

VU Research Portal

Supporting Architecture Evolution by Mining Software Repositories

Vanya, A.

2012

document version

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

citation for published version (APA)

Vanya, A. (2012). *Supporting Architecture Evolution by Mining Software Repositories*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

E-mail address:

vuresearchportal.ub@vu.nl

Bibliography

Prefuse information visualization toolkit, 2009. URL <http://prefuse.org/>.

Rui Abreu, Peter Zoetewij, and Arjan J. C. van Gemund. An evaluation of similarity coefficients for software fault localization. In *Proceedings of the 12th Pacific Rim International Symposium on Dependable Computing (PRDC '06)*, pages 39–46, Washington, DC, USA, 2006. IEEE Computer Society. ISBN 0-7695-2724-8. doi: <http://dx.doi.org/10.1109/PRDC.2006.18>.

Abdulkareem Alali, Huzefa Kagdi, and Jonathan I. Maletic. What's a typical commit? a characterization of open source software repositories. In *ICPC '08: Procs. of the International Conference on Program Comprehension*, pages 182–191, Washington, DC, USA, 2008. IEEE Computer Society.

Nicolas Anquetil and Timothy C. Lethbridge. Recovering software architecture from the names of source files. *Journal of Software Maintenance*, 11(3):201–221, 1999. ISSN 1040-550X. doi: [http://dx.doi.org/10.1002/\(SICI\)1096-908X\(199905/06\)11:3<201::AID-SMR192>3.0.CO;2-1](http://dx.doi.org/10.1002/(SICI)1096-908X(199905/06)11:3<201::AID-SMR192>3.0.CO;2-1).

Giuliano Antoniol, Vincenzo Fabio Rollo, and Gabriele Venturi. Detecting groups of co-changing files in CVS repositories. In *Proceedings of the 8th International Workshop on Principles of Software Evolution (IWPSE '05)*, pages 23–32, Washington, DC, USA, 2005. IEEE Computer Society. ISBN 0-7695-2349-8. doi: <http://dx.doi.org/10.1109/IWPSE.2005.11>.

Trosky B. Callo Arias, Paris Avgeriou, and Pierre America. Analyzing the actual execution of a large software-intensive system for determining dependencies. In *Proceedings of the 15th Working Conference on Reverse Engineering (WCRE '08)*, pages 49–58, Washington, DC, USA, 2008. IEEE Computer Society. ISBN 978-0-7695-3429-9. doi: <http://dx.doi.org/10.1109/WCRE.2008.11>.

Muhammad Ali Babar, Lianping Chen, and Forrest Shull. Managing variability in software product lines. *IEEE Software*, 27:89–91, 94, 2010. ISSN 0740-7459. doi: <http://doi.ieeecomputersociety.org/10.1109/MS.2010.77>.

Nathan Baddoo and Tracy Hall. De-motivators for software process improvement: an analysis of practitioners' views. *Journal of Systems and Software*, 66(1):23–33, 2003. ISSN 0164-1212. doi: [http://dx.doi.org/10.1016/S0164-1212\(02\)00060-2](http://dx.doi.org/10.1016/S0164-1212(02)00060-2).

Thomas Ball, Jung min Kim, Adam A. Porter, and Harvey P. Siy. If your version control system could talk. In *Proceedings of the ICSE '97 Workshop on Process Modelling and Empirical Studies of Software Engineering*, 1997.

