

EXPONENTIAL STABILITY OF PERIODIC SOLUTIONS OF  
RECURRENT NEURAL NETWORKS WITH FUNCTIONAL  
DEPENDENCE ON PIECEWISE CONSTANT ARGUMENT

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## Abstract

Akhmet [1] generalized differential equations with piecewise constant argument by taking any piecewise constant functions as arguments, and recently he introduced functional dependence on piecewise constant argument [2]. These equations play an important role in applications such as neural networks [3]. In this study, we develop a model of recurrent neural network with functional dependence on piecewise constant argument of generalized type given by

$$x'(t) = -Ax(t) + Ex(\gamma(t)) + Bh(x_t) + Cg(x_{\gamma(t)}) + D. \quad (1)$$

Using the theoretical results obtained by Akhmet [2], we investigate conditions for exponential stability of periodic solutions for (1).

**Keywords:** Differential equations with functional dependence on piecewise constant argument, recurrent neural networks, stability, periodic solutions

## References

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