# Metaprogramming with Macros

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***Abstract*—Macros realize the notion of textual abstraction. Textual abstraction consists of recognizing pieces of text that match a specification and replacing them according to a procedure.**

**In the focus of the study are syntactic abstractions in lexically scoped programming languages. We identify the problems of *hygiene* and *referential transparency* and describe the solutions employed in Template Haskell [1], Nemerle [2] and Racket [3].**

**We discuss integration of hygienic macros into statically typed languages and propose to improve upon state of the art by providing a type system for syntax templates and uncovering synergies with high-level language features such as path-dependent types and implicits [4].**

***Index Terms*—metaprogramming, macros, quasiquotes, hygiene, referential transparency**

## I. Introduction

THIS template is not trying to suggest a specific style for the content of your candidacy exam/thesis proposal paper; it only concerns the style of the writeup itself. This template is in LaTeX. We encourage you to use it for your write-up.

## References

[1] T. Sheard and S. Peyton Jones, Template meta-programming for Haskell. ACM SIGPLAN Notices, 2002.

[2] K. Skalski, M. Moskal and P. Olszta, Meta-programming in Nemerle. Third International Conference on Generative Programming and Component Engineering, 2004.

[3] E. Barzilay, R. Culpepper and M. Flatt, Keeping it Clean with Syntax Parameters. Scheme and Functional Programming Workshop, 2011.

[4] M. Odersky, L. Spoon and B. Venners, Programming in Scala 2nd Edition. Artima, 2010.

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