# Adjoint Code Compilers

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**Abstract:** This introductory talk on adjoint code compilers is meant to set the stage for the following presentations in the minisymposium on "Compilation of Adjoint Codes and Application for Optimization." We focus on the discussion of the basic principles underlying the forward and reverse modes of automatic differentiation (AD) [1, 2, 3, 4, 5] in the context of generating tangent-linear and adjoint codes automatically by source transformation. Moreover we point to ongoing research projects as well as challenges that developers of adjoint code compilers (and, thus, indirectly everybody who wants to use this technology) face.

The AD community's web portal can be accessed under `http://www.autodiff.org`. This site contains links to research groups and it maintains a list of currently available AD tools as well as a comprehensive bibliography.

**References:**

[1] A. Griewank, Evaluating Derivatives. Principles and Techniques of Algorithmic Differentiation, SIAM, **19**, 2000, Philadelphia, Frontiers in Applied Mathematics.

[2] Automatic Differentiation: Theory, Implementation, and Application, Editors: G. Corliss and A. Griewank, Proceedings Series, SIAM, 1991, Philadelphia

[3] Computational Differentiation: Techniques, Applications, and Tools, Editors: M. Berz and C. Bischof and G. Corliss and A. Griewank, Proceedings Series, SIAM, 1996, Philadelphia

[4] Automatic Differentiation of Algorithms – From Simulation to Optimization, Editors: G. Corliss, C. Faure, A. Griewank, L. Hascoet and U. Naumann, Springer, 2002, New York

[5] Automatic Differentiation: Applications, Theory, and Tools, Editors: M. Bücker, G. Corliss, P. Hovland, U. Naumann and B. Norris, Vol. 50, 2005, Lecture Notes in Computational Science and Engineering, Springer.

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