

Computing the Stratification of Actions of Compact Lie Groups

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Abstract

We provide a constructive approach to the stratification of the representation- and the orbit space of linear actions of compact Lie groups contained in $GL_n(\mathbf{R})$ on \mathbf{R}^n and we show that any d -dimensional stratum, respectively, its closure can be described by d sharp, respectively, relaxed polynomial inequalities and that d is also a lower bound for both cases. Strata of the representation space are described as differences of closed sets given by polynomial equations while d -dimensional strata of the orbit space are represented by means of polynomial equations and inequalities. All algorithms have been implemented in SINGULAR V2.0.