

## Accepted Manuscript

Stabilization of some composite stochastic control systems with nontrivial solutions

Fakhreddin Abedi, Wah June Leong

PII: S0947-3580(17)30259-5  
DOI: [10.1016/j.ejcon.2017.07.001](https://doi.org/10.1016/j.ejcon.2017.07.001)  
Reference: EJCON 218

To appear in: *European Journal of Control*

Received date: 21 August 2015  
Revised date: 7 July 2017  
Accepted date: 14 July 2017

Please cite this article as: Fakhreddin Abedi, Wah June Leong, Stabilization of some composite stochastic control systems with nontrivial solutions, *European Journal of Control* (2017), doi: [10.1016/j.ejcon.2017.07.001](https://doi.org/10.1016/j.ejcon.2017.07.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Stabilization of some composite stochastic control systems with nontrivial solutions

Fakhreddin Abedi<sup>1,2\*</sup> and Wah June Leong<sup>2</sup>

<sup>1</sup>*Center for University of London International Programmes (UOLIP), HELP Education Group, College of Arts and Technology, Kuala Lumpur, Malaysia*

<sup>1,2</sup>*Department of Mathematics and Institute for Mathematical Research, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia*

## Abstract

This paper deals with the global stability for some composite stochastic control systems with nontrivial solutions by means of dynamic feedback laws. In particular, we establish feedback law for global asymptotic stabilization of a control subsystem deduced from the composite stochastic system and apply the result to stabilize the original composite stochastic system. Under this framework, firstly we derive necessary and sufficient conditions for the existence of feedback law which renders a ball that contains all nontrivial equilibrium solutions of the stochastic control subsystem globally asymptotically stable in probability. Secondly, for the composite system, we give the sufficient conditions for practical global asymptotic stability of the composite system based upon the feedback law derived for the subsystem. Numerical examples are given to validate our results.

*Keywords:* stochastic control system; composite system; control Lyapunov function; practical global asymptotic stability in probability; nontrivial solutions.

*AMS Subject Classifications:* 60H10; 93C10; 93D05; 93D15; 93D21; 93E15.

---

\*Corresponding author.

*E-mail addresses:* f\_abedi1352@yahoo.com.(F. Abedi)

Download English Version:

<https://daneshyari.com/en/article/7113752>

Download Persian Version:

<https://daneshyari.com/article/7113752>

[Daneshyari.com](https://daneshyari.com)