

MATHEMATICAL SCIENCES

AMMIN/DISMA - Bayesian Models for Size-And-Shape data

Funded By	POLITECNICO DI TORINO - AMMINISTRAZIONE CENTRALE [Piva/CF:00518460019] Dipartimento DISMA
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Context of the research activity	Size-and-Shape data describe the geometric characteristics of an object after eliminating information about its location and rotation. Typically represented by a set of coordinates defining the object, these data are essential for decision-making in various fields, such as biology, medicine, and forensics. Applications include handwriting and expression recognition, the analysis of cancerous cell shapes, and the study of coral reef structures.
Objectives	This research aims to develop Bayesian models tailored to the analysis of Size-And-Shape data, capturing their variability and structural complexity while addressing traditional simplistic assumptions and identifiability issues. It also focuses on implementing efficient computational methods for Bayesian inference and developing software solutions for the analysis of complex geometric data.
Skills and competencies for the development of the activity	The student must have a strong knowledge of Bayesian statistics and MCMC algorithms. He/she should be proficient in a high-level programming language for scientific computing, such as Julia or C++. Alternatively, experience with software like R or Python is also acceptable.