

2011 IEEE International Conference on Web Services (ICWS 2011)

**Washington, DC, USA
4-9 July 2011**



**IEEE Catalog Number: CFP11CWS-PRT
ISBN: 978-1-4577-0842-8**

2011 IEEE International Conference on Web Services

ICWS 2011

Table of Contents

Message from the General Chairs.....	xvi
Message from the Program Chairs.....	xvii
Message from the Applications and Industry	
Track Chairs.....	xviii
Organizing Committee.....	xix
Program Committee.....	xxi
External Reviewers.....	xxiii
IEEE Computer Society Technical Committee on Services Computing.....	xxiv

RESEARCH TRACKS

Research Track 1: Multicast and Mobile Wireless Communication

Differential SOAP Multicasting	1
<i>Joe Tekli, Ernesto Damiani, and Richard Chbeir</i>	
Enhancing the Caching of Web Service Responses on Wireless Clients	9
<i>Apostolos Papageorgiou, Marius Schatke, Stefan Schulte, and Ralf Steinmetz</i>	
Opportunistic Composition of Sequentially-Connected Services in Mobile Computing Environments	17
<i>Christin Groba and Siobhán Clarke</i>	

Research Track 2: Security, Privacy, and Trust

Defending Web Services against Denial of Service Attacks Using Client Puzzles	25
<i>Suriadi Suriadi, Douglas Stebila, Andrew Clark, and Hua Liu</i>	
A Privacy-Preserving Approach for Web Service Selection and Provisioning	33
<i>Anna Squicciarini, Barbara Carminati, and Sushama Karumanchi</i>	

Finding K Optimal Social Trust Paths for the Selection of Trustworthy Service Providers in Complex Social Networks	41
<i>Guanfeng Liu, Yan Wang, and Mehmet A. Orgun</i>	

Research Track 3: Service Evolution

An Empirical Study on Web Service Evolution	49
<i>Marios Fokaefs, Rimon Mikhael, Nikolaos Tsantalis, Eleni Stroulia, and Alex Lau</i>	
LoST: Local State Transfer—An Architectural Style for the Distributed Enactment of Business Protocols	57
<i>Munindar P. Singh</i>	
Towards Privacy-Preserving XML Transformation	65
<i>Meiko Jensen and Florian Kerschbaum</i>	

Research Track 4: Automatic Service Composition

Dynamic Composition of Pervasive Process Fragments	73
<i>Adina Sirbu, Annapaola Marconi, Marco Pistore, Hanna Eberle, Frank Leymann, and Tobias Unger</i>	
Automatic Web Service Composition with a Heuristic-Based Search Algorithm	81
<i>Pablo Rodriguez-Mier, Manuel Mucientes, and Manuel Lama</i>	
QoS-Aware Automatic Service Composition by Applying Functional Clustering	89
<i>Florian Wagner, Fuyuki Ishikawa, and Shinichi Honiden</i>	

Research Track 5: Service Selection and Negotiation

Service Selection with Combinational Use of Functionally-Equivalent Services	97
<i>Nobuaki Hiratsuka, Fuyuki Ishikawa, and Shinichi Honiden</i>	
WebNeg: A Genetic Algorithm Based Approach for Service Negotiation	105
<i>Khayyam Hashmi, Amal Alhosban, Zaki Malik, and Brahim Medjahed</i>	
Combining Configuration and Query Rewriting for Web Service Composition	113
<i>Amin Mesmoudi, Michaël Mrissa, and Mohand-Saïd Hacid</i>	

Research Track 6: Business Process Management

A Multi-tenant Architecture for Business Process Executions	121
<i>Milinda Pathirage, Srinath Perera, Indika Kumara, and Sanjiva Weerawarana</i>	
Refactoring and Publishing WS-BPEL Processes to Obtain More Partners	129
<i>Wei Song, Xiaoxing Ma, S.C. Cheung, Hao Hu, Qiliang Yang, and Jian Lü</i>	
Modeling and Executing Business Processes with Annotated Security Requirements in the Cloud	137
<i>J. Damasceno, F. Lins, R. Medeiros, B. Silva, A. Souza, D. Aragão, P. Maciel, N. Rosa, B. Stephenson, and J. Li</i>	

Research Track 7: Service Evaluation and Analysis

A QoS-Aware Service Evaluation Method for Co-selecting a Shared Service	145
<i>Dou Wanchun, Lv Chao, Zhang Xuyun, and Jinjun Chen</i>	
Timed Web Services Analysis after Removing Complex Implicit Transitions	153
<i>Emad Elabd, Emmanuel Coquery, and Mohand-Said Hacid</i>	
Runtime Monitoring of Data-centric Temporal Properties for Web Services	161
<i>Guoquan Wu, Jun Wei, Chunyang Ye, Xiaozhe Shao, Hua Zhong, and Tao Huang</i>	

