Contribution ID: **197** Type: **poster**

Precise Solutions to Non-Linear Partial Differential Equations of Einstein Tensor and Ricci Flow with its geometrical applications to Neural Networks and Neural Computing

Tuesday, 24 September 2024 21:10 (1 minute)

We present an exact solution of General Theory of Relativity, wherein rotational tensor and strain-deformation tensor are found embedded in Einstein curvature tensor. It turns out that these tensors encapsulate Dirac matrices, as concealed modules within Christoffel symbols of second kind. Additionally, the partial differentiation of these Christoffel symbols discovers three major underlying components of Ricci curvature tensor: (a) Dirac equations employing Gamma matrices as their wave functions; (b) d'Alembert operators for elucidating quantum gravitational waves; and (c) Hessian matrix or Laplacian operators for evaluating concavity and its geometric applications to neural networks and neural computing. Integration of these components to geometric analysis of Ricci flow leads to a unified formulation of all the three geometrical flows (spherical scalar curvature, "R>0", flat - zero scalar curvature, "R=0", and hyperbolic scalar curvature, "R<0"), offering exact solutions to mathematical physics problems such as: (i) Singularity and dark energy; (ii) Ricci flow; (iii) Einstein field equations - Ricci curvature scalar; (iv) Completeness of geodesic equations; (v) Coordinate transformation of quantum fields as tensor fields; (vi) Resolution of the flatness problem involving accelerating-expanding universe; and (vii) Reformulation of Christoffel symbols of first and second kinds, under the principles of Ricci theorem. Thus, this paper concludes the complete theoretical framework of Quantum Gravitation and its cutting-edge application to the optimisation of reinforcement learning for Artificial Neural Machines.

Primary author: Mr SINHA, Aayush (Indian Youth Nuclear Society, India)

Presenter: Mr SINHA, Aayush (Indian Youth Nuclear Society, India)

Session Classification: Poster Session