Nonlinear Partial Differential Equations
Boundary value problems and equations arising in fluid mechanics

Non-holonomic geodesic equations on the group of diffeomorphisms of the unit circle

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Geodesics on the space of normalised univalent functions defined on the unit disc can be lifted to geodesics on the group of orientation preserving diffeomorphisms of the unit circle, under the condition of respecting some non-holonomic constraints. Thus, we aim to find non-holonomic geodesic equations on the infinite dimensional Lie groups having in mind the model example of the Virasoro-Bott group and the group of sense preserving diffeomorphisms of the unit circle. The non-holonomic geodesic equations is a generalisation of inviscid Burgers', Camassa-Holm, Hunter-Saxton, KdV equations, and other known non-linear PDE related to the fluid mechanics.