Research Track 8: Service Interoperability

Has WS-I's Work Resulted in Ws-* Interoperability?	171
<i>Andreas Schöenberger, Johannes Schwab, and Guido Wirtz</i>	
Retrieving Compatible Web Services	179
<i>Vasilios Andrikopoulos and Pierluigi Plebani</i>	
DIEGO: A Tool for Deriving choreography-conforming Web Service Systems	187
<i>Pablo Rabanal, José Antonio Mateo, Ismael Rodríguez, and Gregorio Díaz</i>	

Research Track 9: Service Ranking and Recommendation

Collaborative Filtering Based Service Ranking Using Invocation Histories	195
<i>Qiong Zhang, Chen Ding, and Chi-Hung Chi</i>	
A QoS-Based Fuzzy Model for Ranking Real World Web Services	203
<i>Mohamed Almulla, Kawthar Almatori, and Hamdi Yahyaoui</i>	
An Effective Web Service Recommendation Method Based on Personalized Collaborative Filtering	211
<i>Yechun Jiang, Jianxun Liu, Mingdong Tang, and Xiaoqing (Frank) Liu</i>	

Research Track 10: Efficient Service Composition

Semi-empirical Service Composition: A Clustering Based Approach	219
<i>Xianzhi Wang, Zhongjie Wang, and Xiaofei Xu</i>	
Efficient Multi-granularity Service Composition	227
<i>Lina Barakat, Simon Miles, Iman Poernomo, and Michael Luck</i>	
On the Optimal Petri Net Representation for Service Composition	235
<i>Yin Wang, Ahmed Nazeem, and Ram Swaminathan</i>	

Research Track 11: Semantic Services

Composing Data-Driven Service Mashups with Tag-Based Semantic Annotations	243
<i>Xuanzhe Liu, Qi Zhao, Gang Huang, Hong Mei, and Teng Teng</i>	
A Learning Ontology Method for RESTful Semantic Web Services	251
<i>Yong-Ju Lee and Chang-Su Kim</i>	
Personalizing Access to Semantic Web Services	259
<i>Freddy Lécué</i>	

Research Track 12: Service Composition Planning and Testing

Identifying Optimal Composite Services by Decomposing the Service Composition Problem	267
<i>Zachary J. Oster, Ganesh Ram Santhanam, and Samik Basu</i>	
A Transaction Management Model Based on Compensation Planning Graph for Web Services Composition	275
<i>Lizhen Cui, Zongmin Shang, and Yuliang Shi</i>	
Metamorphic Testing for Web Services: Framework and a Case Study	283
<i>Chang-ai Sun, Guan Wang, Baohong Mu, Huai Liu, ZhaoShun Wang, and T.Y. Chen</i>	
Automatic Sampling of Web Services	291
<i>Mohammed AbuJarour and Sebastian Oergel</i>	

APPLICATIONS AND EXPERIENCES TRACKS

Applications and Experiences Track 1: Process Management

Modelling Collaborative Services for Business and QoS Compliance	299
<i>Jinhui Yao, Shiping Chen, Chen Wang, David Levy, and John Zic</i>	
Verifying OWL-S Service Process Models	307
<i>Yuzhang Feng and Markus Kirchberg</i>	
An Automatic Approach for Extracting Process Knowledge from the Web	315
<i>Hua Xiao, Bipin Upadhyaya, Foutse Khomh, Ying Zou, Joanna Ng, and Alex Lau</i>	

Applications and Experiences Track 2: QoS-Based Services Composition

A Framework for Building Privacy-Conscious DaaS Service Mashups	323
<i>Mahmoud Barhamgi, Djamel Benslimane, Chirine Ghedira, Salah-Eddine Tbahriti, and Michael Mrissa</i>	
Composing Non-functional Concerns in Composite Web Services	331
<i>Benjamin Schmeling, Anis Charfi, and Mira Mezini</i>	
Adaptive Service Composition Based on Runtime Requirements Monitoring	339
<i>Zhanlei Ma, Lin Liu, Hongji Yang, and John Mylopoulos</i>	

Applications and Experiences Track 3: Semantic Services Composition

Inferring Data Flow in Semantic Web Service Composition	347
<i>Freddy Lécué</i>	
Web Service Composition Techniques in a Health Care Service Platform	355
<i>Pengwei Wang, Zhijun Ding, Changjun Jiang, and Mengchu Zhou</i>	

