

# Fisher Vectors for PolSAR Image Classification

Javier Redolfi<sup>1,2,3</sup>, Jorge Sánchez<sup>1</sup>, and Ana Georgina Flesia<sup>1</sup>

<sup>1</sup> Centro de Investigación en Informática para la Ingeniería, Universidad Tecnológica Nacional, Facultad Regional Córdoba, Maestro López S/N, Córdoba, Argentina,

<sup>2</sup> Departamento de Ingeniería Electrónica, Universidad Tecnológica Nacional, Facultad Regional San Francisco, Av. de la Universidad 501, San Francisco, Argentina,

<sup>3</sup> CONICET, Haya de la Torre S/N, Córdoba, Argentina  
jredolfi@frc.utn.edu.ar

**Resumen** In this letter we study the application of the Fisher Vector (FV) to the problem of pixel-wise supervised classification of PolSAR images. This is a challenging problem since information in those images is encoded as complex-valued covariance matrices. We observe that the real part of these matrices preserve the positive semidefiniteness property of their complex counterpart. Based on this observation, we derive a FV from a mixture of real Wishart pdfs and integrate it with a Potts-like energy model in order to capture spatial dependencies between neighboring regions. Experimental results on two challenging datasets show the effectiveness of the approach.

**Keywords:** PolSAR, Fisher Vectors, Image Classification

Originalmente publicado en Redolfi, Javier; Sánchez, Jorge; Flesia, Ana Georgina. Fisher Vectors for PolSAR Image Classification. IEEE Geoscience and Remote Sensing Letters, 2017, vol. 14, n° 11, p. 2057-2061. DOI 10.1109/LGRS.2017.2750800