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Spot: A linear-operator toolbox for Matlab

Linear operators are at the core of many of the most basic algorithms for signal and image processing. Matlab's high-level, matrix-based language allows us to express naturally many of the underlying matrix operations—e.g., computation of matrix-vector products and manipulation of matrices—and is thus a powerful platform on which to develop concrete implementations of these algorithms. Many of the most useful operators, however, do not lend themselves to the explicit matrix representations that Matlab provides. This talk describes the new Spot Toolbox, which aims to bring the expressiveness of Matlab's built-in matrix notation to problems for which explicit matrices are not practical. I will demonstrate features of the toolbox with examples from compressed sensing and image reconstruction.

This is joint work with Ewout van den Berg.