gov and OGD
- Usability of e-Gov applications, covering both services and OGD
- Evaluation of personalized services in e-Gov

- Applications of personalization methods in e-Gov
- Communities and social networks in participatory e-Gov
- Citizen-centered service design and modeling

⁴ We received 8 submissions; we accepted five long papers, two short papers and rejected one paper. Each submission was reviewed by at least two PC members (none of the chairs has been involved in the review process). Two of the accepted papers were ultimately withdrawn by their authors. These proceedings thus include four long papers and one short paper. The selected papers show the wide variety of topics and issues that arise in personalization for e-Government, from mining Twitter data to better understand the citizens to explicit crowd sourcing, to the personalization of the information space, documents and services, and, finally, the assessment of value of government services as perceived by citizens.

For several years now, social media, Twitter in particular, has been exploited to assist in a variety of government decisions, including: emergency management (e.g., Kireyev et al., 2009; Heinzelman and Waters 2010; Sakaki et al., 2012; Bruns et al., 2012; Cameron et al., 2012; Griffen et al., 2012; Yin et al., 2012; Karimi et al., 2013; Kreiner et al., 2013; Power et al., 2013); health-related matters (e.g., Leaman et al., 2010; Chee et al., 2011; Liu et al., 2011; Bian et al., 2012); and citizens engagement, i.e. or more generally to listening to citizens feedback to improve government services by and understanding citizens behaviours and concerns in order to improve government services by (e.g., Loutas et al., 2011; Paris and Wan, 2011; Loutas et al., 2012; Wan and Paris, 2014). In their paper, Villena-Román continue this trend to make use of social media to inform public entities. Their paper is entitled “TweetAlert: Semantic Analytics in Social Networks for Citizen Opinion Mining in the City of the Future”. It describes work done in the framework of the Ciudad 2020 Spanish national R&D project, specifically a system that aims to analyze tweets in real time, annotating them with information such as their topic and sentiment, and presenting them to an end user (such as a government agency employee) in a variety of visualisations.

While mining social media to obtain information about a number of topics related to citizens and government matters can already be seen as crowd sourcing, explicit crowd sourcing (i.e., actively asking citizens to contribute to a specific site with their comments) is being exploited by an increasing number of government agencies to manage participatory decision making (e.g., Public Sphere 2, 2009; Karamanou et al., 2011; Lee et al., 2011) and obtain information on various topics, such as road conditions (e.g., RAVC Pot Hole Patrol). Liliana Ardissono and her colleagues present a proposal for the management of 3D Community Maps which provide a virtual representation of a locality, also enabling users to contribute to policy making. Their paper, entitled “Community Mapping for Participatory decision-Making Processes” presents in particular an analysis of user requirements and personalization issues for this type of application. In particular, it suggests the selection of specific information from the community maps based on individual interests. This is of course the personalization of the information space for individual users, albeit in a specific context.

The personalization of information for individual users in the e-Government domain is further explored from two different perspectives: one of retrieval, following work such as (Chen and Sycara, 1998; Sugiyama et al., 2004; Gauch et al., 2007). In their paper entitled “Personalization of Parliamentary Document Retrieval using different user profiles”, Vicente-López and his colleagues performed a comparative study of several content-based user profile representations to support citizens’ access to the Records of Parliament Proceedings in Andalucía (Spain). They show that personalization helps citizens find information relevant for their needs. In a different line of research, based on the work on the production of personalized documents, where “one-size-fits-all is replaced by one document for one user, as in (Colineau et al, 2012a & b), Penadés and her colleagues propose a method that enables the generation of personalized documents in domains with high variability and with high levels of reuse. Their paper, “Product Line-based customization of e-Government documents” presents their approach (called Document Product Lines, or DPL), together with the principles that underlie it and a case study.

These proceedings finish with a paper by Torsello et al., entitled “A fuzzy model for service value assessment”. While it is assumed that personalization in e-government is beneficial to businesses and citizens (Baldassarre et al., 2013; Palmonari et al., 2008), to avoid information overload and ensure citizens receive the appropriate services with the least amount of effort, this proposition must to be verified. In particular, the personalization usually comes at a cost, for example the disclosure of information on the part of the citizen and the construction of a profile to be kept by government agencies. Some evaluations have already been performed (e.g., Colineau et al., 2012a). In their work, Torsello et al. present a model for the assessment of the service value of government services. As in other models which propose to balance costs and benefits (e.g., Paris et al., 2009), Torsello et al. define a service value as a trade-off between benefits and sacrifices, in this case as perceived by citizens according to their experiences using the services. Their model proposes the user of fuzzy concepts to reflect the fact that human perceptions are subjective.

We hope the workshop will stimulate discussions around the presented papers, the invited talk and the following questions:

1. How can personalization methods support the design of services and applications, which better adapt to the different roles that a citizen/business plays when interacting with public administrations?
2. Which user characteristics (demographic, cultural, family, etc.) can influence the design and delivery of e-Gov services as well as the access and reuse of OGD?
3. How can citizens be involved in the design of adaptive e-Gov platforms and services?
4. To what extent are the general techniques adopted for user modeling and profiling in different domains suitable for modeling the citizen characteristics?

5. Can semantic models and ontologies support the representation of prototypical users in order to identify categories of citizens based on different characteristics?
6. Can novel methods for socio-economic analysis based on mobile applications be used for driving the personalization of access to OGD and e-Gov services?
7. How can personalization methods improve the access to OGD, e.g., with proper visualizations, faceted browsers, and/or suitable recommendations?
8. Can semantic models and ontologies support the representation of prototypical users in order to identify categories of citizens based on different characteristics?
9. How can ethical issues and privacy be addressed to positively influence trust in personalized e-Gov services?
10. Would personalization methods be favorably accepted and desired by citizens?

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**, University of Milano-Bicocca, Italy. Swap Research Group, University of Bari Aldo Moro, Italy
Fedelucio Narducci is research assistant at University of Milan-Bicocca, Department of Informatics, Systems and Communication. He is also member of the SWAP (Semantic Web Access and Personalization) research group of University of Bari Aldo Moro. 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 the CSIRO Computational Informatics, Sydney, Australia. Dr Paris also holds Adjunct Professorships at Macquarie University (Sydney) and the ANU (Australian National University, Canberra, Australia). Dr Paris leads the research in Language and Social Media. 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 Me-

dia 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 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, Web-Mine@ECML/PKDD 2006, IEA-AIE 2005, He is co-author of more than 300 papers published in journals, international conferences and workshops.

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