## **Accepted Manuscript**

 $\mathcal{L}_2 - \mathcal{L}_\infty$  Filtering for Stochastic Time-varying Delay Systems Based on the Bessel-Legendre Stochastic Inequality

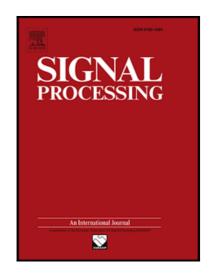
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#### ACCEPTED MANUSCRIPT

#### HIGHLIGHTS

- ullet This paper deals with the  $L_2$ – $L_\infty$  filtering problem for stochastic systems with time-varying delay.
- We develop a new stochastic integral inequality called Bessel-Legendre stochastic inequality.
- A new Lyapunov-Krasovskii functional is proposed to design a less conservative  $L_2$ - $L_\infty$  filter for stochastic time-varying delay systems.
- An  $L_2$ - $L_\infty$  performance condition is presented, and then an  $L_2$ - $L_\infty$  filtering approach is developed accordingly.

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