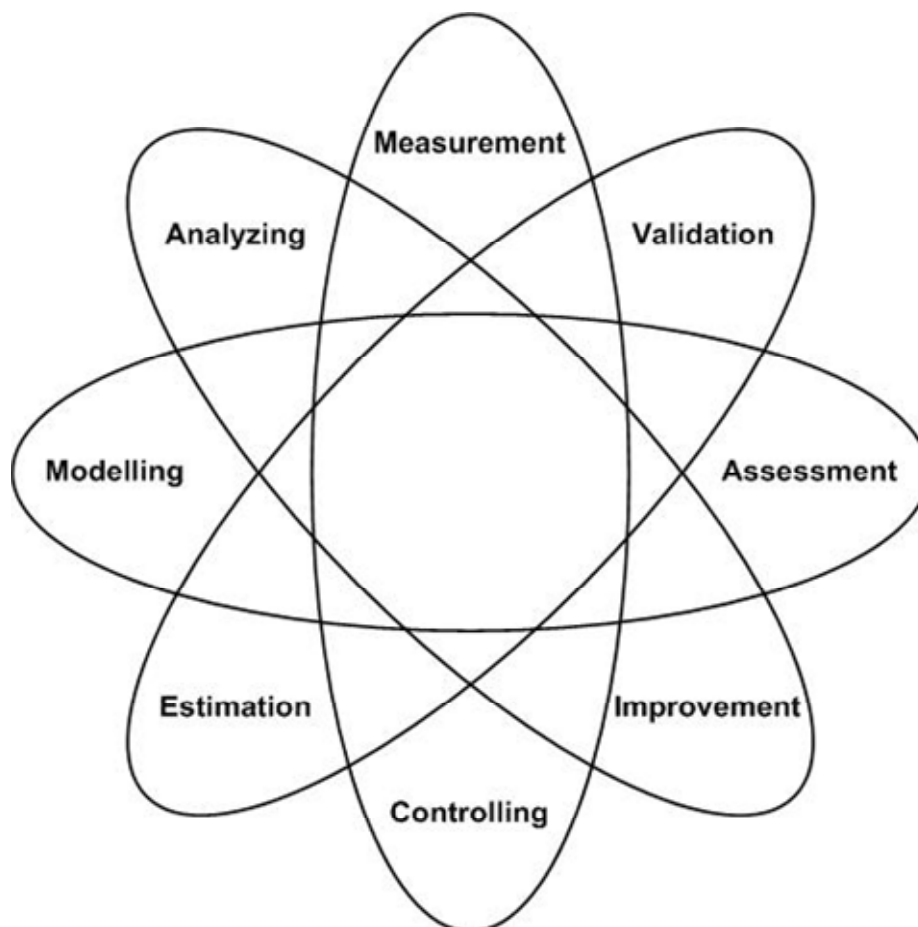


# SOFTWARE MEASUREMENT NEWS

*Journal of the Software Metrics Community*



**Editors:**

*Alain Abran, Manfred Bundschuh, Reiner Dumke, Christof Ebert, Horst Zuse*



The *SOFTWARE MEASUREMENT NEWS* can be ordered directly from the Editorial Office (address can be found below).

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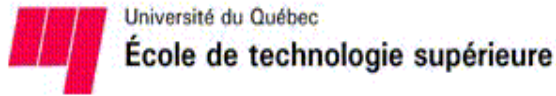
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## IWSM/MENSURA 2009

### PRELIMINARY PROGRAM

**Wednesday November 4, 2009**

8:30	<b>Pre-Registration for workshop attendees</b>	
9:00	<b>Workshop 1: Benchmarking of IT Development Performance</b>	<b>Workshop 2: Measurement of Non-Functional Requirements</b>
	Animators:  Ton Dekkers & Luca Santillo  Group discussion on how to increase benchmarking data collection with ISBSG	<ul style="list-style-type: none"> <li>• Measurement of the functional size of non-functional requirements with International Standards and ECSS40 (Sarayreh)</li> <li>• Group discussion on how to build consensus on measurement of non-functional requirements.</li> </ul>
10:30	<b>Coffee Break</b>	
11:00	<b>Workshop 3: COSMIC : Real-Time Application Guidelines : Planning workshop</b>	Workshop 2 : continuation Discussion on strategy & Planning
12:00	<b>LUNCH: HvA restaurant</b>	
13:00	<b>Workshop 4: COSMIC: Improving Training</b>	<b>Workshop 5: Functional Size Approximation: Why bother with details?</b>
	<ul style="list-style-type: none"> <li>• An Experimental Study on the Reliability of COSMIC Measurement Results (Ungan-Demiror)</li> <li>• Measurement of a Real-time System (Desharnais-Abran-Dikici)</li> <li>• Functional size measurement quality challenges for inexperienced measurers (Trudel)</li> <li>• A Case Study in COSMIC Functional Size Measurement: the Rice Cooker Revisited (Lavazza)</li> <li>• Coffee break</li> </ul>	Animator: Roberto Meli
15:00	<b>Coffee Break</b>	
15:30- 17:00	Workshop 4 : continuation Discussion on strategy & Planning on 'Training and Certification'	<b>COSMIC Certification Exam</b>

**Thursday November 5, 2009**

8:30	<b>Registration</b>		
9:00	<b>Welcome</b>		
9:15	<i>Opening: Prof. Karel van der Toorn, President of Hogeschool van Amsterdam and the University of Amsterdam</i>		
9:30	<b>Keynote 1: To be announced</b>		
10:30	<b>Coffee Break</b>		
11:00	<b>Track: COSMIC I</b>	<b>Track 2.1 Measurement Programs I</b>	
	<ul style="list-style-type: none"> <li>Practical experimentations with the COSMIC method in the automotive embedded software field (Stern) – <i>Industry paper</i></li> <li>Functional Size Measurement Methods Usage by Polish Software Providers (Czarnancka-Crobot)</li> <li>What are the Significant Cost Factors for COSMIC Functional Size Based Effort Estimation? (Bajwa-Gemcel)</li> </ul>	<ul style="list-style-type: none"> <li>Ensuring Reliability of Information Provided by Measurement Systems (Staron-Meding)</li> <li>A General Model for Measurement Improvement (Dumke)</li> <li>Reliability of software metrics tools (Breuker) – <i>Industry paper</i></li> </ul>	
13:00	<b>LUNCH</b>		
14:00	<b>Track: COSMIC II</b>	<b>Track: Measurement Programs II</b>	
	<ul style="list-style-type: none"> <li>A Comparison of Neural Network Model and Regression Model Approaches based on Sub-Functional Components (Tunalilar-Demirors)</li> <li>Extending COSMIC Function Points to Measure Software Data Items (Santillo)</li> <li>Formalization Studies in Functional Size Measurement: How do they Help? (Ozkan-Demirors)</li> </ul>	<ul style="list-style-type: none"> <li>Leveraging people-related maturity issues for achieving higher maturity &amp; capability levels (Buglione)</li> <li>Cockpit based Management Architectures (Neumann)</li> <li>Quality of Process Control in Software Projects (Bougaenko) – <i>Industry paper</i></li> </ul>	
15:30	<b>Coffee Break</b>		
16:00	<b>Track: Measures &amp; Estimation I</b>	<b>Track: Measurement Programs III</b>	
	<ul style="list-style-type: none"> <li>Formal Definition of Measures for BPMN Models (Genero)</li> <li>Empirical Evaluation of Hunk Metrics as Bug Predictors (Ferzung)</li> <li>Assessing the Documentation Deviation Effort in Software Projects (Rodriguez-Soria)</li> </ul>	<ul style="list-style-type: none"> <li>Applying Test Case Metrics in a Tool Supported Iterative Architecture and Code Improvement Process (Vianden)</li> <li>A prototypical simulation model to analyze the Business Process Performance (End-Schmietendorf)</li> <li>A Proposal for an Integrated Measurement and Feedback Environment for Software Projects Based on the Empirical Study of Three Measurement Domains (Mitani) – <i>Industry paper</i></li> </ul>	
17:30	Closing		
18:30-21:00	<b>Dinner - Social Event: Dinner Cruise through the Canals of Amsterdam</b>		

