

Fifth International Workshop on Software Clones (IWSC 2011)

James R. Cordy
Queen's University, Canada
cordy@cs.queensu.ca

Stanislaw Jarzabek
National University of Singapore, Singapore
dcssj@nus.edu.sg

Katsuro Inoue
Osaka University, Japan
inoue@ist.osaka-u.ac.jp

Rainer Koschke
University of Bremen, Germany
koschke@informatik.uni-bremen.de

ABSTRACT

Software clones are identical or similar pieces of code, design or other artifacts. Clones are known to be closely related to various issues in software engineering, such as software quality, complexity, architecture, refactoring, evolution, licensing, plagiarism, and so on. Various characteristics of software systems can be uncovered through clone analysis, and system restructuring can be performed by merging clones.

The goals of this workshop are to bring together researchers and practitioners from around the world to evaluate the current state of research and applications, discuss common problems, discover new opportunities for collaboration, exchange ideas, envision new areas of research and applications, and explore synergies with similarity analysis in other areas and disciplines.

Categories and Subject Descriptors

D.2.m [Software Engineering]: Miscellaneous—*code clones*;
D.2.7 [Software Engineering]: Distribution, Maintenance, and Enhancement; D.2.8 [Software Engineering]: Metrics

General Terms

Measurement, Experimentation

Keywords

software maintenance, reverse engineering, clone detection, software clones

1. INTRODUCTION

Beginning in 2002, the first edition of the *International Workshop on Detection of Software Clones*, this community began to form itself and to find ways to meet and collaborate. In November 2003, the *Second International Workshop on Software Clones* held at *WCRE 2003* saw a broadening of its scope and participant background. Six years later, in March 2009, the number of participants of the *Third International Workshop on Software Clones* (held in conjunction with *CSMR 2009*) confirmed the interest that code clone research attracts. In recognition of the relevance of clones

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

ICSE '11, May 21–28, 2011, Waikiki, Honolulu, HI, USA
Copyright 2011 ACM 978-1-4503-0445-0/11/05 ...\$10.00.

to the broader software engineering research community, in May 2010 the *Fourth International Workshop on Software Clones* became an ICSE workshop for the first time at ICSE 2010 in Cape Town.

The primary aims of the workshop are to:

- provide a common forum for software clone research and applications
- bring together researchers and practitioners in the field
- clarify and assess the current state of research
- discuss common problems and emerging research directions
- exchange ideas, explore and envision new applications and new areas of research
- discuss and exchange new empirical results, new insights and new approaches
- discover new opportunities for collaboration
- establish a list of new emerging research directions

The expected outcome is a list of open issues that should be addressed in the near future and concrete plans on how to conduct research to address these issues.

2. WORKSHOP THEMES

This workshop is intended as a discussion forum where original and innovative ideas can be openly presented, criticized and refined. It is an explicit goal of this workshop to focus on novel and forward-looking ideas as well as experience and practical applications.

Relevant topics include, but are not limited to:

- Definition of software clones
- Types, distribution, and nature of clones in software
- Causes and effects of clones
- Techniques and algorithms for clone detection, analysis, and management
- Clone and clone pattern visualization
- Tools and systems for detecting and analyzing clones
- Applications of clone analysis
- Clone management
- System architecture and clones
- Effect of clones on system complexity and quality
- Clone analysis in families of similar systems
- Industrial experiences
- Measures of code similarity
- Economic and trade-off models for clone removal
- Evaluation and benchmarking of detection methods
- Licensing and plagiarism issues
- Clone-aware software design and development
- Refactoring through clone analysis

- Raising the level of clone detection and analysis (higher-level clones in models and designs)

And, as a particular focus for IWSC 2011:

- Clone evolution and variation
- Role of clones in software system evolution

Three kinds of papers were sought. Full papers should present novel research ideas and open issues, significant experiences, empirical studies, or important viewpoints on the field. Short position papers are designed to raise new ideas and issues, emphasizing originality and potential to stimulate active discussion. Finally, tool demonstration papers introduce a relevant practical tool and its use.

3. WORKSHOP FORMAT

The workshop will cover a full day of presentations and discussions. Each session will begin with three or four presentations on related topics, followed by an open discussion of the issues raised moderated by the session chair. The discussion will be seeded by questions raised by the presenters, who form the discussion panel. Each presenter is asked to pose the one most important question raised by his or her work, and the question is put to the audience and other panel members for comment (or solution).

