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Designing Resilient Graphs

Intrusions occur at a set S of f vertices in a connected simple graph G. Each of d defenders protects one node that is not yet corrupted. The "infection" then spreads to a set of neighbouring unprotected nodes. The intruders and defenders take turns until some stopping condition is true.

For a fixed positive integer n, we consider the problem of constructing a graph G that is optimal in the following sense: the expected damage resulting from a random attack by a set of f intruders on G is minimum for graphs of order n.