

Universally Composable Computation Without Honest Majority

Brynjulf Owren
Center for Advanced Study
Drammensveien 78
N-0271 Oslo
NORWAY

Abstract

Most Lie group integrators can be expanded in series indexed by the set of ordered rooted trees. To each tree one can associate two distinct higher order derivation operators, which we call frozen and unfrozen operators. Composition of frozen operators induces a concatenation product on the trees, whereas composition of unfrozen operators induces a somewhat more complicated product known as the Grossman-Larson product. Both of these algebra structures can be supplemented by the same coalgebra structure and an antipode, the result being two distinct cocommutative graded Hopf algebras. We discuss the use of these structures and their duals, both for deriving order conditions for Lie group integrators and for deriving the modified vector field for these integrators.