2014 IEEE Symposium on Visual Languages and Human-Centric Computing

(VL/HCC 2014)

Melbourne, Australia
28 July – 1 August 2014
# Table of Contents

Foreword ...................................................................................................................... vii  
Conference Committees .......................................................................................... ix  
Sponsors ...................................................................................................................... xii  

## Keynotes

- **What is a Good Diagram? (Revisited)** ................................................................. 1  
  *Peter D. Eades*
- **Seeing with Sound and Touch** ........................................................................... 3  
  *Kim Marriott*
- **What do I need? A resource-based perspective on visual communication and interaction** ............. 4  
  *Paolo Bottoni*

## Beyond Textual Coding

- **How Live Coding Affects Developers’ Coding Behavior** ..................................... 5  
  *Jan-Peter Krämer, Joachim Kurz, Thorsten Karrer and Jan Borchers*
- **Envision: A Fast and Flexible Visual Code Editor with Fluid Interactions (Overview)** .......... 9  
  *Dimitar Asenov and Peter Müller*
- **Towards aiding within -patch information foraging by end-user programmers** ............. 13  
  *Balaji Athreya and Christopher Scaffidi*

## Diagrams++

- **Intercepting Dataflow Connections in Diagrams with Inheritance** ....................... 21  
  *Niklas Fors and Görel Hedin*
- **Get Your Directories Right: From Hierarchy Visualization to Hierarchy Manipulation** ........ 25  
  *Rainer Lutz, Daniel Rausch, Fabian Beck and Stephan Diehl*
- **Annotating Spiders with Resource Information** .................................................. 33  
  *Paolo Bottoni, Andrew Fish and Alexander Heußner*
- **Automatic Layout in the Face of Unattached Comments** ...................................... 41  
  *Christoph Daniel Schulze and Reinhard von Hanxleden*

## Tools for Education

- **A Direct Manipulation Language for Explaining Algorithms** ............................... 45  
  *Jeremy Scott, Philip J. Guo and Randall Davis*
- **Real Time Assessment of Computational Thinking** ........................................... 49  
  *Kyu Han Koh, Ashok Basawapatna, Hilarie Nickerson and Alexander Repenning*
- **Teach and Try: A simple interaction technique for exploratory data modelling by end users** .... 53  
  *Advait Sarkar, Alan Blackwell, Mateja Jamnik and Martin Spott*
Principles of a Debugging-First Puzzle Game for Computing Education ..............................................57
Michael Lee, Faezeh Bahmani, Irwin Kwan, Jilian Laferte, Polina Charters, Amber
Horvath, Fanny Luor, Jill Cao, Catherine Law, Michael Beswetherick, Sheridan Long,
Margaret Burnett and Andrew Ko

Navigating and Finding
CodeGraffiti: Using hand-drawn sketches connected to code bases in navigation tasks ..........65
Leonhard Lichtschlag, Lukas Spychalski and Jan Borchers

How Developers Use Multi-Recommendation System in Local Code Search ......................... 69
Xi Ge, David Shepherd, Kostadin Damevski and Emerson Murphy-Hill

Helping Programmers Navigate Code Faster with Patchworks: A Simulation Study ..............77
Austin Z. Henley, Alka Singh, Scott D. Fleming and Maria Luong

Code You Can Use: Searching for web automation scripts based on reusability ...................81
James Admire, Abbas Al Zawwad, Abdulwahab Almorebah, Sanchit Karve and
Christopher Scaffidi

Empirical Field Studies
An Empirical Study to Review and Revise Job Responsibilities of Software Testers ........... 89
Tanjila Kanij, Robert Merkel and John Grundy

On Older Adults in Free/Open Source Software: Reflections of Contributors and
Community Leaders .................................................................................................................93
Jennifer Davidson, Rithika Naik, Ayda Mannan, Amir Azarbakht and Carlos Jensen

A Longitudinal Study of Programmers’ Backtracking ...............................................................101
Youngseok Yoon and Brad A. Myers

Manipulation and Interaction
Clint: a direct manipulation tool for parallelizing compute-intensive program parts ..............109
Oleksandr Zinenko, Stéphane Huot and Cédric Bastoul

Real-Time Continuous Gesture Recognition for Natural Human Computer Interaction ..........113
Ying Yin and Randall Davis

A Human-Centric API for Programming Socially Interactive Robots ................................ 121
James Diprose, Beryl Plimmer, Bruce MacDonald and John Hosking

