# On the observers design, old and new results

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## Abstract

*There is always a need to know the states of a system in order to make important decisions, control the system, or predict reliably its future state. A simple but sure method for knowing the states of a system is to measure them directly. However, in a general complex system, it is not feasible or even possible to directly measure all the states of the system. An alternative method for knowing the states of the system instead of measuring them all is to create and use a model for the system. If the model is perfect, we can accurately estimate the states when the inputs and the initial conditions of the system are known exactly. However, the initial conditions are never known and some inputs are unknown (external disturbances for example). Then, the efficient method to estimate the state of a system is the observer (called also a software sensor). It concerns the reconstruction of the state of a system based on the available measurements and the model of the system, generally uncertain. The objective of this talk is to give an overview of the past and recent developments in the field of the observers design. It also presents some open theoretical and practical problems.*

## 1. Introduction

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