1154-68-1176 **Cristina Garcia-Cardona*** (cgarciac@lanl.gov). *Learning Convolutional Sparse Representations.*

Convolutional sparse representation (CSR) is a successful technique that has been applied to a broad range of problems in signal and image processing, computer vision and machine learning. In a convolutional sparse representation, sums of a set of convolutions with dictionary filters (basis elements) are used to construct the model. The optimization is computed over the entire signal domain, yielding representations that are very sparse both spatially and across the filter indices. However, estimating the CSR for a specific data set usually requires the solution of a computationally expensive optimization problem. Recently, some of these optimization problems have been de-constructed and unrolled into a feed-forward network structure with the aim of reducing processing times. We present some applications of this unrolling concept, and discuss how this framework is more amenable to theoretical analysis and helps to bridge the gap of interpretability of more common convolutional neural networks. (Received September 13, 2019)