

In hybrid networks, nodes can make use of different communication modes, which may have different characteristics and limitations in terms of their bandwidth or complexity. For example, mobile communication can be either via high-bandwidth WLAN when the devices are close or via low-bandwidth cellular infrastructure. To study such networks, we use the HYBRID model defined by Augustine et al. [SIAM'20], which allows a local and global communication mode. In the local mode, the nodes are restricted to their local neighborhood, while in the global mode, nodes can communicate with arbitrary nodes in the network.

Using the HYBRID model for subclasses of unit-ball graphs (UBGs) with n nodes, we compute local routing schemes that induce constant stretch paths in the local network and only require $O(\log n)$ bits for labels and local routing information. For hole-free UBGs contained in slabs of thickness $[0, 1/2]$, we prove that such a routing scheme can be computed in $O(\log n)$ rounds assuming that the slab normal is known by each node. For UBGs that form an arbitrary sized right prism, we show that $O(\log^{3/2} n)$ rounds suffice.

In the computations, we are able to transfer the routing scheme for hole-free two-dimensional unit-disk graphs (UDGs) by Coy et al. [OPODIS'21] to the three-dimensional setting.