

Building a Refactoring Tool for Erlang[★]

Zoltán Horváth, László Lövei, Tamás Kozsik, Róbert Kitlei,
Anikó Nagyné Víg, Tamás Nagy, Melinda Tóth, Roland Király
Eötvös Loránd University, Budapest, Hungary

Abstract

This paper presents RefactorErl, a refactoring tool for the Erlang programming language. Based on experience obtained during a major redesign of this tool, we describe some general principles that proved to be important for developing refactoring tools – not only for Erlang, but for other languages as well.

Key words: refactoring, Erlang, RefactorErl tool

References

- [1] Barklund, J., Virding, R., *Erlang Reference Manual*, 1999.
Available from http://www.erlang.org/download/erl_spec47.ps.gz.
- [2] Brett D., et al., *Automated Testing of Refactoring Engines*, In Proc. of the 6th joint meeting of the European software engineering conference, pages 185-194, Dubrovnik, Croatia, 2007.
- [3] Charles, P., Fuhrer, R.M., and Sutton, Jr., S., M., *IMP: a meta-tooling platform for creating language-specific IDEs in Eclipse*, In Proc. of the 22nd IEEE/ACM International Conference on Automated Software Engineering, pages 485-488, Atlanta, Georgia, USA, 2007.
- [4] Ducasse, S., Gîrba, T., and Nierstrasz, O., *Moose: an Agile Reengineering Environment* In Proceedings of ESEC/FSE 2005, September 2005, pages 99-102.
- [5] Eötvös Loránd University, *Refactoring Erlang Programs* (project homepage).
<http://plc.inf.elte.hu/erlang/>
- [6] Fowler, M., Beck, K., Brant, J., Opdyke, W., and Roberts, D., *Refactoring: Improving the Design of Existing Code*., Addison-Wesley, 1999.

[★] Supported by Ericsson Hungary and ELTE IKKK.

Email addresses: hz@inf.elte.hu (Zoltán Horváth), lovei@inf.elte.hu (László Lövei), kto@elte.hu (Tamás Kozsik), kitlei@elte.hu (Róbert Kitlei), viganiko@inf.elte.hu (Anikó Nagyné Víg), lestat@elte.hu (Tamás Nagy), melinda_toth@mad.hu (Melinda Tóth), kiralyroland@inf.elte.hu (Roland Király).

- [7] Fowler, M., *Refactoring Home Page*. <http://www.refactoring.com/>.
- [8] Garrido, A., *Program Refactoring in the Presence of Preprocessor Directives*. Tesis Doctoral. Univ. of Illinois at Urbana-Champaign Technical Report No. UIUCDCS-R-2005-2617.
- [9] Kozsik, T., Csörnyei, Z., Horváth, Z., Király, R., Kitlei, R., Lövei, L., Nagy, T., Tóth, M., Víg, A., *Use Cases for Refactoring Erlang Programs*. To appear in Central European Functional Programming School, Revised Selected Lectures, Springer LNCS series.
- [10] Li, H., Reinke, C., and Thompson, S. J., *Tool support for refactoring functional programs*. In Proceedings of the ACM SIGPLAN workshop on Haskell, Uppsala, Sweden, pages 27–38, 2003.
- [11] Li, H., Thompson, S.J., Lövei, L., Horváth, Z., Kozsik, T., Víg, A., and T. Nagy, T., *Refactoring Erlang Programs*. In Proceedings of the 12th International Erlang/OTP User Conference, November 2006.
- [12] Li, H., Thompson, S.J., *Testing Erlang Refactorings with QuickCheck*. In Proc. of the 19th International Symposium on Implementation and Application of Functional Languages, IFL2007, Freiburg, Germany, Septemer 2007.
- [13] Lövei, L., Horváth, Z., Kozsik, T., Király, R., Víg, A., and Nagy, T., *Refactoring in Erlang, a Dynamic Functional Language*, In Proceedings of the 1st Workshop on Refactoring Tools, pages 45-46, Berlin, Germany, July 2007.
- [14] Lövei, L., Horváth, Z., Kozsik, T., Király, R., *Introducing records by refactoring*. In Proceedings of the 2007 ACM SIGPLAN Erlang Workshop, pages 18-28. ACM Press, 2007.
- [15] Lövei, L., Horváth, Z., Kozsik, T., Király, R., and Kitlei, R., *Static rules of variable scoping in Erlang*, In Proceedings of the 7th International Conference on Applied Informatics, volume 2, pages 137-145. 2008.
- [16] Mitchell, B.S., *A heuristic search approach to solving the software clustering problem*, PhD thesis, Drexel University, Philadelphia, PA, USA, 2002.
- [17] Nyström, S., *A soft-typing system for Erlang*, Proceedings of the 2003 ACM SIGPLAN workshop on Erlang, pp. 56-71, Uppsala, Sweden, 2003.
- [18] Robbes, R., Lanza, M., *The "Extract Refactoring" Refactoring*, In Proceedings of WRT 2007 (1st International Workshop on Refactoring Tools), pp. 29 - 30, Berlin, Germany, 2007.
- [19] Roberts, D.: *Practical Analysis for Refactoring*, PhD thesis, University of Illinois at Urbana Champaign, 1999.
- [20] Roberts, D., Brant, J., and Johnson, R., *A Refactoring Tool for Smalltalk*, Theory and Practice of Object Systems. V3 N4, October 1997.
- [21] Szabó-Nacsá, R., Diviánszky, P., and Horváth, Z., *Prototype environment for refactoring Clean programs*, In The Fourth Conference of PhD Students in Computer Science (CSCS 2004), Szeged, Hungary, July 1–4, 2004. Full paper is available at http://aszt.inf.elte.hu/~fun_ver/ (10 pages).
- [22] Tichelaar, S., Ducasse, S., Demeyer, S., and Nierstrasz, O., *A Meta-model for Language-Independent Refactoring*, Proceedings of International Symposium on Principles of Software Evolution (ISPSE '00), IEEE Computer Society Press, 2000, pp. 157-167, Kanazawa, Japan, November 2000.
- [23] Vinju, J.J.: *Uptr: a simple parse tree representation format*, In Software Transformation Systems Workshop, October 2006.
- [24] Vinju, J.J., *Analysis and Transformation of Source Code by Parsing and Rewriting*, PhD thesis, November 2005.
- [25] Vittek, M., *Refactoring Browser with Preprocessor*. In Proceedings of the Seventh European Conference on Software Maintenance and Reengineering, page 101, 2003.
- [26] Wloka, J., Hirschfeld, R., and Hänsel, J., *Tool-supported Refactoring of Aspect-oriented Programs*, In Proceedings of the Conference on Aspect-oriented Software Development (AOSD), pages 132-143, Brussels, Belgium, March 31 - April 4, 2008.
- [27] World Wide Web Consortium: *XML Path Language (XPath) Version 1.0*. W3C Recommendation, Nov. 16, 1999, <http://www.w3.org/TR/xpath.html>
- [28] Waddington, D. G., Yao, B. *High Fidelity C++ Code Transformation*. In Boyland, J. and Hedin, G., editors, Proceedings of the 5th workshop on Language Descriptions, Tools and Applications (LDTA 2005), 2005.
- [29] Wiger, U., *XMERl – Interfacing XML and Erlang*, In the Sixth International Erlang/OTP User Conference (EUC 2000), Stockholm, Sweden, October 3, 2000.
<http://www.erlang.se/euc/00/xmerl.ppt>