Applications and Experiences Track 4: Semantic Services Discovery

Taxonomic Clustering and Query Matching for Efficient Service Discovery	363
<i>Sourish Dasgupta, Satish Bhat, and Yugyung Lee</i>	
Toward Semantics Empowered Biomedical Web Services	371
<i>Jia Zhang, Ravi Madduri, Wei Tan, Kevin Deichl, John Alexander, and Ian Foster</i>	
A Hybrid Approach to Recommending Semantic Software Services	379
<i>Liwei Liu, Freddy Lecue, and Nikolay Mehandjiev</i>	

Applications and Experiences Track 5: Requirements-Based Services Discovery

Web Service Selection for Resolving Conflicting Service Requests	387
<i>Guosheng Kang, Jianxun Liu, Mingdong Tang, Xiaoqing (Frank) Liu, and Kenneth K. Fletcher</i>	
Selection of Composable Web Services Driven by User Requirements	395
<i>Zeina Azmeh, Maha Driss, Fady Hamoui, Marianne Huchard, Naouel Moha, and Chouki Tibermacine</i>	
AWSP: An Automatic Web Service Planner Based on Heuristic State Space Search	403
<i>Bin Wu, Shuiguang Deng, Ying Li, Jian Wu, and Jianwei Yin</i>	

Applications and Experiences Track 6: QoS-Based Services Discovery

Improving Web Service Discovery by a Functional and Structural Approach	411
<i>Rodrigo Amorim, Daniela Barreiro Claro, Denivaldo Lopes, Patrick Albers, and Aline Andrade</i>	
CoWS: An Internet-Enriched and Quality-Aware Web Services Search Engine	419
<i>Meng Li, Junfeng Zhao, Lijie Wang, Sibbo Cai, and Bing Xie</i>	
A QoS-Aware Web Service Selection Algorithm Based on Clustering	428
<i>Yi Xia, Ping Chen, Liang Bao, Meng Wang, and Jing Yang</i>	

Applications and Experiences Track 7: QoS-Based Services Composition

Efficient Heuristic Approach with Improved Time Complexity for QoS-Aware Service Composition	436
<i>Adrian Klein, Fuyuki Ishikawa, and Shinichi Honiden</i>	
Non-cooperative Game Based QoS-Aware Web Services Composition Approach for Concurrent Tasks	444
<i>Haifeng Li, Qing Zhu, and Yiqiang Ouyang</i>	
QoS-Aware Service Composition for Workflow-Based Data-Intensive Applications	452
<i>Yin Li and Chuang Lin</i>	

Applications and Experiences Track 8: Services Negotiation and Management

A Hierarchical Approach to Service Negotiation	460
<i>Glenn Bruns and Mauricio Cortes</i>	
Automated State-Space Exploration for Configuration Management of Service-Oriented Applications	468
<i>Mike Smit and Eleni Stroulia</i>	
Optimizing the Tradeoff between Discovery, Composition, and Execution Cost in Service Composition	476
<i>Immanuel Trummer and Boi Faltings</i>	

Applications and Experiences Track 9: Services Engineering

Regression Testing as a Service	484
<i>Sheng Huang, Zhong Jie Li, Ying Liu, Jun Zhu, Yang Hua Xiao, and Wei Wang</i>	

A Multi-layered Approach for the Declarative Development of Data Providing Services	492
<i>Kevin P. Brown and Miriam A.M. Capretz</i>	
Transaction Similarity-Based Contextual Trust Evaluation in E-Commerce and E-Service Environments	500
<i>Haibin Zhang, Yan Wang, and Xiuzhen Zhang</i>	

INDUSTRY TRACKS

Industry Track 1: Business Process Management

Design and Describe REST API without Violating REST: A Petri Net Based Approach	508
<i>Li Li and Wu Chou</i>	
Modeling Business Process of Web Services with an Extended STRIPS Operations to Detection Feature Interaction Problems Runtime	516
<i>Jiuyun Xu, Kun Chen, Youxiang Duan, and Stephan Reiff-Marganiec</i>	
Rule-Based Run-Time Information Flow Control in Service Cloud	524
<i>Wei She, I-Ling Yen, Bhavani Thuraisingham, and San-Yih Huang</i>	

