Koutsopoulos et al. introduce a set of local graph transformation rules (called \emph{primitives}) which are studied i.a. in the context of overlay networks. If these primitives are used to manipulate the edges of the network, weak connectivity is preserved, a feature that is very important for protocols in overlay networks.

In the previous literature, the primitives were considered in the context of distributed protocols. In SDN overlay networks, the restructuring of the network is centralized, while the decentralized components only take on simple tasks. One advantage of using the the primitives if we have a ``global'' view of the network is that primitive applications are local operations, that is, the decentralized components can each check whether their centrally-calculated changes to the network are permissible and execute them locally. As a consequence, the weak connectivity is maintained, even if the central instance were compromised.

This motivates interest in designing algorithms that use these primitives for graph transformation and have a global view of the network. Since primitive applications are associated with network communication, we want to minimize the number of primitive applications.

We will present two of our main results: We prove that the aforementioned graph transformation problem is $\NP$-complete and give a polynomial-time constant-factor approximation algorithm.