

## Riesz Mixture Model for Brain Tumor Detection

**Authors :** Mouna Zitouni and Mariem Tounsi

**Abstract :** This research introduces an application of the Riesz mixture model for medical image segmentation for accurate diagnosis and treatment of brain tumors. We propose a pixel classification technique based on the Riesz distribution, derived from an extended Bartlett decomposition. To our knowledge, this is the first study addressing this approach. The Expectation-Maximization algorithm is implemented for parameter estimation. A comparative analysis, using both synthetic and real brain images, demonstrates the superiority of the Riesz model over a recent method based on the Wishart distribution.

**Keywords :** EM algorithm, segmentation, Riesz probability distribution, Wishart probability distribution

**Conference Title :** ICMMAC 2025 : International Conference on Mathematical Modeling, Analysis and Computation

**Conference Location :** Jeddah, Saudi Arabia

**Conference Dates :** February 17-18, 2025