الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
جامعة قسنطينة 1 – الإخوة منتوري
كليـــــــــة العلوم الد قيـقة

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
Constantine 1 University – Frères Mentouri
Faculty of Exact Sciences

ANNONCE DE SOUTENANCE

Conformément à la décision n° **41/DS/2026 datée** du **01 Juin 2026** autorisant la soutenance d'une thèse de doctorat en Sciences, le Vice-doyennat chargé de la post-graduation, de la recherche scientifique et des relations extérieures, a n n o n c e la soutenance publique d'une thèse de doctorat en Sciences le :

Lundi 15 Juin 2026 à 16H00

Lieu : A la salle de conférences sise au Campus Ahmed Hamani (Zerzara)
Constantine 1 – Frères Mentouri
F i l i è r e : M A T H E M A T I Q U E S
Spécialité : A n a l y s e

Doctorant : LABED Boudjemaa

Sur le thème : « Contrôle et anti-contrôle du chaos : application à des circuits électriques non linéaires ».

Devant le jury d'examen :

	Nom et prénoms	Grade	Etablissement d'appartenance
P r é s i d e n t	ZAROUR Abdelwahab	Professeure	Université Constantine1, Frères Mentouri
Directeur de thèse	ABDELOUAHAB Mohammed Salah	Professeur	Centre Université Abdelhafid Boussouf MILA
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	REZZOUG Imad	Professeur	Université Larbi Ben M'hidi Oum el Bouaghi

Abstract

This thesis addresses two main topics:

First Topic: This study introduces a novel class of uncertain fractional-order hyper-chaotic systems subject to external disturbances. To suppress hyper-chaos in such systems, a suitable sliding mode controller has been designed. The proposed control scheme—grounded in the fundamental theoretical framework of Lyapunov stability theory—ensures the asymptotic stability of these systems. The validity and e_ectiveness of the designed controller have been confirmed through its application to fractional-order Liu and Lorenz hyper-chaotic systems, supported by comprehensive numerical simulation results.

Second Topic: This work proposes a four-dimensional memristor-based Chua circuit, with a focus on analyzing its chaotic and hyper-chaotic behaviors using phase portraits and Lyapunov exponent spectra. Given that chaotic phenomena are often undesirable in practical applications—such as robotics and electronic systems, which represent promising application domains for this circuit—our objective is to suppress such behaviors. To this end, an adaptive control strategy is proposed, accounting for unknown parameters in the model. The e_cacy of this strategy is rigorously established theoretically via Lyapunov stability theory and validated practically through numerical simulations, which visually demonstrate the successful regulation of the circuit dynamics using the proposed adaptive control approach.