

The Recover Problem. [\[COMMENT\]](#) Consider other name.

David Ponnarovsky

January 13, 2023

Abstract

We answer what is the complexity of recovering a system after absorbing a significant damage. Formally we show that if it is guaranteed that an amicus/virus program took the control on at most $\Theta(n)$ ([\[COMMENT\]](#) $\frac{1}{4}n$) parties then one can either recover the system at a cost linear in the damage made by the malicious.

1 Introduction.

Consider the case that an organization detects a malicious program in its net, knowing that the virus touched at most a quarter of the computers. It needs to take a decision whether it is going to reformat the whole system or paying the cost of recovering the damage. Even the problem might sound artificial, it actually models situations in which the damage that is made for the companies is not well understood. In this work we suggest a simple solution for that problem and also review how efficiently one can use other constructions from the error correction codes field.

Formally we consider n computers that store a state of dimension k . The design of the network is fixed at initialization time such that any computer is restricted to communicate with at most Δ other components. At time t a malicious is detected and we have to. system