Domain Specific and Functional Languages
The Design of Naming Features in App Inventor 2 ...............................................................129
Franklyn Turbak, David Wolber and Paul Medlock-Walton

HorusCML: Context-aware Domain Specific Visual Languages Designer ...........................133
Mohamed Almorsy, John Grundy and Ulf Rüegg

Information resources of *AIDA programs .......................................................... 137
Yutaka Watanobe, Nikolay Mirenkov and Haruo Terasaka

Reactive Visual Programs for Computer-Aided Music Composition .......................................141
Jean Bresson
Let’s Hear Both Sides: On Combining Type-Error Reporting Tools

Sheng Chen, Martin Erwig and Karl Smeltzer

Spreadsheets

Embedding Model-Driven Spreadsheet Queries in Spreadsheet Systems

Jácome Cunha, João Paulo Fernandes, Jorge Mendes, Rui Pereira and João Saraiva

Visualizing the Problem Domain for Spreadsheet Users: A Mental Model Perspective

Bennett Kankuzi and Jorma Sajaniemi

Bidirectional Spreadsheet Formulas

Nuno Macedo, Hugo Pacheco, Nuno Rocha Sousa and Alcino Cunha

A Spreadsheet Model for Using Web Service Data

Kerry Chang and Brad Myers

Graduate Consortium

Improving Error Notification Comprehension through Visual Overlays in IDEs

Titus Barik

Enabling the Visualization for Reasoning about Temporal Data

Nikolay Burlutskiy, Miltos Petridis, Andrew Fish and Nour Ali

Measuring and Visualizing Energy Consumption within Software Code

Tiago Carção

Tools for Programming Human Robot Interaction

James Diprose

Towards a Programming Environment that Adaptively Suggests Examples and Corresponding Puzzles Based on Programmer Skill

Kyle Harms

Improving Source Code Navigation with Patchworks

Austin Z. Henley

Towards Crowdsourced Large-Scale Feedback for Novice Programmers

Michelle Ichinco

Enhancing Tools’ Intelligence for Improved Program Analysis Tool Usability

Brittany Johnson

Gidget: An Online Debugging Game for Learning and Engagement in Computing Education

Michael Lee

A Language for Visualization Variation and Transformation

Karl Smeltzer

Behavior-Based Code Search

Sheela Surisetty

Showpieces

CONVErT Meets KIELER: Integrating Advanced Layout Algorithms into By-Example Visualisations

Iman Avazpour, Ulf Rüegg and John Grundy
Temporal Visualization of Collaborative Software Development in FOSS Forks ......................... 201
   Amir Azarbakht

ES-SQL: Visually Querying Spreadsheets .................................................................................. 203
   Jâcome Cunha, João Fernandes, Jorge Mendes, Rui Pereira and João Saraiva

A Notation for Non-Linear Program Edits .............................................................................. 205
   Martin Erwig, Karl Smeltzer and Keying Xu

A Tool for Authoring Programs that Automatically Distribute Feedback to Novice
Programmers .......................................................................................................................... 207
   Michelle Ichinco, Yoanna Dosouto and Caitlin Kelleher

A Domain Terms Visualization Tool for Spreadsheets ............................................................. 209
   Bennett Kankuzi and Jorma Sajaniemi

A Demonstration of Gidget, A Debugging Game for Computing Education ............................ 211
   Michael Lee and Andrew Ko

A Directory Comparison and Manipulation Tool ...................................................................... 213
   Rainer Lutz, Daniel Rausch, Fabian Beck and Stephan Diehl

A Logical Error Detector for Novice PHP Programmers ......................................................... 215
   Tung Nguyen and Caslon Chua

Properties of Euler Diagrams and Graphs in Combination ..................................................... 217
   Mithilesh Sathiyanarayanan, Gem Stapleton, Jim Burton and John Howse

Two Applications for Transient Views in Software Development Environments .................... 219
   Christoph Daniel Schulze, Miro Spönenmann, Christian Schneider and Reinhard Von
   Hanxleden

Networked Livecoding at VL/HCC 2013 .................................................................................... 221
   Benjamin Swift, Henry Gardner and Andrew Sorensen

Layout Requirements of a 3D Molecular Editor Specified with DEViL3D ............................... 223
   Jan Wolter

A Demonstration of Azurite: Backtracking Tool for Programmers ........................................ 225
   YoungSeok Yoon and Brad A. Myers

Readability of a diagrammatic query language ........................................................................ 227
   Martins Zviedris and Renars Liepins

Author Index ............................................................................................................................... 229