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## Modeling and Reconstruction of Mixed Functional and Molecular Patterns

Yue Wang,<sup>1</sup> Jianhua Xuan,<sup>2</sup> Rujirutana Srikanchana,<sup>3</sup> and Peter L. Choyke<sup>4</sup>

<sup>1</sup>Department of Electrical and Computer Engineering, Computational Bioinformatics and Bioimaging Laboratory, Virginia Polytechnic Institute and State University, 4300 Wilson Boulevard, Suite 750, Arlington 22203, VA, USA

<sup>2</sup>Department of Electrical Engineering and Computer Science, The Catholic University of America, Washington 20064, DC, USA

<sup>3</sup>Riverain Medical, Riverain Research Group, Rockville 20850, MD, USA

<sup>4</sup>Molecular Imaging Program, National Cancer Institute, National Institutes of Health, Bethesda 20892, MD, USA

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### Abstract

Functional medical imaging promises powerful tools for the visualization and elucidation of important disease-causing biological processes in living tissue. Recent research aims to dissect the distribution or expression of multiple biomarkers associated with disease progression or response, where the signals often represent a composite of more than one distinct source independent of spatial resolution. Formulating the task as a blind source separation or composite signal factorization problem, we report here a statistically principled method for modeling and reconstruction of mixed functional or molecular patterns. The computational algorithm is based on a latent variable model whose parameters are estimated using clustered component analysis. We demonstrate the principle and performance of the approaches on the breast cancer data sets acquired by dynamic contrast-enhanced magnetic resonance imaging.

Abstract

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