**Friday November 6, 2009**

9:00	<b>Track: Estimation models and techniques</b>	<b>Track: Measurement Programs 4</b>	
	<ul style="list-style-type: none"> <li>• Using Support Vector Regression for Web Development Effort Estimation (Corazza-De Matrino)</li> <li>• Using Tabu Search to Estimate Software Development Effort (Ferruci-Gravino)</li> <li>• Estimating the functional size of applications built with the Oracle eBS Package (Vogelezang) – <i>Industry paper</i></li> <li>• Towards an Early Software Effort Estimation based on Functional and Non-Functional Requirements (Kassab-Ormandjieva)</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement Opportunities and Suggestions for Benchmarking (Buglione-Gemcel)</li> <li>• Using Models to Develop Measurement Systems: A Method and its Industrial Use (Staron-Meding)</li> <li>• Implementing a Metrics Program: MOUSE will help you (Dekkers) – <i>Industry paper</i></li> <li>• Analysis of Risk Assessment Method (Georgieva-Dumke)</li> </ul>	
11:00	<b>Coffee Break</b>		
11:00	Workshop : Theme 1 selected from previous day survey	Workshop: Theme 2 selected from previous day survey	
12:00	<b>LUNCH: HvA Restaurant</b>		
13:00	<b>ISBSG: Analysis of + 300 COSMIC Projects (Charles Symons)</b>		
14:00	<b>Keynote 2: To be Announced</b>		
15:00	<b>Workshops Status Report &amp; Planning &amp; Official Closing</b>		
15:30 to 17:00	<b><i>COSMIC Group International Advisory Committee Meeting – Open to all interested parties</i></b>		

## MetriKon 2009 Programm (Entwurf)

Mittwoch, 18.11.09	<b>Tutorien</b>	
Donnerstag, 19.11.09		
9.15 Uhr	<b>Begrüßung</b>	
9.30 Uhr	<b>1. Hauptvortrag:</b> Dieter Rombach (Uni Kaiserslautern): Software Measurement: Status Review & New Challenges	
10.30 Uhr	Pause	
11 – 12.00 Uhr	<b>Sitzung A1</b>	<b>Sitzung B1</b>
	<b>Messmethodik</b>	<b>Messung der Anforderungen</b>
	Adam Trendowicz (IESE): <i>Measurement-based Software Quality Evaluation</i>	Harry Sneed (Anecon Wien): <i>Anforderungsmetrik</i>
	Reiner Dumke (Uni Magdeburg): <i>Service-orientierte Messdatenbanken</i>	Wolfgang Kuhl (FH Bingen): <i>Einsatz von Metriken zur Verbesserung des Requirements Engineering Prozesses im OpenUP nach CMMI</i>
12.00 Uhr	Mittagspause	
13.00 – 14.00 Uhr	<b>Sitzung A2</b>	<b>Sitzung B2</b>
	<b>Prozessmessung</b>	<b>Six Sigma (1)</b>
	Joachim Jahn: (Jahn Consulting): <i>Entwicklungsprozesse: Produktivität steigern, aber wie?</i>	Peter Louis (Siemens AG): <i>Benefits of Following Six Sigma in SW Engineering</i>
	Dirk Malzahn (ACCEL GmbH): <i>Metriken für den Organisationslebenszyklus</i>	Jürgen Heymann (SAP): <i>Earned Value and Quality Metrics in Agile Development Projects</i>
14.00 Uhr	Pause	
14.30 – 15.30 Uhr	<b>Sitzung A3</b>	<b>Sitzung B3</b>
	<b>Prozessverbesserung</b>	<b>Six Sigma (2)</b>
	Andrea Herrmann (TU Braunschweig): <i>Wie KPIs auf Entscheidungen wirken: ein explorativer Selbstversuch im Zeitmanagement</i>	Thomas Fehlmann (Euro Project AG Zürich): <i>Using Six Sigma for Software Project Estimations An Application of Statistical Methods for Software Metrics</i>
	Nicolas Porta (Daimler AG): <i>Vermessung der Prozesstreue im Qualitätsmanagement</i>	Eberhard Kranich (T-Systems.): <i>Six Sigma as a Toolkit to Improve Software Quality</i>
15.30 Uhr	Pause	
16.00 – 17.30 Uhr	<b>Sitzung A4</b>	
	<b>Prozesseffizienz</b>	
	Christof Ebert (Vector Consulting): <i>Emerging from the Crisis: Improving engineering efficiency in tough times</i>	
	<b>DASMA-Diplompreisvortrag</b>	

<b>Freitag, 20.11.09</b>		
<b>9.00 – 10.30 Uhr</b>	<b>Sitzung A5</b>	<b>Sitzung B5</b>
	<b>Neue Ansätze</b>	<b>Testbewertung</b>
	Andreas Schmietendorf (FHW Berlin): <i>Services aus der Steckdose – Bewertungsaspekte im Umfeld des Cloud Computing</i>	Konstantina Georgieva (Uni Magdeburg): <i>A Risk Taxonomy for the Software Testing Process</i>
	Marcus Ciolkowski (IESE): <i>Measuring the Performance of Open Source Development Communities: The QualOSS Approach</i>	Simona Nica (TU Graz): <i>Challenges in Applying Mutation Analysis on EJB Based Business Applications</i>
	Robert Neumann (Uni Magdeburg): <i>Cockpit based Enterprise Application Development (EAD)</i>	Holger Schackmann (RWTH Aachen): <i>Tool Support for User-Defined Quality Assessment</i>
<b>10.30 Uhr</b>	Pause	
<b>11.00 – 11.45 Uhr</b>	<b>Sitzung A6</b>	
	<b>OO-Metriken</b>	
	Frank Simon (SQS Köln): <i>Benchmarking technischer Qualität zwischen OO- und Nicht-OO-Systemen</i>	
<b>11.45 Uhr</b>	Mittagspause	
<b>13.00 – 14.30 Uhr</b>	<b>Sitzung A7</b>	
	<b>Projektperformance</b>	
	Christian Lescher (Siemens AG): <i>Global Software Engineering: A Metrics-based Framework for Project Steering Support</i>	
	Andreas Schmietendorf (FHW Berlin): <i>Prognoseverfahren zur Bewertung der Prozessperformance und der Prozesskosten</i>	
<b>14.30 Uhr</b>	Pause	
<b>15.00 Uhr</b>	<b>2. Hauptvortrag:</b> Jürgen Knoblach (BMW Group): Systementwicklung im Automotiv-Bereich auf der Grundlage von Messgrößen	
<b>16.00 Uhr</b>	Schlussworte	



GESELLSCHAFT FÜR INFORMATIK E.V.  
Zukunft gestalten.



## **Aufruf des 4. Workshops „Bewertungsaspekte serviceorientierter Architekturen“**

*18. November 2009 Darmstadt (Gastgeber: Software AG)*

### **MOTIVATION**

Für die erfolgreiche Einführung und Nutzung serviceorientierter Architekturen sind qualitative und quantitative Bewertungen im Kontext prozess-, produkt- und ressourcenbezogener Aspekte unerlässlich. Die BSOA-Initiative greift diese Herausforderung auf und führt dazu jährlich einen entsprechenden Workshop durch. Der kommende Workshop wird sich insbesondere mit den folgenden Themen auseinandersetzen.

