

2010 14th International Conference Information Visualisation

(IV 2010)

**London, United Kingdom
26 – 29 July 2010**



**IEEE Catalog Number: CFP1044D-PRT
ISBN: 978-1-4244-7846-0**

Information Visualisation

Table of Contents

| | |
|-------------------------------------|------|
| Preface..... | xiii |
| Acknowledgments..... | xiv |
| Organizing & Liaison Committee..... | xv |
| Program Committee..... | xix |
| Reviewers..... | xxi |

1. Information Visualisation

1.1 Information Visualisation - Theory & Techniques

| | |
|---|----|
| Automatic Application of the Data-State Model in Data-Flow Contexts | 5 |
| <i>Joseph A. Cottam and Andrew Lumsdaine</i> | |
| A Visualization Technique for Access Patterns and Link Structures of Web | |
| Sites | 11 |
| <i>Makiko Kawamoto and Takayuki Itoh</i> | |
| A 3D Visualization Technique for Large Scale Time-Varying Data | 17 |
| <i>Maiko Imoto and Takayuki Itoh</i> | |
| Drawing Clustered Bipartite Graphs in Multi-circular Style | 23 |
| <i>Takao Ito, Kazuo Misue, and Jiro Tanaka</i> | |
| Network Visualization of Human and Machine-Based Educational Standard | |
| Assignment | 29 |
| <i>René F. Reitsma and Anne R. Diekema</i> | |
| The Network Lens: Interactive Exploration of Multivariate Networks Using | |
| Visual Filtering | 35 |
| <i>Ilir Jusufi, Yang Dingjie, and Andreas Kerren</i> | |
| Preserving Coherent Illumination in Style Transfer Functions for Volume | |
| Rendering | 43 |
| <i>Imanol Herrera, Carlos Buchart, and Diego Borro</i> | |
| Extracting Events from Spatial Time Series | 48 |
| <i>Gennady Andrienko, Natalia Andrienko, Martin Mladenov, Michael Mock, and Christian Poelitz</i> | |
| An Interactive Visualization Framework for Time-Series of Web Graphs in a 3D | |
| Environment | 54 |
| <i>Masahiko Itoh, Masashi Toyoda, and Masaru Kitsuregawa</i> | |

| | |
|--|-----|
| Combining Visual Analytics and Content Based Data Retrieval Technology for Efficient Data Analysis | 61 |
| <i>Jose Fernando Rodrigues Jr., Luciana A. S. Romani, Agma Juci Machado Traina, and Caetano Traina Jr.</i> | |
| GVIS: An Integrating Infrastructure for Adaptively Mashing up User Data from Different Sources | 68 |
| <i>Luca Mazzola and Riccardo Mazza</i> | |
| Kinetic Inter-acting: A System for Visual Analysis of Interaction Dynamics | 73 |
| <i>Kristine Deray and Simeon Simoff</i> | |
| Highlighting in Information Visualization: A Survey | 79 |
| <i>Jie Liang and Mao Lin Huang</i> | |
| Polytree Numbering for Citation Networks Visualisation | 86 |
| <i>Alex Logvynovskiy and Mohammad Dastbaz</i> | |
| OWL Ontology Visualization: Graphical Representations of Properties on the Instance Level | 92 |
| <i>Simone Kriglstein</i> | |
| Double Tree: An Advanced KWIC Visualization for Expert Users | 98 |
| <i>Chris Culy and Verena Lyding</i> | |
| Liquid Diagrams: Information Visualisation Gadgets | 104 |
| <i>Keith Andrews and Martin Lessacher</i> | |
| Information Visualization in Facility Location and Vehicle Routing Decisions | 110 |
| <i>Rui Borges Lopes, Beatriz Sousa Santos, Paulo Dias, and Carlos Ferreira</i> | |
| Metric Data Analysis Enhanced through Temporal Visualization | 116 |
| <i>Renato Bueno, Humberto L. Razente, Daniel S. Kaster, Maria Camila N. Barioni, Agma J. M. Traina, and Caetano Traina Jr.</i> | |
| Interaction with Computers Using Mobile Devices | 122 |
| <i>Mariko Sasakura, Shinsuke Fujioka, and Susumu Yamasaki</i> | |
| From Databases to Graph Visualization | 128 |
| <i>Frédéric Gilbert and David Auber</i> | |
| A Theme Landscape for Tagged Data | 134 |
| <i>Evelyn Münster</i> | |
| Peek Brush: A High-Speed Lightweight Ad-Hoc Selection for Multiple Coordinated Views | 140 |
| <i>Wolfgang Berger and Harald Piringer</i> | |

