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Symbolic Analysis of Lie's Theorem

A fundamental theorem in Lie theory is the classical result (due to Lie himself) which asserts that for each finite dimensional, real Lie algebra **g** there exists a (local) Lie group G whose associated Lie algebra is the given algebra **g**. In this talk I will discuss the symbolic implementation of this theorem.

Surprisingly, the standard proof of this theorem (due to Cartan) does not translate into a very useful symbolic algorithm. I will explain why and then give another proof of Lie's theorem which is computationally effective. Applications to invariant theory will be presented.