

Latin hypercube designs (LHDs) have found wide application in computer experiments. It is known that orthogonal LHDs guarantee the orthogonality between all linear effects, and symmetric LHDs ensure the orthogonality between linear and second-order effects. In this paper, we propose a construction method for orthogonal symmetric LHDs. Most resulting LHDs can accommodate the maximum number of factors, thus can study many more factors than existing ones. Moreover, several methods for constructing nearly orthogonal symmetric LHDs are also provided. All the constructed orthogonal and nearly orthogonal LHDs could be utilized to generate more nearly orthogonal symmetric LHDs. A detailed comparison with existing designs shows that the resulting designs have more flexible and economical run sizes and have many desirable design properties.