

# Low Rank Plus Sparse (L+S) Matrix Reconstruction for Accelerated Dynamic MRI

**Ricardo Otazo**

Department of Radiology  
New York University School of Medicine  
New York, NY, United States  
[ricardo.otazo@nyumc.org](mailto:ricardo.otazo@nyumc.org)

Extensive spatiotemporal correlations in dynamic MRI enable the application of compressed sensing and low-matrix completion to accelerate data acquisition. The combination of both approaches is very attractive to increase imaging speed. Low-rank plus sparse (L+S) matrix decomposition or robust principal component analysis (RPCA) can be employed to represent dynamic images as a superposition of a background component (L) and a dynamic component (S). The dynamic component can include for example organ motion or contrast-enhancement information. The L+S model increases the compressibility of dynamic images and performs automatic background suppression in the S component. This talk will describe how the L+S model can be employed to reconstruct undersampled dynamic MRI data with automatic separation of background and dynamic components. An extension of the L+S approach that incorporates a motion model to improve the performance in the presence of organ motion will be also discussed. Reconstruction of highly-accelerated dynamic MRI data corresponding to cardiac perfusion, cardiac cine, time-resolved peripheral angiography, and abdominal perfusion using Cartesian and golden-angle radial sampling will be presented to show feasibility and general applicability of the L+S method.