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6. Topology

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Functional Integrals and the Kontsevich Integral

By using the (Witten) functional integral for gauge connections with Chern-Simons Lagrangian we show how the Vassiliev invariants for knots and links and their weight systems arise naturally in this context. In particular, we show how a new version of the Kontsevich integral arises via the axial gauge of Frolich and King. This yields a natural line of development from the Witten integral to the Kontsevich integral.