BIBLIOGRAPHY

- Richard L. Baskerville. Investigating information systems with action research. *Commun. AIS*, 2(19):4, 1999.
- Len Bass, Paul Clements, and Rick Kazman. *Software Architecture in Practice, Second Edition*. Addison-Wesley Professional, April 2003. ISBN 0321154959.
- Dirk Beyer and Ahmed E. Hassan. Animated visualization of software history using evolution storyboards. In *Proceedings of the 13th Working Conference on Reverse Engineering (WCRE '06)*, pages 199–210, Washington, DC, USA, 2006. IEEE Computer Society. ISBN 0-7695-2719-1. doi: <http://dx.doi.org/10.1109/WCRE.2006.14>.
- Dirk Beyer and Andreas Noack. Clustering software artifacts based on frequent common changes. In *Proceedings of the 13th International Workshop on Program Comprehension (IWPC '05)*, pages 259–268, Washington, DC, USA, 2005. IEEE Computer Society. ISBN 0-7695-2254-8. doi: <http://dx.doi.org/10.1109/WPC.2005.12>.
- Robert Brcina, Stephan Bode, and Matthias Riebisch. Optimisation process for maintaining evolvability during software evolution. In *Proceedings of the 2009 16th Annual IEEE International Conference and Workshop on the Engineering of Computer Based Systems (ECBS '09)*, pages 196–205, Washington, DC, USA, 2009. IEEE Computer Society. ISBN 978-0-7695-3602-6. doi: <http://dx.doi.org/10.1109/ECBS.2009.20>.
- Hongyu Pei Breivold, Ivica Crnkovic, and Peter J. Eriksson. Analyzing software evolvability. In *Proceedings of the 2008 32nd Annual IEEE International Computer Software and Applications Conference (COMPSAC '08)*, pages 327–330, Washington, DC, USA, 2008. IEEE Computer Society. ISBN 978-0-7695-3262-2. doi: <http://dx.doi.org/10.1109/COMPSAC.2008.50>.
- Silvia Breu. Extending dynamic aspect mining with static information. In *Proceedings of the Fifth IEEE International Workshop on Source Code Analysis and Manipulation (SCAM '05)*, pages 57–65, Washington, DC, USA, 2005. IEEE Computer Society. ISBN 0-7695-2292-0. doi: <http://dx.doi.org/10.1109/SCAM.2005.9>.
- Silvia Breu and Thomas Zimmermann. Mining aspects from version history. In *Proceedings of the 21st IEEE/ACM International Conference on Automated Software Engineering (ASE '06)*, pages 221–230, Washington, DC, USA, 2006. IEEE Computer Society. ISBN 0-7695-2579-2. doi: <http://dx.doi.org/10.1109/ASE.2006.50>.
- Christine V. Bullen and John F. Rockart. A primer on critical success factors. Working papers 1220-81. Report (Alfred P. Sloan School of Management. Center for Information Systems Research) ; no. 69., Massachusetts Institute of Technology (MIT), Sloan School of Management, 1981. URL <http://econpapers.repec.org/RePEc:mit:sloanp:1988>.
- Richard A. Caralli. The critical success factor method: Establishing a foundation for enterprise security management. Technical Report CMU/SEI-2004-TR-010, Software Engineering Institute, Carnegie Mellon University, Pittsburgh, July 2004.

- Paul Clements, Rick Kazman, Mark Klein, Divya Devesh, Shivani Reddy, and Prageti Verma. The duties, skills, and knowledge of software architects. In *Proceedings of the Sixth Working IEEE/IFIP Conference on Software Architecture (WICSA '07)*, page 20, Washington, DC, USA, 2007. IEEE Computer Society. ISBN 0-7695-2744-2. doi: <http://dx.doi.org/10.1109/WICSA.2007.41>.
- S. Cook, H. Ji, and R. Harrison. Software evolution and software evolvability, 2000. URL citeseer.ist.psu.edu/cook00software.html.
- Juliet Corbin and Anselm Strauss. Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1):3–21, 1990.
- Marco D'Ambros, Michele Lanza, and Mircea Lungu. Visualizing co-change information with the evolution radar. *IEEE Transactions on Software Engineering*, 35(5):720–735, 2009. ISSN 0098-5589. doi: <http://doi.ieeeecomputersociety.org/10.1109/TSE.2009.17>.
- Christian Del Rosso. Comprehend and analyze knowledge networks to improve software evolution. *Journal of Software Maintenance and Evolution*, 21(3):189–215, 2009. ISSN 1532-060X. doi: <http://dx.doi.org/10.1002/smr.v21:3>.
- Bart Du Bois, Serge Demeyer, and Jan Verelst. Refactoring: Improving coupling and cohesion of existing code. In *Proceedings of the 11th Working Conference on Reverse Engineering (WCRE '04)*, pages 144–151, Washington, DC, USA, 2004. IEEE Computer Society. ISBN 0-7695-2243-2.
- Jacky Estublier, David Leblang, André van der Hoek, Reidar Conradi, Geoffrey Clemm, Walter Tichy, and Darcy Wiborg-Weber. Impact of software engineering research on the practice of software configuration management. *ACM Transactions on Software Engineering Methodology*, 14(4):383–430, 2005a. ISSN 1049-331X. doi: <http://doi.acm.org/10.1145/1101815.1101817>.
- Jacky Estublier, David Leblang, André van der Hoek, Reidar Conradi, Geoffrey Clemm, Walter Tichy, and Darcy Wiborg-Weber. Impact of software engineering research on the practice of software configuration management. *ACM Trans. Softw. Eng. Methodol.*, 14(4):383–430, 2005b. ISSN 1049-331X. doi: <http://doi.acm.org/10.1145/1101815.1101817>.
- Tie Feng, Jiachen Zhang, Hongyuan Wang, and Xian Wang. Software design improvement through anti-patterns identification. In *Proceedings of the 20th IEEE International Conference on Software Maintenance (ICSM '04)*, page 524, Washington, DC, USA, 2004. IEEE Computer Society. ISBN 0-7695-2213-0.
- Michael Fischer and Harald Gall. EvoGraph: A lightweight approach to evolutionary and structural analysis of large software systems. In *Proceedings of the 13th Working Conference on Reverse Engineering (WCRE '06)*, pages 179–188, Washington, DC, USA, 2006. IEEE Computer Society. ISBN 0-7695-2719-1. doi: <http://dx.doi.org/10.1109/WCRE.2006.26>.
-