1.2 Information Visualisation - Usability

| | |
|--|-----|
| Visualising Virtual Learning Environments: Case Studies of the Website Exploration Tool | 149 |
| <i>V. Pascual-Cid, L. Vigentini, and M. Quixal</i> | |
| Evaluating Climate Visualization: An Information Visualization Approach | 156 |
| <i>Jimmy Johansson, Tina-Simone Schmid Neset, and Björn-Ola Linnér</i> | |
| A Guide to Scientific Evaluation in Information Visualization | 162 |
| <i>Camilla Forsell</i> | |

| | |
|--|-----|
| Supporting the Analytical Reasoning Process in Maritime Anomaly Detection: Evaluation and Experimental Design | 170 |
| <i>Maria Riveiro and Göran Falkman</i> | |

1.3 Information Visualisation - Applications

| | |
|--|-----|
| Exploring New Ways of Integration, Visualization and Interaction with Geotechnical and Geophysical Data | 181 |
| <i>Vitor Gonçalves, Fernando Almeida, Paulo Dias, and Beatriz Sousa Santos</i> | |
| Associating Avatars with Musical Genres | 186 |
| <i>Jukka Holm, Harri Siirtola, and Lauri Laaksonen</i> | |
| Visualization of Multi-sensory Meeting Information to Support Awareness | 194 |
| <i>Tomi Heimonen, Saily Ovaska, Markku Turunen, Jaakko Hakulinen, Juha-Pekka Rajaniemi, and Kari-Jouko Räihä</i> | |
| Wearing Emotions: Physical Representation and Visualization of Human Emotions Using Wearable Technologies | 200 |
| <i>Salvatore Iaconesi</i> | |
| Dynamic Visualizations for Soccer Statistical Analysis | 207 |
| <i>Adrian Rusu, Doru Stoica, Edward Burns, Benjamin Hamble, Kevin McGarry, and Robert Russell</i> | |
| Visualization of News Access Activity in the SAPO News Website | 213 |
| <i>Rui Raposo, Ana Veloso, Pedro Correia, and Óscar Mealha</i> | |
| Visualisation of Web Based e-Learning Activity | 219 |
| <i>Ana Patrícia Oliveira, Óscar Mealha, and Carlos Santos</i> | |
| GeoVisualisation of SAPO Search Activity | 225 |
| <i>Ana Veloso, Rui Raposo, João Costa, and Óscar Mealha</i> | |

1.4 Information Visualization in Biomedical Informatics

| | |
|--|-----|
| Oncology Lifeline - A Timeline Tool for the Interdisciplinary Management of Breast Cancer Patients in a Surgical Clinic | 233 |
| <i>Brian Drohan, Georges Grinstein, and Kevin Hughes</i> | |
| Real-Time Ray Tracing of Complex Molecular Scenes | 239 |
| <i>Lukas Marsalek, Anna Katharina Dehof, Iliyan Georgiev, Hans-Peter Lenhof, Philipp Slusallek, and Andreas Hildebrandt</i> | |
| Identification, Tracking and Visualization of Platelets in Intravital Microscopy | 246 |
| <i>Joseph Doss, Randal Holloway, Jeremiah Slack, Jennifer Smith, Phillip Kilgore, Urska Cvek, Karen Y. Stokes, and Marjan Trutschl</i> | |
| Interactive Patient Records | 252 |
| <i>Heimo Müller, Stefan Sauer, Kurt Zatloukal, and Thomas Bauernhofer</i> | |
| Preparing, Exploring and Comparing Cancer Simulation Results within a Large Parameter Space | 258 |
| <i>Aran Lunzer, Robert Belleman, Paul Melis, and Georgios Stamatakos</i> | |