Industry Track 2: QoS Management

Progressive Reliability Forecasting of Service-Oriented Software	532
<i>Andrew G. Liu, Ewa Musial, and Mei-Hwa Chen</i>	
On the Use of Fuzzy Dominance for Computing Service Skyline Based on QoS	540
<i>Karim Benouaret, Djamel Benslimane, and Allel Hadjali</i>	
On the Verification of Behavioral and Probabilistic Web Services Using Transformation	548
<i>Giti Oghabi, Jamal Bentahar, and Abdelghani Benharref</i>	

Industry Track 3: Services Engineering

A Service-Oriented Framework for Hybrid Immersive Web Applications	556
<i>Lijun Mei, Yimin Wang, Qicheng Li, Jian Wang, and Ziyu Zhu</i>	
A Dynamic Resource Allocation Algorithm for Database-as-a-Service	564
<i>Jie Zhu, Bo Gao, Zhihu Wang, Berthold Reinwald, Changjie Guo, Xiaoping Li, and Wei Sun</i>	
Long-Term Benefit Driven Adaptation in Service-Based Software Systems	572
<i>Jun Na, Bin Zhang, Yan Gao, Li Zhang, and Zhi-liang Zhu</i>	

Industry Track 4: Services Assurance

An Attribute Assurance Framework to Define and Match Trust in Identity Attributes	580
<i>Ivonne Thomas and Christoph Meinel</i>	
Fine-Grained Metrics of Cohesion Lack for Service Interfaces	588
<i>Dionysis Athanasopoulos and Apostolos V. Zarras</i>	

Industry Track 5: Service Security and Trust

Automated Security Service Orchestration for the Identity Management in Web Service Based Systems	596
<i>Robert Warschofsky, Michael Menzel, and Christoph Meinel</i>	
A Subjective Probability Based Deductive Approach to Global Trust Evaluation in Composite Services	604
<i>Lei Li and Yan Wang</i>	
Dynamic Identity Delegation Using Access Tokens in Federated Environments	612
<i>Hidehito Gomi</i>	

Industry Track 6: Services Monitoring and Testing

StreamWeb: Real-Time Web Monitoring with Stream Computing	620
<i>Toyotaro Suzumura and Tomoaki Oiki</i>	
An Event-Based Reasoning Approach to Web Services Monitoring	628
<i>Ehtesham Zahoor, Olivier Perrin, and Claude Godart</i>	
Test Case Prioritization for Audit Testing of Evolving Web Services Using Information Retrieval Techniques	636
<i>Cu D. Nguyen, Alessandro Marchetto, and Paolo Tonella</i>	

Industry Track 7: Multicast and Mobile Wireless Communication

Differential Caches for Web Services in Mobile Environments	644
<i>M.S. Qaiser, P. Bodorik, and D.N. Jutla</i>	
Providing Light Weight Distributed Web Services from Mobile Hosts	652
<i>Feda AlShahwan, Klaus Moessner, and Francois Carrez</i>	
WS-Eventing SOAP-over-UDP Multicast Extension	660
<i>David Gregorczyk</i>	

Industry Track 8: Service Composition

A History Record-Based Service Optimization Method for QoS-Aware Service Composition	666
<i>Lin Wenmin, Dou Wanchun, Luo Xiangfeng, and Jinjun Chen</i>	
Identification of Semistructured Abstract Nonfunctional Properties for Automatic Service Composition	674
<i>Incheon Paik, Wuhui Chen, and Ryohei Komiya</i>	
A Policy-Based Framework for Automated Service Level Agreement Negotiation	682
<i>Zan Xiao, Donggang Cao, Chao You, and Hong Mei</i>	

WORK-IN-PROGRESS TRACKS

Work-in-Progress Track 1: Service Communities and Privacy

Implementation of Communities of Web Service Registries	690
<i>Mohamed Sellami, Walid Gaaloul, and Samir Tata</i>	
Aggregated Privacy-Preserving Identity Verification for Composite Web Services	692
<i>Nan Guo, Tianhan Gao, Bin Zhang, Ruchith Fernando, and Elisa Bertino</i>	
Privacy Preserving Personalized Access Control Service at Third Service Provider	694
<i>Xiuxia Tian, Chaofeng Sha, Xiaoling Wang, and Aoying Zhou</i>	
Apply WS-Management to Manage Real Resources: MAPE Use Case Study	696
<i>ZhiHui Lu, Jie Wu, and WeiMing Fu</i>	
CLAM: Cross-Layer Management of Adaptation Decisions for Service-Based Applications	698
<i>Asli Zengin, Raman Kazhamiakin, and Marco Pistore</i>	
Social-Based Web Services Discovery and Composition for Step-by-Step Mashup Completion	700
<i>Abderrahmane Maaradji, Hakim Hacid, Ryan Skraba, Adnan Lateef, Johann Daigremont, and Noël Crespi</i>	

