

# Accelerating a RBF-based method for 3D surface reconstruction through Julia programming

Pasquale De Luca, Ardelio Galletti and Livia Marcellino

## **Abstract**

The 3D surface reconstruction is critical for various applications, demanding efficient computational approaches. Traditional Radial Basis Functions (RBFs) methods are limited by increasing data points, leading to slower execution times. Addressing this, our study introduces a experimental parallelization effort using Julia, renowned for high-performance scientific computing. We developed an initial sequential RBF algorithm in Julia, then expanded it to a parallel model, exploiting Multi-Threading to enhance execution speed while maintaining accuracy. This initial exploration into Julia's parallel computing capabilities shows marked performance gains in 3D surface reconstruction, offering promising directions for future research. Our findings affirm Julia's potential in computationally intensive tasks, with test results confirming the expected time efficiency improvements.