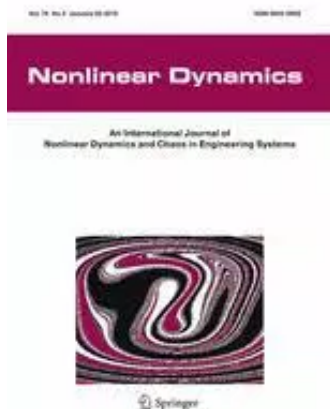


Retraction Watch

Tracking retractions as a window into the scientific process

Robot for stroke patients paper copied 3 pages of equations

without comments



A 2014 paper on a robotic system for patients who have had a stroke contains three pages of equations that are not original.

According to the retraction note, “[Cascade controller design and stability analysis in FES-aided upper arm stroke rehabilitation robotic system](#)” copied the equations from a paper that other researchers presented at a conference in 2012. The papers both describe a system that delivers a boost of electricity to stroke patients’ arms to help them perform a task.

Here’s [the note](#), from *Nonlinear Dynamics*:

This article has been retracted by the Editor-in-Chief of Nonlinear Dynamics. The stability analysis, which comprises the three-page entirety of Section 4, is an equation-by-equation copy, included without credit or citation, of Section III.C of the paper “Freeman, Christopher, Tong, Daisy, Meadmore, Katie, Hughes, Ann-Marie, Rogers, Eric and Burrridge, Jane (2012) [FES based Rehabilitation of the Upper Limb using Input/Output Linearization and ILC](#). In: 2012 American Control Conference, Montréal, 27–29 June 2012, pp. 4825–4830”.

The original article has zero citations, according to Thomson Scientific’s Web of Knowledge.

The retracted abstract describes how the robotic system assists patients:

When not enough voluntary efforts can be supplied, FES-based assistance is provided by applying electrical stimulation to the actuated muscles. In order to realize more rapid and accurate control of trajectory tracking, a new cascade control scheme is developed for the combined muscle and supported arm system. The stability of the cascade-controlled system and the internal stability of the unactuated dynamics are rigorously studied.

We’ve reached out to the EIC of the journal and to corresponding author [Chenxiao Cai](#) at the Nanjing

University of Science and Technology for more details, and will update with anything else we learn.

Hat tip: Rolf Degen

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Written by Shannon Palus

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