- Modelle zur Bewertung der SOA-Tauglichkeit einer Organisation,
- Aufwands- und Risikobetrachtungen bei SOA-Entwicklungsprojekten,
- Möglichkeiten zur Bewertung der Serviceentwicklung und Servicekomposition,
- Wirtschaftlichkeitsbetrachtungen bei der SOA-Einführung,
- Bewertungsaspekte beim Management serviceorientierter IT-Infrastrukturen,
- Bewertung der Beeinflussung des Business-IT-Alignments durch eine SOA.

Selbstverständlich geben die dargestellten Themen nur einen ausgewählten Teil möglicher Herausforderungen bei der Bewertung serviceorientierter Architekturen wieder. Dem entsprechend dienen diese der Orientierung und nicht der Einschränkung für potentielle Beiträge.

### **WORKSHOP-BEITRÄGE**

Praktiker und Wissenschaftler, die auf dem Gebiet der Konzeption, Entwicklung und Management serviceorientierter Architekturen tätig sind, werden gebeten, Beiträge im doc- oder pdf-Format einzureichen. Der Umfang der Beiträge sollte 3000 Wörter nicht übersteigen. Die Formatierungsrichtlinien werden auf der unten genannten Webseite veröffentlicht. Angenommene Beiträge werden innerhalb eines 30-minütigen Vortrags präsentiert bzw. in Form eines Posters (innerhalb der Workshoppausen) vorgestellt. Alle angenommenen Beiträge des Workshops erscheinen in einem Tagungsband.



Bitte senden Sie ihre Beiträge per E-Mail an

**`schmiete@ivs.cs.uni-magdeburg.de`**

## **PROGRAMMKOMITEE**

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R. Dumke, Universität Magdeburg  
J. M. Gomez, Uni Oldenburg  
S. Kusterski, Toll Collect  
M. Mevius, FZI Karlsruhe  
H. Pundt, HS Harz  
F. Victor, FH Köln

J. vom Brocke, HS Liechtenstein  
M. Fiedler, Software AG  
W. Greis, TPS Data & CECMG  
G. Limböck, SAP  
R. Molle, ITAB Hamburg  
A. Schmietendorf, HWR Berlin  
C. Wille, FH Bingen

E. Dimitrov, T-Systems  
T. Grawe, Advicio  
M. Irtmann, IBM  
M. Lothar, Robert Bosch GmbH  
S. Nakonz, Bitnologie  
J. Schuck, MATERNA GmbH  
R. Zarnekow, TU Berlin

## **TERMINE**

01.09.2009 Einreichung von Beiträgen  
25.09.2009 Annahme/Ablehnung  
30.09.2009 finales Workshop-Programm  
15.10.2009 Abgabe der druckreifen Beiträge  
18.11.2009 Workshop in Darmstadt

## **WEBSEITE ZUM WORKSHOP**

**`http://ivs.cs.uni-magdeburg.de/~gi-bsoa`**



Fachhochschule für  
Wirtschaft Berlin  
Berlin School of Economics



# Diplomarbeiten-Preis 2009

für studentische Arbeiten aus den Bereichen  
Software-Metriken und Aufwandschätzung

## Ausschreibung

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Deutschsprachige Anwendergruppe für  
Software-Metrik und Aufwandschätzung e.V.

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Manfred Seufert

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Prof. Dr.-Ing. Cornelius Wille

Fachhochschule Bingen

Prof. Dr.-Ing. Horst Zuse

Technische Universität Berlin

+ angefragt

### Termine

**25. September 2009**

Abgabeschluss

**23. Oktober 2009** (spätestens)

Benachrichtigung des Preisträgers

**19. November 2009**

Preisverleihung auf der MetriKon 2009

Software-Metriken sind eine der Schlüsseltechniken für das Management und die Führung von Software-Entwicklungsprozessen. Die praktische Anwendbarkeit von Metriken und die Effektivität von Metrik-Programmen ist dabei immer wieder Gegenstand von engagierten Diskussionen und wissenschaftlichen Betrachtungen. Die DASMA verfolgt das Ziel, diese Diskussionen aufzugreifen und damit den Erfahrungsaustausch über die Anwendung von Metriken zu verbreiten.

Mit der Ausschreibung eines Diplomarbeiten-Preises möchte die DASMA hervorragende Arbeiten auf dem Gebiet "Software-Metriken und Aufwandschätzung" fördern.

Der DASMA Diplomarbeiten-Preis ist mit **1000 €** dotiert und wird 2009 bereits zum siebten Mal verliehen.

### Auswahlkriterien

Kriterien für die Bewertung der eingereichten Arbeiten sind Innovationsgehalt, praktische Umsetzbarkeit, wissenschaftliche Methodik und Klarheit der Darstellung.

### Preiskomitee

Das Preiskomitee wird vom Vorstand der DASMA bestellt und setzt sich aus DASMA-Vorstandsmitgliedern, Hochschullehrern, Industrievertretern und Sponsoren des Preises zusammen. Bei Bedarf können weitere Gutachter beauftragt werden.

### Themenkreis

Generell können Arbeiten zu jedlichen Themen rund um Software-Metriken und Aufwandschätzverfahren eingereicht werden. Zur Orientierung hier eine Auswahl typischer Themen:

- Software-Metriken, Vergleich von Metriken etc.
- Einführung von Metriken, Metriken als "Erfolgsfaktoren"
- Einsatz, Einführung und Erfahrungen mit Aufwandschätzverfahren und -Tools
- Einsatz von Metriken/Aufwandschätzverfahren im Zusammenhang mit Embedded Systems, System Engineering, Integration & Test, Web-Anwendungen, Data Warehouse, OO, etc.
- Quantitatives Projektmanagement, Projektcontrolling, Benchmarking
- Metriken für Prozessverbesserung und Effizienzsteigerung
- Neue Ansätze für den Einsatz von Metriken im IT-Bereich

### Teilnahmebedingungen

Zugelassen sind abgeschlossene Diplom-, Master-, Magister- oder Bachelor-Arbeiten an einer deutschsprachigen Hoch- oder Fachhochschule, die sich mit dem o.g. Themenkreis befassen und im Zeitraum **August 2008 – Juli 2009** fertiggestellt worden sind. Die Einreichung muss vom **Betreuer der Arbeit** erfolgen.

Eingereicht werden müssen:

- die vollständige Arbeit in deutscher oder englischer Sprache,
- eine max. 5-seitige Kurzfassung in deutscher Sprache,
- Nachweis der Fertigstellung und erfolgten Benotung der Arbeit,
- Begründung warum diese Arbeit exzellent ist und als preiswürdig empfohlen wird,
- Begleitschreiben mit folgenden Informationen: Name, Vorname, Anschrift, Telefonnummer, E-Mail-Adresse, Titel der Arbeit, Betreuer und Hochschule

Alle Unterlagen müssen in elektronischer Form (PDF) an [wille@fh-bingen.de](mailto:wille@fh-bingen.de) und [mleszak@alcatel-lucent.com](mailto:mleszak@alcatel-lucent.com) eingereicht werden und verbleiben bei der DASMA.

Mit der Abgabe der Diplomarbeit stimmt der/die Verfasser/in einer Veröffentlichung der Arbeit (auch auszugsweise) auf der DASMA-Homepage zu. Eine weitere Publikation über andere Medien findet seitens der DASMA nicht statt.