4. WORKSHOP ORGANIZATION

Workshop co-organizers

- James R. Cordy, Queen’s University, Canada
- Katsuro Inoue, Osaka University, Japan
- Stanislaw Jarzabek, National University of Singapore
- Rainer Koschke, University of Bremen, Germany

Program Committee

- Giuliano Antoniol (Ecole Polytechnique de Montréal)
- Ira Baxter (Semantic Designs, Inc.)
- James R. Cordy (Queen’s University)
- Daniel M. German (University of Victoria)
- Mike Godfrey (University of Waterloo)
- Nils Göde (University of Bremen)
- Katsuro Inoue (Osaka University)
- Stanislaw Jarzabek (National University of Singapore)
- Elmar Juergens (Technical University of Munich)
- Toshihiro Kamiya (Future University-Hakodate)
- Sung Kim (Hong Kong Univ. of Science & Technology)
- Rainer Koschke (University of Bremen)
- Jens Krinke (University College London)
- Angela Lozano (Université Catholique de Louvain)
- Chanchal K. Roy (University of Saskatchewan)
- Andrew Walenstein (University of Louisiana at Lafayette)
- Xing Zhenchang (National University of Singapore)

ACKNOWLEDGEMENTS

The organizers wish to thank all of the reviewers and the authors for their contributions to this workshop.

5. ACCEPTED PAPERS

This year’s workshop received a total of 23 submissions. All submissions were formally reviewed by at least three members of the program committee according to the criteria outlined above, and following a round of open discussion the following papers were accepted for the workshop.

5.1 Full Papers

- [1] Hamid Basit, Usman Ali and Stan Jarzabek, “Viewing Simple Clones from a Structural Clones Perspective”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [2] Eunjong Choi, Norihiro Yoshida, Takashi Ishio, Katsuro Inoue and Tateki Sano, “Extracting Code Clones for Refactoring Using Combinations of Clone Metrics”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [3] Nils Göde and Jan Harder, “Oops! ... I Changed It Again”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [4] Benjamin Hummel, Elmar Juergens and Daniela Steidl, “Index-Based Model Clone Detection”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [5] Jens Krinke, “Is Cloned Code older than Non-Cloned Code?”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [6] Thierry Lavoie and Ettore Merlo, “Automated Type III Clone Oracle Using Levenshtein Metric”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [7] Doug Martin and James R. Cordy, “Analyzing Web Service Similarity Using Contextual Clones”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [8] Philipp Schugerl, “Scalable Clone Detection Using Description Logic”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [9] Robert Tairas, Ferosh Jacob and Jeff Gray, “Representing Clones in a Localized Manner”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.

5.2 Position Papers

- [1] Jeffrey Carver, Debarshi Chatterji and Nicholas Kraft, “On the Need for Human-based Empirical Validation of Techniques and Tools for Code Clone Analysis”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [2] Yingnong Dang, Song Ge and Dongmei Zhang, “Code Clone Detection Experience at Microsoft”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [3] Mike Godfrey, Julius Davis, Daniel German and Abram Hindle, “Determining the provenance of software artifacts”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [4] Elmar Juergens, “Research in Cloning Beyond Code: A First Roadmap”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [5] Toshihiro Kamiya, “How Code Skips Over Revisions”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [6] Ripon Saha, Chanchal K. Roy and Kevin Schneider, “Visualizing the Evolution of Code Clones”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [7] Antonella Santone, “Clone detection through Process Algebras and Java Bytecode”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [8] Minhaz Zibran and Chanchal Roy, “Towards Flexible Code Clone Detection, Management, and Refactoring in IDE”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.

5.3 Tool Demonstrations

- [1] Muhammad Asaduzzaman, Chanchal K. Roy and Kevin Schneider, “VisCad: Flexible Code Clone Analysis Support For NiCad”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [2] James R. Cordy, “Live Scatterplots”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [3] Jan Harder and Nils Göde, “Efficiently Handling Clone Data: RCF and cyclone”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.
- [4] Yinxing Xue, Zhenchang Xing and Stan Jarzabek, “CloneDiff: Semantic Differencing of Clones”, In *Proc. Fifth Intl. Workshop on Software Clones*, 2011.