1.5 Information Visualisation - Web Visualisation

| | |
|---|-----|
| Semi-automatic Generation of GUIs for RDF Browsing | 267 |
| <i>Maria Teresa Pazienza, Noemi Scarpato, and Armando Stellato</i> | |
| INSPIRE: A New Method of Mapping Information Spaces | 273 |
| <i>Roy A. Ruddle</i> | |
| Visualization of Web Page Content Using Semantic Technologies | 280 |
| <i>Lorand Dali and Dunja Mladenić</i> | |

2. Visual Analytics

2.1 Visual Data Mining and Analytics

| | |
|--|-----|
| Event-Based Analysis of People's Activities and Behavior Using Flickr and Panoramio Geotagged Photo Collections | 289 |
| <i>Slava Kisilevich, Milos Krstajic, Daniel Keim, Natalia Andrienko, and Gennady Andrienko</i> | |
| From Data Realism to Dada Aggregations: Visualizations in Digital Art, Humanities and Popular Culture | 297 |
| <i>Denisa Kera</i> | |
| Visualise Web Usage Mining: Spanning Sequences' Impact on Periodicity Discovery | 301 |
| <i>Ahmed Aburodes Assaid Alkilany</i> | |

2.2 GeoAnalytics

| | |
|--|-----|
| Swedish Road Weather Visualization | 313 |
| <i>Patrik Lundblad, Jonas Thoursie, and Mikael Jern</i> | |
| Taggram: Exploring Geo-data on Maps through a Tag Cloud-Based Visualization | 322 |
| <i>Dinh-Quyen Nguyen and Heidrun Schumann</i> | |
| 3D Edge Bundling for Geographical Data Visualization | 329 |
| <i>Antoine Lambert, Romain Bourqui, and David Auber</i> | |
| A 3D Visualization of Multiple Time Series on Maps | 336 |
| <i>Sidharth Thakur and Andrew J. Hanson</i> | |

3. Knowledge Visualisation

3.1 Knowledge Visualization and Visual Thinking

| | |
|---|-----|
| The Use of Visualization in the Context of Business Strategies: An Experimental Evaluation | 349 |
| <i>Sebastian Kernbach and Martin J. Eppler</i> | |
| Choosing Knowledge Visualizations to Augment Cognition: The Managers' View | 355 |
| <i>Sabrina Bresciani and Martin J. Eppler</i> | |

| | |
|---|-----|
| How Users Perceive and Use Interactive Information Graphics: An Exploratory Study | 361 |
|---|-----|

Michael Burmester, Marcus Mast, Ralph Tille, and Wibke Weber

| | |
|---|-----|
| Drawing Conclusions: Supporting Decision Making through Collaborative Graphic Annotations | 369 |
|---|-----|

Martin J. Eppler and Roland A. Pfister

| | |
|---|-----|
| An Application of Edge Bundling Techniques to the Visualization of Media Analysis Results | 375 |
|---|-----|

Wolfgang Kienreich and Christin Seifert

| | |
|---|-----|
| Visual Intention in Moving Image Editing and Eye-Tracking Methodology. An Exploratory Study | 381 |
|---|-----|

Thorbjörn Swenberg

3.2 Cultural Heritage Knowledge Visualisation

| | |
|---|-----|
| Ancestral Forces in Contemporary Indigenous Australian Women's Art: 3 Case Studies of Multi-dimensional Cultural Heritage Knowledge | 391 |
|---|-----|

Jenefer Marquis and Theodor Wyeld

| | |
|---|-----|
| Re-writing Recent History: Developing a National Reconciliation Pedagogy Using a Video Game for School Age Children | 397 |
|---|-----|