Der/die Preisträger/in verpflichtet sich, auf der **MetriKon 2009** in Kaiserslautern am **19. November 2009** den Preis persönlich entgegenzunehmen und die Arbeit in einem ca. 30-minütigen Vortrag zu präsentieren. Der Vortrag und die Kurzfassung werden in den MetriKon-Tagungsband aufgenommen. Reisekosten (Bahn 2. Klasse) und Unterkunftskosten (eine Übernachtung) trägt die DASMA. Die DASMA behält sich vor, bei Nichterscheinen den Preis einzubehalten.

Die Entscheidung über die Preiszuerkennung wird unter Ausschluss des Rechtsweges getroffen. Eine Aufteilung des Preises auf mehrere Preisträger ist gegebenenfalls möglich. Das Preiskomitee kann von einer Preiszuerkennung absehen, falls keine geeigneten Arbeiten eingereicht werden.

### Weitere Informationen

Alle Informationen zur **DASMA e.V.**, zur **MetriKon 2009** und zum **DASMA Diplomarbeiten-Preis** finden Sie unter [www.dasma.org](http://www.dasma.org). Im Mitgliederbereich sind **alle eingereichten Diplomarbeiten** der vorjährigen MetriKon Events zugänglich.



## Call for Papers

### International Journal of Software Engineering and Knowledge Engineering

#### *Featured Topic Issue on Current Trends in Software Measurement*

**Editor-in-Chief:** S. K. Chang

**Guest Editors** (Alphabetical order): Alain Abran, University of Quebec, Canada, Juan J. Cuadrado-Gallego, University of Alcala, Spain, and Reiner Dumke, Otto-von-Guericke University of Magdeburg, Germany

#### **Motivation**

To provide software project managers with the necessary information to help them get more control over the development projects and take better decisions in an increasingly competitive market, the importance of Software Measurement aspects has considerably increased in the software engineering community. A number of research initiatives are actively being pursued in software measurement, including on software functional and non-functional size measurement, effort estimation models, software test measurement models or software quality measurement models. In addition a number of new research initiatives are investigating the application of software measurement to new software development paradigms and architectures, like agile development or service oriented architectures. The aim of this featured topic issue is to present recent research initiatives and results on current trends in software engineering measurement.

This featured topic issue aims to support and leverage research diffusion initiatives in the field of software measurement such as the international conference Mensura-IWSM and a number of special sessions on software measurement at main international conferences (SEKE 2009, SERP 2009, EuroSPI 2009 or Euromicro 2009). The recent release of the ISBSG (International Software Benchmarking Standards Group) repository with data over 5,000 software projects also go in the same direction. The importance of measurement is also reflected in the proposal of a new chapter in the IEEE Guide to the

Software Engineering Body of Knowledge (SWEBOK) specifically dedicated to measurement.

### Scope

The main objective of the featured topic issue is reporting recent high-quality research on the field of software measurement. Topics of interest include (but are not limited to):

- *Functional size measurement.*
- *Formal aspects of software measurement.*
- *Software measurement in new environments.*
- *Software measurement in new architectures.*
- *Measurement and prediction.*
- *Measurement of effort and cost.*
- *Industrial experiences in software measurement.*
- *Measurement-based decision making.*
- *Planning and implementing a measurement program.*
- *Best practices in software measurement.*
- *Measurement on Non Functional Requirements*
- *Automation of Software Measurement.*

Papers submitted should present new high quality research in the field.

### Important dates

Submission of extended abstracts (\*) (2–3 pages) December 1, 2009, Notification about appropriateness for the featured topic issue December 15, 2009

<b>Submission deadline February</b>	<b>15, 2010</b>
All reviews back	May 15, 2010
Notification (1st round)	June 1, 2010
Revised submission deadline	August 1, 2010
All reviews back	October 15, 2010
Final notification	November 1, 2010
Final Papers Due	December 1, 2010
Publication	March 1, 2011

(\*) Note: The submission of extended abstracts is intended only to provide feedback to authors about the appropriateness of their paper to the topics of the featured topic issue, and it is not mandatory. Editors of this featured topic issue: Alain Abran, Juan J. Cuadrado-Gallego and Reiner Dumke

### Submissions

Only original papers written in English, which have not been submitted elsewhere, will be considered for publication. All papers submitted will be subject to a thorough peer review process. Authors should aim at papers of 12 to –24 pages in the final format.

Send your manuscripts in PDF or EPS format directly to the any featured topic issue editor [alain.abran@etsmtl.ca](mailto:alain.abran@etsmtl.ca); [jjcg@uah.es](mailto:jjcg@uah.es); [dumke@ivs.cs.uni-magdeburg.de](mailto:dumke@ivs.cs.uni-magdeburg.de)

PROCEEDINGS OF  
THE 2009 INTERNATIONAL CONFERENCE ON  
SOFTWARE ENGINEERING RESEARCH & PRACTICE

# SERP 2009

**Volume I**

**Editors**

**Hamid R. Arabnia  
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**Associate Editors**

**Alain Abran, Juan J. Cuadrado-Gallego  
Reiner Dumke, Emanuel Grant  
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**WORLDCOMP'09**

July 13-16, 2009

Las Vegas Nevada, USA

[www.world-academy-of-science.org](http://www.world-academy-of-science.org)

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## Workshop

### **„Software Projects and Products Measurement“**

*WORLDCOMP 2009, July, 15, 2009, Las Vegas (USA)*

**Kadir Alpaslan Demir (Turkish Naval Academy, Tuzla, Istanbul, Turkey)**

A Survey on Challenges of Software Project Management

**Pablo Rodriguez-Soria, Borja Martin-Herrera, Maria J. Dominguez-Alda, Marian Fernandez de Sevilla, Jose Alberto Lucendo-Patino (Universidad de Alcala, Madrid, Spain)**

Determining the Standard Deviation for COSMIC Software Functional Size Measurement

**Alain Abran, Jean-Marc Desharnais, Juan Jose Cuadrado-Gallego (Universidad de Alcala, Madrid, Spain)**

Metrology and Quantitative Analysis in ISO 15939

**Ishrar Hussain, Olga Ormandjieva, Leila Kosseim (University of Concordia, Canada)**

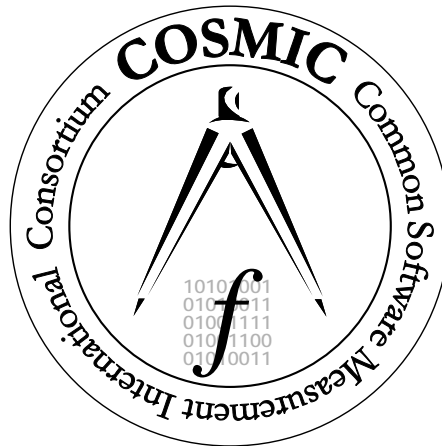
Automatic Measurement of Software Product Functional Size with COSMIC

**Kadir Alpaslan Demir, James Bret Michael, John S. Osmundson (Naval Postgraduate School, Monterey, California, USA)**

Approaches for Measuring Software Project Management Effectiveness

**Cuauhtemoc Lopez-Martin, Ivica Kalichanin-Balich, Arturo Chavoya-Pena, Maria Elena Meda-Campana (Guadalajara University, Jalisco, Mexico)**

Relating Types of Lines of Code for Predicting the Software Development Effort of Small Programs Using a Fuzzy Model: Economizing Variables



### **Information from the COSMIC**

*Based on the initiative by Harold van Heeringen and Luca Santillo to get more COSMIC-measured project data submitted to the ISBSG repository, now we have data on well over 300 projects to develop or enhance business application, real-time and infrastructure software, and have been able to establish seriously-valuable benchmarks for the first time for all these categories of software, and to analyse the data by various parameters, such as size and programming language level.*

*Reiner Dumke*

## **CuBIT**

### ***Software Measurement Laboratory***

***Madrid, Spain ([www.cc.uah.es/cubit](http://www.cc.uah.es/cubit))***

The Software Measurement Laboratory, CuBIT, was founded at the Computer Science Department of the Escuela Técnica Superior de Ingeniería Informática, Universidad de Alcalá, Madrid, Spain by Prof. Dr. Juan J. Cuadrado-Gallego. The name CuBIT proceed to the Egyptian and Mesopotamian Cubit unit, which were used in the 3rd millennium B.C. and are the earliest known units used by ancient peoples to measure length.

