

## Accepted Manuscript

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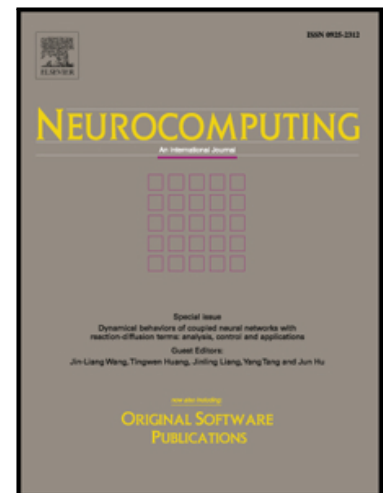
PII: S0925-2312(17)30510-6  
DOI: [10.1016/j.neucom.2017.03.015](https://doi.org/10.1016/j.neucom.2017.03.015)  
Reference: NEUCOM 18236

To appear in: *Neurocomputing*

Received date: 10 January 2017  
Revised date: 7 February 2017  
Accepted date: 8 March 2017

Please cite this article as: Qiankun Song, Hanqi Shu, Zhenjiang Zhao, Yurong Liu, Fuad E. Alsaadi, Lagrange stability analysis for complex-valued neural networks with leakage delay and mixed time-varying delays, *Neurocomputing* (2017), doi: [10.1016/j.neucom.2017.03.015](https://doi.org/10.1016/j.neucom.2017.03.015)

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# Lagrange stability analysis for complex-valued neural networks with leakage delay and mixed time-varying delays

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**Abstract:** This paper discusses the stability in Lagrange sense for complex-valued neural networks with time-varying discrete delays and distributed delays as well as leakage delay. By constructing an appropriate Lyapunov-Krasovskii functional, and employing free-weighting-matrix approach and inequality techniques in matrix form, a sufficient criterion to guarantee global exponential stability in Lagrange sense is obtained for the investigated neural networks. The given criterion is delay-dependent and is shown as linear matrix inequalities in complex domain, which can be calculated numerically applying valid YALMIP toolbox in MATLAB. A numerical example is provided to manifest the validity of the proposed result.

**Keywords:** Complex-valued neural networks; Lagrange stability; time-varying discrete delays; time-varying distributed delays; leakage delay; linear matrix inequality in complex domain

## 1. Introduction

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