BIBLIOGRAPHY

- Michael Fischer, Martin Pinzger, and Harald Gall. Populating a release history database from version control and bug tracking systems. In *ICSM '03: Procs. of the International Conference on Software Maintenance*, page 23, 2003a.
- Michael Fischer, Martin Pinzger, and Harald Gall. Populating a release history database from version control and bug tracking systems. In *ICSM '03: Procs. of the International Conference on Software Maintenance*, page 23, 2003b.
- Michael Fischer, Johann Oberleitner, Jacek Ratzinger, and Harald Gall. Mining evolution data of a product family. *SIGSOFT Softw. Eng. Notes*, 30(4):1–5, 2005. ISSN 0163-5948. doi: <http://doi.acm.org/10.1145/1082983.1083145>.
- Harald Gall, Karin Hajek, and Mehdi Jazayeri. Detection of logical coupling based on product release history. In *Proceedings of the International Conference on Software Maintenance (ICSM '98)*, pages 190–198, Washington, DC, USA, 1998a. IEEE Computer Society. ISBN 0-8186-8779-7.
- Harald Gall, Karin Hajek, and Mehdi Jazayeri. Detection of logical coupling based on product release history. In *Proceedings of the International Conference on Software Maintenance (ICSM '98)*, page 190, Washington, DC, USA, 1998b. IEEE Computer Society. ISBN 0-8186-8779-7.
- Harald Gall, Mehdi Jazayeri, and Jacek Krajewski. CVS release history data for detecting logical couplings. In *Proceedings of the 6th International Workshop on Principles of Software Evolution (IWPSE '03)*, page 13, Washington, DC, USA, 2003. IEEE Computer Society. ISBN 0-7695-1903-2.
- Daniel M. German. An empirical study of fine-grained software modifications. *Empirical Softw. Eng.*, 11(3):369–393, 2006. ISSN 1382-3256. doi: <http://dx.doi.org/10.1007/s10664-006-9004-6>.
- T. Gîrba, A. Kuhn, M. Seeberger, and S. Ducasse. How developers drive software evolution. In *Proceedings of the Eighth International Workshop on Principles of Software Evolution*, pages 113–122, 5-6 Sept. 2005. doi: 10.1109/IWPSE.2005.21.
- Tudor Gîrba, Stéphane Ducasse, and Michele Lanza. Yesterday's weather: Guiding early reverse engineering efforts by summarizing the evolution of changes. In *Proceedings of the 20th IEEE International Conference on Software Maintenance (ICSM '04)*, pages 40–49. IEEE Computer Society, 2004. ISBN 0-7695-2213-0.
- Tudor Gîrba, Stéphane Ducasse, Adrian Kuhn, Radu Marinescu, and Rațiu Daniel. Using concept analysis to detect co-change patterns. In *Ninth international workshop on Principles of software evolution (IWPSE '07)*, pages 83–89, New York, NY, USA, 2007. ACM. ISBN 978-1-59593-722-3. doi: <http://doi.acm.org/10.1145/1294948.1294970>.

