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Journal Name:	British Journal of Mathematics & Computer Science
Manuscript Number:	2014_BJMCS_14446
Title of the Manuscript:	LQ Optimal Control-Based Variable Gain Controllers for Linear Systems with Structured Uncertainties and Its Performance Analysis
Type of the Article	Original Research Article

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PART 1: Review Comments

	Reviewer's comment by selecting ment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	1. In equation (4.1) the parameter δ should be given 2. the first term of equation (4.2) should be corrected as follows, $\left\ \frac{1}{R} B^T P x(t) \right\ ^2$ 3. In remark 2, the authors said that by selecting δ, the proposed controller can achieve good transient performances. The authors are asked to prove this. In fact, if we choose δ such that $x^T P B R^{-1} B^T P x \geq \delta x^T x$, then $\gamma(t)$ is equal to the first term of equation (4.2) and consequently independent of δ. This implies also that $u(t)$ is independent of δ. Thus, the statement is not correct both for achieving good transient response and for adjusting the magnitude of the control input. 4. the matrix K in (5.2) is not correct and should be corrected. It follows that the simulations results should be revised and corrected. 5. in the simulation results, the case 1 (time invariant uncertainty) leads to good transient response compared with case 2 (time varying uncertainty). A remark might be needed to address this issue and evaluating its validity. 6. from table 1 and table 2, it can be seen that case 2 leads	1. In (4.1), the design parameter δ has been shown in (1,1)-block of the matrix inequality. 2. As you mentioned, there are some mistake. (4.2) has been modified. 3. The reviewer is misunderstanding. The relation $x^T(t) P B \{ \text{cal } R \}^{-1} B^T P x(t) \geq \delta x^T(t) x(t)$ does not satisfied in fully state space, because $\{\text{rank}\} \left\{ B \{ \text{cal } R \}^{-1} B^T \right\} \leq \{\text{rank}\} \left\{ I_n \right\}$. Besides, since the parameter δ is selected by designers and the trajectory of the system is determined by the control input and the initial value, $u(t)$ is not independent of δ. This fact has shown in the simulation results in this paper. 4. Thank you for your comments. There is a mistake in the system parameter. In numerical simulations, the system parameter has been corrected. 5. You can find that in σ_2^*, Case 1) does not lead to good transient performance. It is well known that the transient performance depends on the uncertainties. Thus we think that the on-line adjustment of the design parameter is useful. However, the on-line adjustment of



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	to lower value of the performance index. This contradicts the performance of the transient response. A remark might be needed to show how to overcome this problem.	the design parameter δ is one of our future research subjects. 6. In this paper, we consider the control performance when we compare the desired trajectory generated by the nominal system with the time response of the uncertain system. Namely, lower value of the performance index does not mean good transient performance. In this simulation, the controller σ_2^* in Case 2) achieves good performance comparing with the other cases.
<u>Minor</u> REVISION comments	1. There is a missing $x(t)$ in equation (3.6) 2. There are some typos to be corrected. For example in page 101, "the transpose of matrix A and the inverse of one" should be "the transpose and the inverse of matrix A"; "represents a its induced" should be "represents its induced" 3. There is a missing $x(t)$ in equation (5.1) 4. line 1 after (5.3), (4.9) should be (4.1)	1. As you mentioned, there are some mistake. (3.6) has been modified. 2. Following the reviewer's comments, some typos are corrected. 3. (5.1) has been modified. 4. In pp.7, line 1 after (5.3), (4.9) has been corrected as (4.1).
<u>Optional/General</u> comments		We authors greatly appreciate your helpful comments to our paper (ID : 2014/BJMCS/14446), which help us improve the correctness and readability of our paper. On the basis of the referee's comments we add and modify some points to make our main contribution and vague points clearer.