Introduction to Lie Groups

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History of Lie Groups

Back in nineteenth century, the mathematician Sophus Lie was inspired by Galois' development of group theory and its application on analyzing polynomials. Which, he intended to develop symmetries in PDEs and geometry, specifically using group actions. With further development on manifolds, Lie's groundwork had become the current form of lie groups, a tool used to study specific structures of manifolds.

Preliminaries - Smooth Manifold

A manifold M with dimension n, is a topological space that is locally like $\mathbb{R}^n$. More precisely, for any point $m \in M$, there exists an open neighborhood $U \subseteq M$ along with a homeomorphism $\phi : U \to \mathbb{R}^n$ (i.e. ϕ is a continuous bijective map, with its inverse ϕ^{-1} also being continuous).

Preliminaries - Group

An Example in Python

Primality and Factorization

The Foundations of Modern Cryptography: Elliptic Curves

Reference and Acknowledgements

Reference Material: "Introduction to Smooth Manifold" by John M. Lee

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