- Michael W. Godfrey, Ahmed E. Hassan, James Herbsleb, Gail C. Murphy, Martin Robillard, Prem Devanbu, Audris Mockus, Dewayne E. Perry, and David Notkin. Future of mining software archives: A roundtable. *IEEE Softw.*, 26(1):67–70, 2009. ISSN 0740-7459. doi: <http://dx.doi.org/10.1109/MS.2009.10>.
- Orla Greevy, Stéphane Ducasse, and Tudor Girba. Analyzing feature traces to incorporate the semantics of change in software evolution analysis. In *Proceedings of the 21st IEEE International Conference on Software Maintenance (ICSM '05)*, pages 347–356, Washington, DC, USA, 2005. IEEE Computer Society. ISBN 0-7695-2368-4. doi: <http://dx.doi.org/10.1109/ICSM.2005.22>.
- Tracy Hall and Norman Fenton. Implementing effective software metrics programs. *IEEE Software*, 14(2):55–65, 1997. ISSN 0740-7459. doi: <http://dx.doi.org/10.1109/52.582975>.
- Noriko Hanakawa. Visualization for software evolution based on logical coupling and module coupling. In *Proceedings of the 14th Asia-Pacific Software Engineering Conference (APSEC '07)*, pages 214–221, Washington, DC, USA, 2007. IEEE Computer Society. ISBN 0-7695-3057-5. doi: <http://dx.doi.org/10.1109/APSEC.2007.102>.
- David Harel. Statecharts in the Making: A Personal Account. *Communications of the ACM*, 52:67–75, 2009.
- Ahmed E. Hassan and Richard C. Holt. Predicting change propagation in software systems. In *Proceedings of the 20th IEEE International Conference on Software Maintenance (ICSM '04)*, pages 284–293, Washington, DC, USA, 2004. IEEE Computer Society. ISBN 0-7695-2213-0.
- A. Hindle, Zhen Ming Jiang, W. Koleilat, M.W. Godfrey, and R.C. Holt. YARN: Animating software evolution. In *Proceedings of the 4th IEEE International Workshop on Visualizing Software for Understanding and Analysis (VISSOFT '07)*, pages 129–136, June 2007. doi: [10.1109/VISSOFT.2007.4290711](http://dx.doi.org/10.1109/VISSOFT.2007.4290711).
- Kevin Hoffman and Patrick Eugster. Towards reusable components with aspects: an empirical study on modularity and obliviousness. In *Proceedings of the 30th international conference on Software engineering (ICSE '08)*, pages 91–100, New York, NY, USA, 2008. ACM. ISBN 978-1-60558-079-1. doi: <http://doi.acm.org/10.1145/1368088.1368102>.
- Christine Hofmeister, Robert Nord, and Dilip Soni. *Applied software architecture*. Addison-Wesley Longman Publishing Co., Inc., Boston, MA, USA, 2000. ISBN 0-201-32571-3.
- Sunny Huynh and Yuanfang Cai. An evolutionary approach to software modularity analysis. In *Proceedings of the First International Workshop on Assessment of Contemporary Modularization Techniques (ACoM '07)*, page 6, Washington, DC, USA, 2007. IEEE Computer Society. ISBN 0-7695-2967-4. doi: <http://dx.doi.org/10.1109/ACOM.2007.1>.
- IEEE. Ieee standard glossary of software engineering terminology, 1990.
-