Nowadays CuBIT has open two main Research lines, first is about Software Functional Size Measurement, especially centered in the study of IFPUG and COSMIC units. The second is about Software Pojects Management especially centered in the study of Software Projects Planning and Scheduling and Software Projects Tracking. Nevertheless CuBIT research interests include other aspects of software measurement like Software Measurement Education.

In all its research lines the CuBIT has done very important efforts to transfer its research results into the Industry, and in the last years has develop strong relationships with some of the principal Software Development and Telecommunications Companies in Spain, with which the CuBIT has signed different Consultancy and Research agreements. Also, the CuBIT has research collaboration agreements with the Software Measurement Laboratory, SML@b, of the Institut für Verteilte Systeme, Fakultät für Informatik, Otto-von-Guericke-Universität, Magdeburg, Germany; and the Software Engineering Research Laboratory, GÉLOG, of the École de Technologie Supérieure, Université du Québec, Montreal, Canada.

Dr. Juan J. Cuadrado-Gallego is Profesor Titular de Universidad and the Director of the Ph.D. degree in Computer Science at the Computer Science Department of the Universidad de Alcalá, Madrid, Spain; he is also Associate professor at the École de Technologie Supérieure, Université du Québec, Montreal, Canada. Has been Teaching Staff in the Otto-von-Guericke Universität, Magdeburg, Germany, in 2009 and 2008, and in the Università degli Studi Roma Tre, Roma, Italy, in 2004. Previously he has been professor at the Spanish Universities Carlos III de Madrid, University of Valladolid and Open University of Catalonia.

Dr. Cuadrado-Gallego is Permanent Member of the Advisory Board of the International Conference on Software Process and Product Measurement, Mensura; and he belongs to the program committee of most the main international conferences on software measurement. Since 2006 he was the President of the Spanish Function



Points Users Group SFPUG, official chapter in Spain of the International Function Points Users Group IFPUG, recently merged with the Spanish Software Measurement Association, AEMES, where he is the director of software measurement and international relationships board. Since 2007 he is Member of the International Advisory Committee and the Measurements committee of the Common Software Measurement Consortium COSMIC.

Dr. Cuadrado-Gallego has published more than 20 scientific papers in main international journals and more than 100 papers in the main international conferences. He has edited software measurement special issues in some of the more reputed international journals, like the Journal of Systems and Software, International Journal of Software Engineering and Knowledge Engineering or Software Process Improvement: Research and Practice. He has also edited conference proceedings in Springer and other main editorials.



**Dumke, R.; Mencke, S.; Wille, C.:**

***Quality Assurance of Agent-Based and  
Managed Systems***

**Self-**

*CRC Press Taylor & Francis Group, 2010 (154 Seiten)  
ISBN 978-1-4398-1266-2*

The challenges in implementing intelligent and autonomous software systems remain to be the development of self-adapting systems, self-healing applications. Corporate global creation, and collaborated robotic teams. With software agent technology widely recognized as a key approach in implementing such global infrastructure, the importance of the role of quality assurance of agent-based systems and system development is growing daily.

Based on the author's more than 15 years of experience in software agent technology, **Quality Assurance of Agent-Based and Self-Managed Systems** presents the basic principles and structures of agent technology. It covers the main quality issues of software system development and provides examples of agent measurement and evaluation. The authors focus on software agent systems and multiagent systems (MAS) and discuss the determination of quality properties. They also explain different techniques and approaches used to evaluate the development of MAS. The final chapter summarizes quality assurance approaches for agent-based systems and discusses some open problems and future directions.

Although often complex and difficult to manage, the applications for software agent systems in essential life systems in crease every day. Since the quality of the agent-based self-managing systems is a central point of software risk; analyzing, evaluating, and improving the quality measurement situation will always be a concern when developing these systems. With more than 60 illustrations and 20 tables, this book builds a foundation in quality and quality for agent-based technology.

**Dumke, R.; Braungarten, R.; Büren, G.; Cuadrado-Gallego, J. J.:**

***Software Process and Product Measurement***

***International Conferences IWSM 2008, MetriKon 2008, and Mensura 2008***

*Springer-Verlag, 2008 (361 Seiten)  
LNCS 5338, ISBN-13 978-3-540-89402-5*

Since 1990 the International Workshop on Software Measurement (IWSM) has been celebrated annually alternating between Montréal (Canada) and various cities across Germany. The Montréal editions have been organized by the Software Engineering Research Laboratory (GELOG) of the École de technologie supérieure – Université Québec, which is directed by Prof. Alain Abran. The German editions have been organized jointly by the Software Measurement Laboratory (SMLAB) of the Otto von Guericke University Magdeburg (Germany), which is directed by Prof. Reiner R. Dumke; and the German association for software metrics and effort estimation

(DASMA e.V.), which is led by Manfred Bundschuh and Günter Büren. The biennial editions of IWSM in Germany has been held jointly with the DASMA Software Metrics Congress (MetriKon) since 2002. MetriKon is a yearly event, conducted every other year for a German-speaking audience at changing national locations for best-practice sharing of software measurement topics, bringing the best and renowned German-speaking experts of the field together.

This volume comprises the proceedings of IWSM / MetriKon / Mensura 2008 and consists of the final papers presented at these joint events. Each one of these papers has been thoroughly revised and extended in order to be accepted for publication.

**Schmietendorf, A.; Klöppel, B.; Dumke, R.R.:**

**3. Workshop Bewertungsaspekte serviceorientierter Architekturen  
(BSOA 2008)**

*Shaker Verlag, Aachen, 2008 (162 Seiten)  
ISBN 978-3-8322-7221-0*

Modern Integrationsarchitekturen bestimmen nach wie vor die Art und Weise, wie softwaretechnische Lösungen im Kontext industrieller Problemstellungen umzusetzen sind. Immer stärker wird den Verantwortlichen dabei bewusst, dass der Erfolg unternehmensweit genutzter Integrationsarchitekturen weniger von einzukaufenden Produkten abhängt, als vielmehr von prozess- und organisationsbezogenen Aspekten beeinflusst wird. Die Implementierung einer serviceorientierten Architektur ist als Strategie zu verstehen, wobei die Vision einer geschäftsprozesskonformen Ausrichtung der IT-Landschaft verfolgt wird. In diesem Kontext werden vielfältige Bewertungsansätze benötigt, die den gesamten Lebenszyklus eines Informationssystems erfassen können. Die BSOA-Initiative widmet sich seit mehr als 2 Jahren diesen Fragen.

Aus der Vielzahl an eingereichten Beiträgen konnte durch das Programmkomitee eine anspruchsvolle Agenda zusammengestellt werden. Ausgewählt wurden 6 Beiträge für eine Präsentation während der Workshopsitzungen und 5 Beiträge für Posterpräsentationen während der Pausenzeiten. Dazu kommen noch die beiden Keynote-Vorträge, die das vorliegende Buch in exzellenter Weise ergänzen und prägen.

