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David W Stoner* (dstoner@college.harvard.edu), 422 Leverett Mailing Center, 28 DeWolfe Street, Cambridge, MA 02138, and **Mehtaab Sawhney**. *Hypercube Packings and Coverings with Higher Dimensional Rooks*.

We introduce a generalization of classical q -ary codes by allowing points to cover other points that are Hamming distance 1 or 2 in a freely chosen subset of all directions. More specifically, we generalize the notion of 1-covering, 1-packing, and 2-packing in the case of q -ary codes. In the covering case, we establish the analog of the sphere-packing bound and in the packing case, we establish an analog of the singleton bound. Given these analogs, in the covering case we establish that the sphere-packing bound is asymptotically never tight except in trivial cases. This is in essence an analog of a seminal result of Rodemich regarding q -ary codes. We establish for the 1-packing and 2-packing cases that the analog of the singleton bound is tight in several possible cases and conjecture that these bounds are optimal in general. (Received February 06, 2018)