BIBLIOGRAPHY

- M. Jaring, R.L. Krikhaar, and J. Bosch. Representing variability in a family of MRI scanners. *Software - Practice and Experience*, 34(1):69–100, 2004.
- Huzefa Kagdi, Michael L. Collard, and Jonathan I. Maletic. A survey and taxonomy of approaches for mining software repositories in the context of software evolution. *J. Softw. Maint. Evol.*, 19(2):77–131, 2007a. ISSN 1532-060X. doi: <http://dx.doi.org/10.1002/smr.344>.
- Huzefa Kagdi, Michael L. Collard, and Jonathan I. Maletic. A survey and taxonomy of approaches for mining software repositories in the context of software evolution. *Journal of Software Maintenance and Evolution*, 19(2):77–131, 2007b. ISSN 1532-060X.
- Huzefa Kagdi, Jonathan I. Maletic, and Bonita Sharif. Mining software repositories for traceability links. In *Proceedings of the 15th IEEE International Conference on Program Comprehension (ICPC '07)*, pages 145–154, Washington, DC, USA, 2007c. IEEE Computer Society. ISBN 0-7695-2860-0.
- Mik Kerstin and Gail C. Murphy. Using task context to improve programmer productivity. In *Procs. of the International Symposium on Foundations of Software Engineering (SIGSOFT '06/FSE-14)*, pages 1–11, New York, 2006. ACM.
- Sunghun Kim, Thomas Zimmermann, Kai Pan, and E. James Jr. Whitehead. Automatic identification of bug-introducing changes. In *Proceedings of the 21st IEEE/ACM International Conference on Automated Software Engineering (ASE '06)*, pages 81–90, Washington, DC, USA, 2006. IEEE Computer Society. ISBN 0-7695-2579-2. doi: <http://dx.doi.org/10.1109/ASE.2006.23>.
- Sunghun Kim, E. James Whitehead Jr., and Yi Zhang. Classifying software changes: Clean or buggy? *IEEE Transactions on Software Engineering*, 34(2):181–196, 2008.
- B.A. Kitchenham, S.L. Pfleeger, D.C. Hoaglin, and J. Rosenberg. Preliminary Guidelines for Empirical Research in Software Engineering. *IEEE Transactions on Software Engineering*, 28(8):721–734, 2002.
- Adrian Kuhn, Stéphane Ducasse, and Tudor Gîrba. Enriching reverse engineering with semantic clustering. In *Proceedings of the 12th Working Conference on Reverse Engineering (WCRE '05)*, pages 133–142, Washington, DC, USA, 2005. IEEE Computer Society. ISBN 0-7695-2474-5. doi: <http://dx.doi.org/10.1109/WCRE.2005.16>.
- M M. Lehman, J F. Ramil, P D. Wernick, D E. Perry, and W M. Turski. Metrics and laws of software evolution - the nineties view. In *Proceedings of the 4th International Symposium on Software Metrics (METRICS '97)*, pages 20–32, Washington, DC, USA, 1997. IEEE Computer Society. ISBN 0-8186-8093-8.
- Meir M. Lehman. On understanding laws, evolution, and conservation in the large-program life cycle. *Journal of Systems and Software*, 1:213–221, 1980.

