

ADAPTIVE DESIGNS FOR OPTIMAL AGE REPLACEMENT POLICY

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Abstract

Consider a system that is subject to failure and must be replaced when this occurs. If it costs less to replace the system in advance before failure, it may be advantageous to use an age replacement policy. However, the optimal age to replace the system is unknown if the underlying model for machine failure is unknown. This paper reviews various schemes that balance the conflicting goals of gathering enough information about the lifetime distribution, and simultaneously controlling costs by reducing system failures.

1. Introduction. In general, optimal replacement policies are designed to reduce the number of system failures and minimize maintenance costs by adopting a schedule of planned replacements. A great deal of literature [see Thomas (1986) and Valdez-Florez and Feldman (1989) for review articles] is devoted to the study of optimal replacement policies. By far the greater part of this literature is concerned with finding the optimal policy when the underlying model for system failure is known. Much less work has been done to actually estimate these optimal policies based on maintenance history data. Most estimation procedures that have been developed are based on observing a

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