**Bundschuh, M.; Dekkers, C.:**

***The IT Measurement Compendium***

*Springer-Verlag, 2008 (643 Seiten)*  
*ISBN 978-3-540-68187-8*

The first step towards success in a software project is to ensure a professional setup. This includes a metrics-based formal estimation process to ensure a solid foundation for project planning. Accurate estimates require quantitative measurements, ideally tool based. In addition, software project managers must also monitor and update these estimates during the project's lifecycle to control progress and assess possible risks.

Based on their many years of practical experience as software managers and consultants, Manfred Bundschuh and Carol Dekkers present a framework of value to anyone involved with software project management. They present all five ISO/IEC-acknowledged Functional Sizing Methods, with variants, experiences, counting rules and case studies, and they use numerous practical examples to show how to use functional size measurement to produce realistic estimates.

Written in a highly practical style, including checklists, templates, and hands-on advice, and backed up with many pointers to both national and international metrics and standards organizations, this book is the ideal companion for the busy software project manager or quality assurance manager.

**Cuadrado-Gallego, J. J.; Braungarten, R.; Dumke, R. R.; Abran, A.:**

***Software Process and Product Measurement***

***International Conference, IWSM-Mensura 2007***

*Springer-Verlag, 2008 (202 Seiten)*  
*LNCS 4895, ISBN-13 978-3-540-85552-1*

This volume is the post-proceedings of the IWSM-Mensura 2007 conference and consists of a set of 16 final papers selected from the conference. Each one of these papers has been thoroughly revised and extended in order to be accepted for this edition. The IWSM-Mensura Steering Committee is very proud to have obtained the approval of Springer to publish the first edition of the joint conference post-proceedings in the prestigious Lecture Notes in Computer Sciences (LNCS) series and hope to maintain this collaboration for the future editions of the conference.

**Büren, G.; Bundschuh, M.; Dumke, R.:**

***MetriKon 2007 – Praxis der Software-Messung***

*Shaker Verlag, Aachen, November 2007 (350 Seiten)*  
*ISBN 978-3-8322-6703-2*

The book includes the proceedings of the DASMA Metric Conference **MetriKon 2007** held in Kaiserslautern in November, 2007, which constitute a collection of theoretical studies in the field of software measurement and case reports on the application of software metrics in companies and universities.

The contents are described by the listing of the paper abstracts in this Metrics News.

**Schmietendorf, A.; Mevius, M.; Dumke, R.R.:**

***2. Workshop Bewertungsaspekte serviceorientierter Architekturen (BSOA 2007)***

*Shaker Verlag, Aachen, November 2007 (132 Seiten)*  
*ISBN 978-3-8322-6716-2*

The book includes the proceedings of the 2. Workshop Bewertungsaspekte serviceorientierter Architekturen **BSOA 2007** held in Karlsruhe in November, 2007, which constitute a collection of theoretical studies in the field of software measurement and case reports on the application of software metrics in companies and universities.

The contents are described by the listing of the paper abstracts in this Metrics News.

**Ebert, C.; Dumke, R.:**

***Software Measurement***

***Establish - Extract - Evaluate - Execute***

*Springer-Verlag Berlin Heidelberg, 2007 (561 Seiten)*  
*ISBN 978-3-540-71648-8*

Our world is shaped by software. Since software is so ubiquitous, we need to stay in control. Software measurement is the discipline that assures that we stay in control. In this volume, Ebert and Dumke provide a comprehensive introduction to software measurement. They detail knowledge and experiences about software measurement in an easily understood, hands-on presentation.

Brief references are embedded from world-renown experts such as Alain Abran, David Card, Robert Glass, Peter Liggesmeyer, Charles Symons, and many more. Examples and case studies are provided from Global 100 companies such as Alcatel-Lucent, Atos Origin, Axa, Bosch, Deloitte, Deutsche Telekom, Shell and Siemens.

This combination of methodologies and applications makes the book ideally suited for both professionals in the software industry and for scientists looking for benchmarks and experiences. Besides the many practical hints and checklists readers will also appreciate the comprehensive reference list. Further information, continuously updated, can be found on the book's Web site: <http://metrics.cs.uni-magdeburg.de/>.

**Jones, C.:**

***Estimating Software Costs: Bringing Realism to Estimating,  
Second Edition***

*Mc Graw Hill Publ., 2007 (644 Seiten)*  
*ISBN: 978-0-07-148300-1*

Get a clear, complete understanding of how to estimate software costs, schedules, and quality using the real-world information contained in this comprehensive volume. Find out how to choose the correct hardware and software tools, develop an appraisal strategy, deploy tests and prototypes, and produce accurate software cost estimates. Plus, you'll get full coverage of cutting-edge estimating approaches using Java, object-oriented methods, and reusable components.

- Plan for and execute project-, phase-, and activity-level cost estimations
- Estimate regression, component, integration, and stress tests
- Compensate for inaccuracies in data collection, calculation, and analysis
- Assess software deliverables and data complexity
- Test design principles and operational characteristics using software prototyping
- Handle configuration change, research, quality control, and documentation costs

**Selby, R.W.:**

***Software Engineering***

***Barry W. Boehm's Lifetime Contributions to Software Development,  
Management, and Research***

*IEEE Computer Society Publ., 2007 (818 Seiten)*  
*ISBN: 978-0-470-14873-0*

This book presents forty-two of Barry W. Boehm's best articles on software engineering, organizes them into nine chapters with newly written summaries by nine of his colleagues, and concludes with a new chapter on Barry's "thoughts for the future." The book chapters address:

- Software Architecture and Quality
- Software Economics
- Software Tools
- Software Process: Early Spiral Model
- Software Risk Management
- Software Process: Emerging Extensions
- Software and Systems Management
- Software Engineering State of the Art and Practice
- Value-Based Software Engineering
- A Software Engineer in the Software Century

This book is recommended as a guide and resource for software engineers, project managers, and technology executives as well as a textbook for advanced undergraduate and graduate courses.

**Basili, V.R.; Rombach, D.; Schneider, K.; Kitchenham, B.; Pfahl, D.; Selby, R.W.:**

***Empirical Software Engineering Issues  
Critical Assessment and Future Directions***

*Springer-Verlag Berlin Heidelberg, 2007 (192 Seiten)*  
*ISBN-10: 3-540-71300X, ISBN-13: 978-3-540-71300-5*

This book constitutes the thoroughly refereed post-proceedings of the International Dagstuhl-Seminar on Empirical Software Engineering, held in Dagstuhl Castle, Germany in June 2006. The purpose of this workshop was to identify the progress of empirical software engineering since 1992, to summarize that state-of-the-art in ESE, to summarize the state-of-the-practice in ESE in industry, and to develop an ESE roadmap for research, practice, education and training.

**Rud, D.:**

***Qualität von Web Services - Messung und Sicherung der  
Performance***

*VDM Verlag Dr. Müller Saarbrücken, 2006 (201 Seiten)*  
*ISBN-10: 3-86550-666-6, ISBN-13: 978-3-86550-666-5*

Web Services stellen eine neue Technologie verteilter Anwendungen dar, welche – dank der Benutzung standardisierter Formate und Protokolle – viele Interoperabilitäts- und Kompatibilitätsprobleme lösen soll, die bei der Verwendung früherer Technologien vorkamen.

Die Dienstgüte (quality of service, QoS) von Web Services hat viele Aspekte, wie z.B. Performance, Skalierbarkeit, Sicherheit usw. In dieser Arbeit steht die Performance im Mittelpunkt.



