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**Seung Yeop Yang\*** (syyang@gwu.edu). *On rack and quandle spaces and homotopy invariants of links.*

In 1993, Fenn, Rourke, and Sanderson introduced rack spaces and rack homotopy invariants, and modifications to quandle spaces and quandle homotopy invariants were introduced by Nosaka in 2011. We define the Cayley-type graph and the extended quandle space of a quandle in analogy to rack and quandle spaces. Moreover, we construct the shadow homotopy invariant of a classical link and prove that the shadow homotopy invariant is equal to the quandle homotopy invariant multiplied by the order of a quandle. (Received September 09, 2016)