



SDI FINAL EVALUATION FORM 1.1

PART 1:

Journal Name:	British Journal of Mathematics & Computer Science
Manuscript Number:	2014_BJMCS_14872
Title of the Manuscript:	Feedback controls for finite time or asymptotic compensation in lumped disturbed systems

PART 2:

FINAL EVALUATOR'S comments on revised paper (if any)	Authors' response to final evaluator's comments
1. In revised manuscript equation (1.1) is not matching with original and output will not be produced as input is not applied. 2. Equation (1.1) is not describing the clarity for disturbance whether it with system or input. 3. Equation (1.3) revealing the disturbance, once system does not have any input as stated in the system dynamics and output will not be available due to absence of input but author is showing the output which is wrong. 4. Simulation work required to conformity of asymptotic compensation which is absence here. Therefore further revision is not recommended. 5. Manuscript is lacking with author contribution. 6. Author is motivated for carrying out the conformity of algorithm with contribution.	❖ The purpose of this work, is essentially to study the possibility to compensate (in a finite time horizon or asymptotically) the effect of any (or a class of) disturbance(s) f on a the considered system, using feedback controls $u=Kf$. In the previous version, we presented progressively in the introduction (equations (1.1), ... (1.4)), the notion of remediability (compensation) in the open loop case, as considered in previous works. Indeed, we considered - Firstly the normal case (equation (1.1)) where the system is autonomous (without disturbance neither control). - Then in that where it is excited by a disturbance f which may be known or unknown. This may be detected from the fact that the observation is not normal. Hence, the problem is how to act (control) in order to bring the observation to its initial (normal) state. - For this purpose, a control term was introduced (equation (1.4)). However, in order to avoid any confusion, we consider directly in this version, a general system (1.1), and then we recall briefly the problem of remediability in the open loop case. Consequently, the problems mentioned in remarks 1, 2 and 3 are not posed in this version. ❖ On another hand, concerning our contribution, the notion of K-remediability is motivated, well defined and characterized. Various situations are examined and the main properties of this notion are given (in the finite time and asymptotic cases). The relationship with the classical remediability (in open loop case) is also studied. The different developments and results presented in this paper on the problem of compensation (remediability), using directly feedback controls $u=Kf$ (depending linearly on the disturbance f) are original, mathematically proved and scientifically conform. Illustrative examples are given. They are also practical and may be applied to specific situations. Indeed, for any K-remediable disturbance f, the feedback control $u=Kf$ ensures the compensation of the effect of the disturbance f on the system. Even if f is not known, the corresponding observation y_f is known (in the linear case) and the feedback control $\bar{u} = \bar{K} y_f$ brings the observation to its normal state at the finite time (respectively asymptotically). As an illustrative example, we examine the case of a two dimension system in the asymptotic case. The results are similar in the finite time case.