Belinda MacGill, Theodor Wyeld, and Faye Blanch

| | |
|--|-----|
| Conceptualisations of Self in Contemporary Interactive Artwork: A Case Study of Lynette Wallworth's Duality of Light | 403 |
|--|-----|

Christine Nicholls

| | |
|--|-----|
| Immersive Visualization Architectures and Situated Embodiments of Culture and Heritage | 408 |
|--|-----|

Sarah Kenderdine

| | |
|---|-----|
| Embodying Affect: The Stolen Generations, the History Wars and Poles Apart by Indigenous New Media Artist r e a | 415 |
|---|-----|

Christine Nicholls

| | |
|--|-----|
| Database Narratives: Conceptualising Digital Heritage Databases in Remote Aboriginal Communities | 422 |
|--|-----|

Hart Cohen, Rachel Morley, Peter Dallow, and Lisa Kaufmann

4. Design Visualisation

4.1 Design and Aesthetics in Visualisation

| | |
|---|-----|
| Multiple Shape Attributes in Information Visualization: Guidance from Prior Art and Experiments | 433 |
|---|-----|

Richard Brath

| | |
|--|-----|
| AmbientNEWS: Augmenting Information Discovery in Complex Settings through Aesthetic Design | 439 |
|--|-----|

Nina Valkanova, Ayman Moghnieh, Ernesto Arroyo, and Josep Blat

| | |
|--|-----|
| From Data to Knowledge - Visualizations as Transformation Processes within the Data-Information-Knowledge Continuum | 445 |
| <i>Luca Masud, Francesca Valsecchi, Paolo Ciuccarelli, Donato Ricci, and Giorgio Caviglia</i> | |
| The Aesthetic and the Poietic Elements of Information Design | 450 |
| <i>Anna-Lena Carlsson</i> | |
| Guidelines to Visualize Vessels in a Geographic Information System | 455 |
| <i>Dario Rodighiero</i> | |
| A New Paradigm for Visualization and Generating Grid Geometry Art and Beyond | 460 |
| <i>Lin Hsin Hsin</i> | |

4.2 HCI - Interaction Design for Information Visualisations

| | |
|---|-----|
| Hand Motion Recognition and Visualisation for Direct Sign Writing | 467 |
| <i>Gan Lu, Lik-Kwan Shark, Geoff Hall, and Ulrike Zeshan</i> | |
| Wiimote as an Input Device in Google Earth Visualization and Navigation: A User Study Comparing Two Alternatives | 473 |
| <i>Beatriz Sousa Santos, Bruno Prada, Hugo Ribeiro, Paulo Dias, Samuel Silva, and Carlos Ferreira</i> | |
| EMG Biofeedback Based VR System for Hand Rotation and Grasping Rehabilitation | 479 |
| <i>Sha Ma, Martin Varley, Lik-Kwan Shark, and Jim Richards</i> | |

5. Visualization

| | |
|---|-----|
| Molecular Rendering with Medieval and Renaissance Color Theory | 487 |
| <i>Francis T. Marchese and Suzanne M. Marchese</i> | |
| A System for Real-Time Transcoding and Delivery of Video to Smartphones | 494 |
| <i>Lior D. Shefer and Francis T. Marchese</i> | |
| Real-Time Immersive Table Tennis Game for Two Players with Motion Tracking | 500 |
| <i>Yingzhu Li, Lik-Kwan Shark, Sarah Jane Hobbs, and James Ingham</i> | |

5.1 Visualization in Software Engineering

| | |
|--|-----|
| Visual Amortization Analysis of Recompilation Strategies | 509 |
| <i>Stephan Zimmer and Stephan Diehl</i> | |
| Simulation and Visualisation for Electromagnetic Nondestructive Evaluation | 515 |
| <i>Anthony Simm, Ilham Zainal Abidin, Gui Yun Tian, and Wai Lok Woo</i> | |

