

# Dynamic SPECT reconstruction from few projections by spatialtemporal sparsity constrained matrix factorization

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Dynamic Single-Photon Emission Computed Tomography (SPECT) allows 3D visualization and monitoring of biological processes in human body. Due to fast decay of radioisotope by time, very few projection data can be collected at each time interval. Thus the reconstruction of dynamic images is a very challenge problem, especially when noise is present. In this work, we consider low rank matrix factorization of unknown images and explore spatial-temporal sparsity structures of both representation coefficients and basis. The proposed variational model can be efficiently solved by well-known sparse optimization algorithms. Numerical experiments and comparison with other methods on 2D and 3D data show the advantages of our proposed method for the reconstruction and regularization from very few projection data with noise.