- Kurt R. Linberg. Software developer perceptions about software project failure: a case study. *Journal of Systems and Software*, 49(2-3):177–192, 1999. ISSN 0164-1212. doi: [http://dx.doi.org/10.1016/S0164-1212\(99\)00094-1](http://dx.doi.org/10.1016/S0164-1212(99)00094-1).
- Mircea Lungu and Michele Lanza. Exploring inter-module relationships in evolving software systems. In *Proceedings of the 11th European Conference on Software Maintenance and Reengineering (CSMR '07)*, pages 91–102, Washington, DC, USA, 2007. IEEE Computer Society. ISBN 0-7695-2802-3. doi: <http://dx.doi.org/10.1109/CSMR.2007.24>.
- Onaiza Maqbool and Haroon Babri. Hierarchical clustering for software architecture recovery. *IEEE Transactions on Software Engineering*, 33(11):759–780, 2007.
- Andrew McNair, Daniel M. German, and Jens Weber-Jahnke. Visualizing software architecture evolution using change-sets. In *Proceedings of the 14th Working Conference on Reverse Engineering (WCRE '07)*, pages 130–139, Washington, DC, USA, 2007. IEEE Computer Society. ISBN 0-7695-3034-6.
- Alok Mehta and George T. Heineman. Evolving legacy system features into fine-grained components. In *Proceedings of the 24th International Conference on Software Engineering (ICSE '02)*, pages 417–427, New York, NY, USA, 2002. ACM Press. ISBN 1-58113-472-X. doi: <http://doi.acm.org/10.1145/581339.581391>.
- Tom Mens, Michel Wermelinger, St'ephane Ducasse, Serge Demeyer, Robert Hirschfeld, and Mehdi Jazayeri. Challenges in software evolution. In *Proc. Int. Workshop on Principles of Software Evolution (IWPSE 2005)*, 2005.
- Tom Mens, Yann-Gael Gueheneuc, Juan Fernandez-Ramil, and Maja D'Hondt. Guest editors' introduction: Software evolution. *IEEE Software*, 27:22–25, 2010. ISSN 0740-7459. doi: <http://doi.ieeecomputersociety.org/10.1109/MS.2010.100>.
- Brian S. Mitchell and Spiros Mancoridis. On the evaluation of the bunch search-based software modularization algorithm. *Soft Computing*, 12(1):77–93, 2007. ISSN 1432-7643. doi: <http://dx.doi.org/10.1007/s00500-007-0218-3>.
- Audris Mockus and Lawrence G. Votta. Identifying reasons for software changes using historic databases. In *ICSM '00: Proceedings of the International Conference on Software Maintenance (ICSM'00)*, page 120, Washington, DC, USA, 2000. IEEE Computer Society. ISBN 0-7695-0753-0.
- Raimund Moser, Witold Pedrycz, and Giancarlo Succi. A comparative analysis of the efficiency of change metrics and static code attributes for defect prediction. In *Proceedings of the 30th International Conference on Software Engineering (ICSE '08)*, pages 181–190, New York, NY, USA, 2008. ACM. ISBN 978-1-60558-079-1.
- Frank Mulder and Andy Zaidman. Identifying cross-cutting concerns using software repository mining. In *Proceedings of the Joint ERCIM Workshop on Software Evolution*

BIBLIOGRAPHY

- (EVOL) and International Workshop on Principles of Software Evolution (IWPSE), IWPSE-EVOL '10, pages 23–32, New York, NY, USA, 2010. ACM. ISBN 978-1-4503-0128-2. doi: <http://doi.acm.org/10.1145/1862372.1862381>. URL <http://doi.acm.org/10.1145/1862372.1862381>.
- Hausi A. Müller and K. Klashinsky. Rigi – a system for programming-in-the-large. In *Proceedings International Conference on Software Engineering*, pages 80–86. IEEE Computer Society, 1988.
- Mahmood Niazi, David Wilson, and Didar Zowghi. Critical success factors for software process improvement implementation: an empirical study. *Software Process: Improvement and Practice*, 11(2):193–211, 2006.
- Masao Ohira, Naoki Ohsugi, Tetsuya Ohoka, and Ken-ichi Matsumoto. Accelerating cross-project knowledge collaboration using collaborative filtering and social networks. In *Proceedings of the 2005 international workshop on Mining software repositories (MSR '05)*, pages 1–5, New York, NY, USA, 2005. ACM. ISBN 1-59593-123-6. doi: <http://doi.acm.org/10.1145/1083142.1083163>.
- T.J. Ostrand and E.J. Weyuker. A tool for mining defect-tracking systems to predict fault-prone files. In *Proceedings of the 1st International Workshop on Mining Software Repositories (MSR '04)*, pages 85–89, 2004.
- D. L. Parnas. On the criteria to be used in decomposing systems into modules. *Communications of ACM*, 15(12):1053–1058, December 1972. ISSN 0001-0782. doi: <http://doi.acm.org/10.1145/361598.361623>.
- D. Perry, A.A. Porter, and L. Votta. Empirical Studies of Software: A Roadmap. In A. Finkelstein, editor, *The Future of Software Engineering*, pages 345–355. IEEE Computer Society, 2000.
- Martin Pinzger, Harald Gall, Michael Fischer, and Michele Lanza. Visualizing multiple evolution metrics. In *Proceedings of the 2005 ACM symposium on Software visualization (SoftVis '05)*, pages 67–75, New York, NY, USA, 2005. ACM. ISBN 1-59593-073-6. doi: <http://doi.acm.org/10.1145/1056018.1056027>.
- Martin Pinzger, Katja Gräfenhain, Patrick Knab, and Harald C. Gall. A Tool for Visual Understanding of Source Code Dependencies. In *Proceedings 16th IEEE International Conference on Software Comprehension*, pages 254–259. IEEE Computer Society, 2008.
- Sarah Rastkar and Gail C. Murphy. On what basis to recommend: Changesets or interactions? In *Proceedings of the 2009 International Workshop on Mining Software Repositories (MSR '09)*, pages 155–158, Los Alamitos, CA, USA, 2009. IEEE Computer Society. ISBN 978-1-4244-3493-0.

