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**ADAM KOLKIEWICZ**, Department of Statistics and Actuarial Science, University of Waterloo  
*Optimal Static Hedging of Path-Dependent Options*

We present a novel method of hedging path-dependent options in a discrete time setup. Assuming that prices are given by the Black–Scholes model, we first describe the residual risk when hedging a path-dependent option using only a European option. Then we find the hedging option that minimizes the shortfall risk, which we define as the expectation of the shortfall weighted by some loss function. The payoff function of this option is obtained as a solution of a non-parametric optimization problem. We first illustrate the method using Asian options. Then we discuss a generalization of the method that can be used to characterize optimal ways of risk mitigation for non-traded assets and liabilities.