Application of optimization techniques to reliability and redundancy allocation

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Abstract. In system design, reliability is a crucial factor, since it has a heavy impact on the operating cost. However, over-reliable system requires a prohibitive investment. In this talk, we examine the problem of determining the number of parallel components of same functionality to be used in the system and their reliabilities, to optimize a given objective function under some technical or financial constraints. Such a problem will be studied under various settings and various system architectures. We will prove some properties. Based on these properties, some optimization problems are drastically simplified and optimization algorithms will be presented.