- Jacek Ratzinger, Michael Fischer, and Harald Gall. Improving evolvability through refactoring. In *Proceedings of the 2005 international workshop on Mining software repositories (MSR '05)*, pages 1–5, New York, NY, USA, 2005a. ACM. ISBN 1-59593-123-6. doi: <http://doi.acm.org/10.1145/1083142.1083155>.
- Jacek Ratzinger, Michael Fischer, and Harald Gall. EvoLens: Lens-view visualizations of evolution data. In *Proceedings of the 8th International Workshop on Principles of Software Evolution (IWPSE '05)*, pages 103–112, Washington, DC, USA, 2005b. IEEE Computer Society. ISBN 0-7695-2349-8. doi: <http://dx.doi.org/10.1109/IWPSE.2005.16>.
- Siti Rochimah, Wan M. N. Wan Kadir, and Abdul H. Abdullah. An evaluation of traceability approaches to support software evolution. In *Proceedings of the International Conference on Software Engineering Advances (ICSEA '07)*, page 19, Washington, DC, USA, 2007. IEEE Computer Society. ISBN 0-7695-2937-2. doi: <http://dx.doi.org/10.1109/ICSEA.2007.17>.
- Robert W. Schwanke. An intelligent tool for re-engineering software modularity. In *Proceedings of the 13th international conference on Software engineering (ICSE '91)*, pages 83–92, Los Alamitos, CA, USA, 1991. IEEE Computer Society Press. ISBN 0-89791-391-4.
- Jelber Sayyad Shirabad, Timothy C. Lethbridge, and Stan Matwin. Mining the maintenance history of a legacy software system. In *Proceedings of the International Conference on Software Maintenance (ICSM '03)*, page 95, Washington, DC, USA, 2003. IEEE Computer Society. ISBN 0-7695-1905-9.
- Steve D. Suh and Iulian Neamtiu. Studying software evolution for taming software complexity. In *Proceedings of the 21st Australian Software Engineering Conference (ASWEC '10)*, pages 3–12, Los Alamitos, CA, USA, 2010. IEEE Computer Society.
- P. Tarr, H. Ossher, W. Harrison, and Jr. S.M. Sutton. N Degrees of separation: Multi-dimensional separation of concerns. In *Proceedings 21st International Conference on Software Engineering (ICSE 21)*, pages 107–119. IEEE Computer Society, 1999.
- Christoph Treude and Margaret-Anne Storey. Concernlines: A timeline view of co-occurring concerns. In *Proceedings of the 2009 IEEE 31st International Conference on Software Engineering (ICSE '09)*, pages 575–578, Washington, DC, USA, 2009. IEEE Computer Society. ISBN 978-1-4244-3453-4. doi: <http://dx.doi.org/10.1109/ICSE.2009.5070559>.
- R C Tryan. *Cluster Analysis*. Edwards Brothers, Ann Arbor, 1939.
- Piërrre van de Laar. On the transfer of evolutionary couplings to industry. In Michael W. Godfrey and Jim Whitehead, editors, *Proceedings of the 2009 International Workshop on Mining Software Repositories (MSR '09)*, pages 187–190. IEEE Computer Society, 2009. ISBN 978-1-4244-3493-0.
- Pierre van de Laar, Pierre America, Joland Rutgers, Sjr van Loo, Gerrit Muller, Teade Punter, and D. Watts. The Darwin project: Evolvability of software intensive systems. In *Workshop*