5.2 Applications of Graph Theory

| | |
|--|-----|
| Living Flows: Enhanced Exploration of Edge-Bundled Graphs Based on GPU-Intensive Edge Rendering | 523 |
| <i>Lambert Antoine, Auber David, and Guy Melançon</i> | |
| Trust Enabled Secure Multiparty Computation | 531 |
| <i>Renren Dong and Ray Kresman</i> | |
| Bobox Model Visualization | 537 |
| <i>Jiří Dokulil and Jana Katreniaková</i> | |
| Challenges and Perspectives of Procedural Modelling and Effects | 543 |
| <i>David Fletcher, Yong Yue, and Majid Al Kader</i> | |
| A Visualisation Technique for the Identification of Security Threats in Networked Systems | 551 |
| <i>Carsten Maple and Valentina Viduto</i> | |

5.3 Geometric Modeling & Imaging

| | |
|---|-----|
| A Wavelet Inpainting by a Tixotrop Model | 559 |
| <i>Mohamed Lakhdar Hadji, Messaoud Maouni, and Fatma Zohra Nouri</i> | |
| Visualization of Positive Data by Rational Cubic Spline Interpolant | 564 |
| <i>Muhammad Sarfraz, Malik Zawwar Hussain, and Tahira Sumbal Shaikh</i> | |
| YACBIR: Yet Another Content Based Image Retrieval System | 570 |
| <i>Samy Ait-Aoudia, Ramdane Mahiou, and Billel Benzaid</i> | |

6. Visualisation in Built & Rural Environments

| | |
|--|-----|
| "Models, Mark-Up, Commentary and Attention" | 579 |
| <i>John Counsell</i> | |
| The Impact of Immersive Virtual Reality on Visualisation for a Design Review in Construction | 585 |
| <i>May Bassanino, Kuo-Cheng Wu, Jialiang Yao, Farzad Khosrowshahi, Terrence Fernando, and Jens Skjærbaek</i> | |
| Zero and Low Carbon Buildings: A Driver for Change in Working Practices and the Use of Computer Modelling and Visualization | 590 |
| <i>Robina Hetherington, Robin Laney, and Stephen Peake</i> | |
| Affective Qualities of an Urban Environment on a Desktop Computer | 597 |
| <i>Joske M. Houtkamp and Mike L. A. Junger</i> | |
| Human Perception, Virtual Reality and the Built Environment | 604 |
| <i>Angie Johnson, Emine M. Thompson, and Kenny R. Coventry</i> | |
| The Management of Sharing, Integrating, Tracking, and Maintaining Data-Sets, is a New and Rather Complex Task | 610 |
| <i>James Harty and Richard Laing</i> | |

7. BioMedical Visualization

| | |
|--|------------|
| Using Web Services as Functional-Level Plug Ins for Interactive 3D Medical Visualisation | 617 |
| <i>Tao Wang, Youbing Zhao, Enjie Liu, Gordon J. Clapworthy, Xia Zhao, Hui Wei, and Feng Dong</i> | |
| Semi-supervised Tissue Segmentation of 3D Brain MR Images | 623 |
| <i>Xiangrong Zhang, Feng Dong, Gordon Clapworthy, Youbing Zhao, and Licheng Jiao</i> | |
| CardioAnalyser: A Software Tool for Segmentation and Analysis of the Left Ventricle from 4D MDCT Images of the Heart | 629 |
| <i>Samuel Silva, Joaquim Madeira, Beatriz Sousa Santos, and Augusto Silva</i> | |
| Visualisation of Left Ventricular Dysfunction in the Virtual Pathological Heart | 635 |
| <i>X. Lin, N. J. B. McFarlane, Y. Zhao, G. J. Clapworthy, F. Dong, and A. Redaelli</i> | |
| Investigating the Trend of Virtual Reality-Based Stroke Rehabilitation Systems | 641 |
| <i>Prashant Prashun, Glyn Hadley, Christos Gatzidis, and Ian Swain</i> | |
| Author Index | 649 |