Work-in-Progress Track 2: Service Recommendations and Reputation

NRCF: A Novel Collaborative Filtering Method for Service Recommendation	702
<i>Huifeng Sun, Zibin Zheng, Junliang Chen, and Michael R. Lyu</i>	
Reputation-Driven Web Service Selection Based on Collaboration Network	704
<i>Xilu Zhu, Bai Wang, and Shangguang Wang</i>	
Web Services Discovery and Composition: A Schema Matching Approach	706
<i>Sana Sellami and Omar Boucelma</i>	
Data-Dependency Aware Trust Evaluation for Service Choreography	708
<i>Longtao Huang, Shuiguang Deng, Ying Li, Jian Wu, and Jianwei Yin</i>	
A Formal Model of Service Computing and Its Applications on Service Discovery	710
<i>Yingzhou Zhang, Wei Fu, Lei Chen, and Bihuan Xu</i>	

Work-in-Progress Track 3: Semantic Services and Integration

Ontology-Driven Query Expansion Using Map/Reduce Framework to Facilitate Federated Queries	712
<i>Neda Alipanah, Pallabi Parveen, Latifur Khan, and Bhavani Thuraisingham</i>	
Generating Workflow Models from OWL-S Service Descriptions with a Partial-Order Plan Construction	714
<i>Bochao Wang, Armin Haller, and Florian Rosenberg</i>	
Constructing Operation-Level Ontologies for Web Services	716
<i>Xumin Liu and Hua Liu</i>	
A Petri Net Based Hybrid Optimal Controller for Deadlock Prevention in Web Service Composition	718
<i>Jing Bi, Zhiliang Zhu, Haitao Yuan, Yushun Fan, and Ming Tie</i>	
An Event-Based Functionality Integration Framework	720
<i>Zhenzhen Zhao, Sirsha Bhattarai, and Noel Crespi</i>	
Conformance Verification between Web Service Choreography and Implementation Using Learning and Model Checking	722
<i>Warawoot Pacharoen, Toshiaki Aoki, Athasit Surarerks, and Pattarasinee Bhattarakosol</i>	
A Framework for Ontology Evolution Management in SSOA-Based Systems	724
<i>Soumaya Slimani, Salah Baïna, and Karim Baïna</i>	

Work-in-Progress Track 4: Context-Aware and Mobile Wireless Services

A New QoS Prediction Approach Based on User Clustering and Regression Algorithms	726
<i>Yuliang Shi, Kun Zhang, Bing Liu, and Lizhen Cui</i>	
On-the-Fly Detection Approach of Control Dependency Deadlocks in BPEL	728
<i>Deng Na, Li Desheng, Li Changbao, Chen Junliang, and Liu Chuanchang</i>	
An Abstract Transaction Model for Testing the Web Services Transactions	730
<i>Rubén Casado, Javier Tuya, and Muhammad Younas</i>	
CloudDB AutoAdmin: Towards a Truly Elastic Cloud-Based Data Store	732
<i>Sherif Sakr, Liang Zhao, Hiroshi Wada, and Anna Liu</i>	
A Web Service Performance Evaluation Approach Based on Users Experience	734
<i>Changbao Li, Bo Cheng, Junliang Chen, Pingli Gu, Na Deng, and Desheng Li</i>	
Predicting Software Service Availability: Towards a Runtime Monitoring Approach	736
<i>Davide Lorenzoli and George Spanoudakis</i>	

Work-in-Progress Track 5: Quality of Service Analysis and Control

Mobility-Aware Selection of Mobile Web Services	738
<i>M. Adel Serhani and Abdelghani Benharref</i>	
An Event Driven Model for Context-Aware Service	740
<i>Tong Mo, Weiping Li, Weijie Chu, and Zhonghai Wu</i>	
A Comprehensive Device Collaboration Model for Integrating Devices with Web Services under Internet of Things	742
<i>Feng Chen, Changrui Ren, Jin Dong, Qinhua Wang, Jinfeng Li, and Bing Shao</i>	
Improving Web API Discovery by Leveraging Social Information	744
<i>Romina Torres, Boris Tapia, and Hernán Astudillo</i>	
Service Evolution Management Based on Usage Profile	746
<i>Marcelo Yamashita, Karin Becker, and Renata Galante</i>	
Multiple Representations of Web Services: Discovery, Clustering and Recommendation	748
<i>Mustapha Aznag, Mohamed Quafafou, Nicolas Durang, and Zahi Jarir</i>	
Author Index	750