BIBLIOGRAPHY

- on Software Evolvability at International Conference on Software Maintenance*, pages 48–53, 2007.
- Frank J. van der Linden and Jürgen K. Müller. Creating architectures with building blocks. *IEEE Softw.*, 12(6):51–60, 1995. ISSN 0740-7459. doi: <http://dx.doi.org/10.1109/52.469760>.
- Adam Vanya, Lennart Hoffland, Steven Klusener, Piërre van de Laar, and Hans van Vliet. Assessing software archives with evolutionary clusters. In *Proceedings of the 2008 The 16th IEEE International Conference on Program Comprehension (ICPC '08)*, pages 192–201, Washington, DC, USA, 2008. IEEE Computer Society. ISBN 978-0-7695-3176-2. doi: <http://dx.doi.org/10.1109/ICPC.2008.34>.
- Adam Vanya, Steven Klusener, Nico van Rooijen, and Hans van Vliet. Characterizing evolutionary clusters. In *Proceedings of the 16th Working Conference on Reverse Engineering (WCRE '09)*, Lille, Frans, October 2009. IEEE Computer Society.
- Adam Vanya, Rahul Premraj, and Hans van Vliet. Interactive Exploration of Co-evolving Software Entities. In *Proceedings of the 14th European Conference on Software Maintenance and Reengineering (CSMR 2010)*, to appear, 2010.
- Adam Vanya, Rahul Premraj, and Hans van Vliet. Approximating Change Sets at Philips Healthcare: A Case Study. In *Proceedings of the Conference on Software Maintenance and Reengineering (CSMR 2011)*. IEEE Computer Society, 2011.
- Lucian Voinea, Alex Telea, and Jarke J. van Wijk. CVSScan: visualization of code evolution. In *Proceedings of the 2005 ACM symposium on Software visualization (SoftVis '05)*, pages 47–56, New York, NY, USA, 2005. ACM. ISBN 1-59593-073-6. doi: <http://doi.acm.org/10.1145/1056018.1056025>.
- Peter Weissgerber, Mathias Pohl, and Michael Burch. Visual data mining in software archives to detect how developers work together. In *MSR '07: Proceedings of the Fourth International Workshop on Mining Software Repositories*, page 9, Washington, DC, USA, 2007. IEEE Computer Society.
- Andreas Wierda, Eric Dortmans, and Lou Lou Somers. Using version information in architectural clustering - a case study. In *Proceedings of the Conference on Software Maintenance and Reengineering (CSMR '06)*, pages 214–228, Washington, DC, USA, 2006. IEEE Computer Society. ISBN 0-7695-2536-9. doi: <http://dx.doi.org/B689FD5D-A6F4-4B99-9500-6A3983EC26A6>.
- T. A. Wiggerts. Using clustering algorithms in legacy systems modularization. In *Proceedings of the Fourth Working Conference on Reverse Engineering (WCRE '97)*, page 33, Washington, DC, USA, 1997. IEEE Computer Society. ISBN 0-8186-8162-4.
- Wikipedia. Wikipedia, the free encyclopedia, 2010. URL en.wikipedia.org/wiki/Computer_software.

- Annie T. T. Ying, Raymond Ng, and Mark C. Chu-Carroll. Predicting source code changes by mining change history. *IEEE Trans. Softw. Eng.*, 30(9):574–586, 2004. ISSN 0098-5589. doi: <http://dx.doi.org/10.1109/TSE.2004.52>.
- E. Yourdon and L. Constantine. *Structured Design*. Yourdon Press, 1975.
- Thomas Zimmermann and Peter Weißgerber. Preprocessing CVS data for fine-grained analysis. In *Proceedings of the First International Workshop on Mining Software Repositories*, pages 2–6, May 2004.
- Thomas Zimmermann, Stephan Diehl, and Andreas Zeller. How history justifies system architecture (or not). In *Proceedings of the 6th International Workshop on Principles of Software Evolution (IWPSE '03)*, page 73, Washington, DC, USA, 2003. IEEE Computer Society. ISBN 0-7695-1903-2.
- Thomas Zimmermann, Peter Weißgerber, Stephan Diehl, and Andreas Zeller. Mining version histories to guide software changes. *IEEE Trans. Softw. Eng.*, 31(6):429–445, 2005. ISSN 0098-5589. doi: <http://doi.ieeecomputersociety.org/10.1109/TSE.2005.72>.