Im ersten Teil des Buches werden grundlegende Web Service-Technologien sowie ihre Bedeutung im Kontext der Dienstgüte untersucht. Danach folgt eine Analyse von existierenden mathematischen Modellen, komplexen Managementinfrastrukturen und praktischen Fallstudien auf dem Gebiet der Qualitätssicherung von Web Services.

Der zweite Teil beschreibt einen Web Service-Messservice. Es werden theoretische und technische Aspekte der Messung der Performance von Web Services sowie der Aufbau der wichtigsten Komponente des Messservice – des Lasttreibers – diskutiert. Schließlich werden interne Abläufe und die webbasierte Benutzerschnittstelle des Messservice beschrieben.

Das Buch richtet sich an Praktiker, die sich mit Web Service befassen.

### **McConnell, S.:**

#### ***Software Estimation: Demystifying the Black Art***

*Microsoft Publ., 2006 (308 Seiten)*

*ISBN: 978-0-7356-0535-0*

Often referred to as the “black art” because of its complexity and uncertainty, software estimation is not as difficult or puzzling as people think. In fact, generating accurate estimates is straightforward – once you understand the art of creating them.

In his highly anticipated book, acclaimed author Steve McConnell unravels the mystery to successful software estimation – distilling academic information and real-world experience into a practical guide for working software professionals. Instead of arcane treatises and rigid modelling techniques, this guide highlights a proven set of procedures, understandable formulas, and heuristics that individuals and development teams can apply to their projects to help achieve estimation proficiency.

Discover how to:

- Estimate schedule and cost – or estimate the functionality that can be delivered within a given time frame
- Avoid common software estimation mistakes
- Learn estimation techniques for you, your team, and your organization
- Estimate specific project activities – including development, management, and defect correction
- Apply estimation approaches to any type of project – small or large, agile or traditional
- Navigate the shark-infested political waters that surround project estimates

### **Kandt, R.K.:**

## **Software Engineering Quality Practices**

*Auerbach Publications, 2006 (256 Seiten)*  
*ISBN 3-8493-4633-9*

Software Engineering Quality Practices describes how software engineers and the managers who supervise them can develop quality software in an effective, efficient, and professional manner. This volume conveys practical advice quickly and clearly while avoiding the dogma that surrounds the software profession. It concentrates on what the real requirements of a system are, what constitutes an appropriate solution, and how you can ensure that the realized solution fulfils the desired qualities of relevant stakeholders. The book also discusses how successful organizations attract and keep people who are capable of building high-quality systems.

The author succinctly describes the nature and fundamental principles of design and incorporates them into an architectural framework, enabling you to apply the framework to the development of quality software for most applications. The text also analyzes engineering requirements, identifies poor requirements, and demonstrates how bad requirements can be transformed via several important quality practices.

**Lanza, M.; Marinescu, R.:**

### ***Object-Oriented Metrics in Practice***

*Springer-Verlag Berlin Heidelberg, 2006 (205 Seiten)*  
*ISBN-10 3-540-24429-8*  
*ISBN-13 978-3-540-24429-5*

Metrics are paramount in every engineering discipline. However, due to its lack of rigor and its intrinsic complexity, software engineering is not considered a classical engineering activity. Moreover, defining, understanding and applying software metrics often looks like an overly complex activity, recommended only to 'trained professionals'. In general, if a software system is delivering the expected functionality, only few people – if any – care about measuring the quality of its internal structure. Consequently, software metrics are still regarded rather circumspectly by most software developers.

Lanza and Marinescu demystify the design metrics used to assess the size, quality and complexity of object-oriented software systems. Based on a novel approach, backed by generally accepted semantics for metrics and by statistical information from many industrial projects, they deduce a suite of metrics-based patterns for assessing the design of object-oriented software systems. They show in detail how to identify design disharmonies in code, and how to devise and apply remedies.

The combination of theoretically sound results and practically tested procedures and solution paths makes this book an ideal companion for professional software architects, developers and quality engineers. The pattern-oriented description of disharmonies offers easy access to detecting shortcomings and applying solutions to real problems.

**Laird, L.M.; Brennan, M.C.:**

## **Software Measurement and Estimation: A Practical Approach**

*IEEE Computer Society, Wiley Interscience, 2006 (257 Seiten)*  
*ISBN 3-471-67622-5*

The text begins with the foundations of measurement, identifies the appropriate metrics, and then focuses on techniques and tools for estimating the effort needed to reach a given level of quality and performance for a software project. All the factors that impact estimations are thoroughly examined, giving you the tools needed to regularly adjust and improve your estimations to complete a project on time, within budget, and at an expected level of quality.

This text includes several features that have proven to be successful in making the material accessible and easy to master:

- Simple, straightforward style and logical presentation and organization enables you to build a solid foundation of theory and techniques to tackle complex estimations
- Examples, provided throughout the text, illustrate how to use theory to solve real-world problems
- Projects, included in each chapter, enable you to apply your newfound knowledge and skills
- Techniques for effective communication of quantitative data help you convey your findings and recommendations to peers and management

Software Measurement and Estimations: A Practical Approach allows practicing software engineers and managers to better estimate, manage, and effectively communicate the plans and progress of their software projects. With its classroom-tested features, this is an excellent textbook for advanced undergraduate-level and graduate students in computer science and software engineering.

### **Preprints/Technical Reports:**

**Farooq, A.; Dumke, R. R.:** *Evaluation Approaches in Software Testing*. University of Magdeburg 2008

**Richter, K.; Dumke R. R.:** *The Causal-Based Software Process Modelling*. University of Magdeburg 2008

**Dumke, R.; Kunz, M.; Farooq, A.; Georgieva, K.; Hegewald, H.:** *Formal Modelling of Software Measurement Levels of Paradigm-Based Approches*. University of Magdeburg 2008

see as pdf files:

<http://ivs.cs.uni-magdeburg.de/sw-eng/agruppe/forschung/Preprints.shtml>

**QSIC 2009:**

**8th International Conference on Software Quality**

August 24-25, 2009, Jeju, Korea

see: <http://home.ewha.ac.kr/~bjchoi/conference/QSIC2009/>

**QEST 2009:**

**5rd International Conference on Quantitative Evaluation of SysTems**

September 13-16, 2009, Budapest, Hungary

see: <http://www.qest.org/qest2009/>

**ASQT 2009:**

**Arbeitskonferenz Softwarequalität und Test 2009**

September 16-18, 2009, Klagenfurt, Austria

see: <http://www.asqt.org/>

**CONQUEST 2009:**

**11. International Conference on Software Quality**

September 16-18, 2009, Nuremberg, Germany

see: <http://www.conquest-conference.org/>

**UKSMA 2009:**

**20th Annual UKSMA Conference - Managing your Software (through Measurement)**

October 14 , 2009, London, UK

see: <http://www.uksma.co.uk/>

**ESEM 2009:**

**International Symposium on Empirical Software Engineering & Measurement**

October 15-16, 2009, Lake Buena Vista, FL, USA

see: <http://www.esem-conferences.org/>

**IWSM/Mensura 2009:**

**Common international Conference on Software Measurement**

November 4-6, 2009, Amsterdam, Netherlands

see: [http://ivs.cs.uni-magdeburg.de/~dumke/CFP\\_2009.html](http://ivs.cs.uni-magdeburg.de/~dumke/CFP_2009.html)

