

Abstract

Fault detection and Isolation takes a strategic position in modern industrial processes for which various approaches are proposed. These approaches are usually developed and based on a consistency test between an observed state of the process provided by sensors and an expected behaviour provided by a mathematical model of the system. These methods require a reliable model of the system to be monitored which is a complex task. Alternatively, we propose in this paper to use blind source separation filters (BSSFs) in order to detect and isolate faults in a three tank pilot plant. This technique is very beneficial as it uses blind identification without an explicit mathematical model of the system. The independent component analysis (ICA), relying on the assumption of the statistical independence of the extracted sources, is used as a tool for each BSSF to extract signals of the process under consideration. The experimental results show the effectiveness and robustness of this approach in detecting and isolating faults that are on sensors in the system