**BSOA 2009:**

**3. Workshop Bewertungsaspekte service-orientierte Architekturen**

November 18, 2009, Software AG, Darmstadt

see: <http://ivs.cs.uni-magdeburg.de/~gi-bsoa/2009/>

**MetriKon 2009:**

**Common international Conference on Software Measurement**

November 19-20, 2009, Kaiserslautern, Germany

see: <http://www.dasma.org>

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**SWQD 2010:**

**Software Quality Days**

January 19-21, 2010, Wien, Austria

see: <http://www.software-quality-days.at/>

**WOSP 2010:**

**7th International Workshop on Software & Performance**

..., 2010, ...

see: <http://www.inf.pucrs.br/wosp/>

**see also: OOIS, ECOOP and ESEC European Conferences**

### **Other Information Sources and Related Topics**

- **<http://rbse.jsc.nasa.gov/virt-lib/soft-eng.html>**  
Software Engineering Virtual Library in Houston
- **<http://www.mccabe.com/>**  
McCabe & Associates. Commercial site offering products and services for software developers (i. e. Y2K, Testing or Quality Assurance)
- **<http://www.sei.cmu.edu/>**  
Software Engineering Institute of the U. S. Department of Defence at Carnegie Mellon University. Main objective of the Institute is to identify and promote successful software development practices.  
Exhaustive list of publications available for download.
- **<http://dxsting.cern.ch/sting/sting.html>**  
Software Technology Interest Group at CERN: their WEB-service is currently limited (due to "various reconfigurations") to a list of links to other information sources.
- **<http://www.spr.com/index.htm>**  
Software Productivity Research, Capers Jones. A commercial site offering products and services mainly for software estimation and planning.
- **<http://www.qucis.queensu.ca/Software-Engineering/>**  
This site hosts the World-Wide Web archives for the USENET usegroup comp.software-eng. Some links to other information sources are also provided.
- **<http://www.esi.es/>**  
The European Software Institute, Spain
- **<http://www.lrgl.uqam.ca/>**  
Software Engineering Management Research Laboratory at the University of Quebec, Montreal. Site offers research reports for download. One key focus area is the analysis and extension of the Function Point method.
- **<http://www.SoftwareMetrics.com/>**  
Homepage of Longstreet Consulting. Offers products and services and some general information on Function Point Analysis.
- **<http://www.utexas.edu/coe/sqi/>**  
Software Quality Institute of the University of Texas at Austin. Offers comprehensive general information sources on software quality issues.

- <http://www.trese.cs.utwente.nl/~vdberg/thesis.htm>  
Klaas van den Berg: Software Measurement and Functional Programming (PhD thesis)
- <http://divcom.otago.ac.nz:800/com/infosci/smrl/home.htm>  
The Software Metrics Research Laboratory at the University of Otago (New Zealand).
- <http://ivs.cs.uni-magdeburg.de/sw-eng/us/>  
Homepage of the Software Measurement Laboratory at the University of Magdeburg.
- <http://www.cs.tu-berlin.de/~zuse/>  
Homepage of Dr. Horst Zuse
- <http://dec.bournemouth.ac.uk/ESERG/bibliography.html>  
Annotated bibliography on Object-Oriented Metrics
- <http://www.iso.ch/9000e/forum.html>  
The ISO 9000 Forum aims to facilitate communication between newcomers to Quality Management and those who have already made the journey have experience to draw on and advice to share.
- <http://www.qa-inc.com/>  
Quality America, Inc's Home Page offers tools and services for quality improvement. Some articles for download are available.
- <http://www.quality.org/qc/>  
Exhaustive set of online quality resources, not limited to software quality issues
- <http://freedom.larc.nasa.gov/spqr/spqr.html>  
Software Productivity, Quality, and Reliability N-Team
- <http://www.qsm.com/>  
Homepage of the Quantitative Software Management (QSM) in the Netherlands
- <http://www.iese.fhg.de/>  
Homepage of the Fraunhofer Institute for Experimental Software Engineering (IESE) in Kaiserslautern, Germany
- <http://www.highq.be/quality/besma.htm>  
Homepage of the Belgian Software Metrics Association (BeSMA) in Keebergen, Belgium
- [http://www.cetus-links.org/oo\\_metrics.html](http://www.cetus-links.org/oo_metrics.html)  
Homepage of Manfred Schneider on Objects and Components

- <http://dec.bournemouth.ac.uk/ESERG/bibliography.html>  
An annotated bibliography of object-oriented metrics of the Empirical Software Engineering Research Group (ESERG) of the Bournemouth University, UK

### **News Groups**

- [news:comp.software-eng](mailto:news:comp.software-eng)
- [news:comp.software.testing](mailto:news:comp.software.testing)
- [news:comp.software.measurement](mailto:news:comp.software.measurement)

### **Software Measurement Associations**

- <http://www.dasma.org>  
DASMA Deutsche Anwendergruppe für SW Metrik und Aufwands-schätzung e.V.
- <http://www.aemes.fi.upm.es>  
AEMES Association Espanola de Metricas del Software
- <http://www.cosmicon.com>  
COSMIC Common Software Measurement International Consortium
- <http://www.esi.es>  
ESI European Software Engineering Institute in Bilbao, Spain
- <http://www.mai-net.org/>  
Network (MAIN) Metrics Associations International
- <http://www.sttf.fi>  
FiSMA Finnish Software Metrics Association
- <http://www.iese.fhg.de>  
IESE Fraunhofer Einrichtung für Experimentelles Software Engineering
- <http://www.isbsg.org.au>  
ISBSG International Software Benchmarking Standards Group, Australia
- <http://www.nesma.nl>  
NESMA Netherlands Software Metrics Association



- <http://www.sei.cmu.edu/>  
SEI Software Engineering Institute Pittsburgh
- <http://www.spr.com/>  
SPR Software Productivity Research by Capers Jones
- <http://fdd.gsfc.nasa.gov/seltext.html>  
SEL Software Engineering Laboratory - NASA-Homepage
- <http://www.vrz.net/stev>  
STEV Vereinigung für Software-Qualitätsmanagement Österreichs
- <http://www.sqs.de>  
SQS Gesellschaft für Software-Qualitätssicherung, Germany
- <http://www.ti.kviv.be>  
TI/KVIV Belgisch Genootschap voor Software Metrics
- <http://www.ukσμα.co.uk>  
UKSMA United Kingdom Software Metrics Association

### **Software Metrics Tools (Overviews and Vendors)**

#### **Tool Listings**

- <http://www.cs.umd.edu/users/cml/resources/cmetrics/>  
C/C++ Metrics Tools by Christopher Lott
- <http://mdmetric.com/>  
Maryland Metrics Tools
- <http://cutter.com/itgroup/reports/function.html>  
Function Point Tools by Carol Dekkers
- <http://user.cs.tu-berlin.de/~fetcke/measurement/products.html>  
Tool overview by Thomas Fetcke
- <http://zing.ncsl.nist.gov/WebTools/tech.html>  
An Overview about Web Metrics Tools

## Tool Vendors

- <http://www.mccabe.com>  
McCabe & Associates
- <http://www.scitools.com>  
Scientific Toolworks Inc.
- <http://zing.ncsl.nist.gov/webmet/>  
Web Metrics
- <http://www.globalintegrity.com/csheets/metself.html>  
Global Integrity
- <http://www.spr.com/>  
Software Productivity Research (SPR)
- <http://jmetric.it.swin.edu.au/products/jmetric/>  
JMetric
- <http://www.imagix.com/products/metrics.html>  
Imagix Power Software
- <http://www.verilogusa.com/home.htm>  
VERILOG (LOGISCOPE)
- <http://www.qsm.com/>  
QSM

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2009

NUMBER 2

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ISSN 1867-9196