Short CV

NAME

Yahao Chen

CONTACT INFORMATION

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RESEARCH INTERESTS

Linear and nonlinear differential-algebraic equations (DAEs): solution theory, feedback linearization, canonical forms, structural analysis;

Geometric methods for linear and nonlinear control systems;

Nonlinear control theory: stability and stabilization, singular perturbation, etc;

Non-smooth dynamics: Jumps and impulses of DAEs with inconsistent initial values, switched DAEs.

BACKGROUNDS

University of Groningen (RUG), the Netherlands

Postdoctoral Researcher (Applied Mathematics, September 2019-October 2021)

- Project: "*Analysis and control of switched differential algebraic equations*" (PI: S. Trenn), NWO Vidi grant 639.032.733

Institut National des Sciences Appliquées (INSA) de Rouen, France

PhD (Applied Mathematics, October 2015-June 2019)

- Dissertation: "*Geometric analysis of differential-algebraic equation control systems: linear, nonlinear and linearizable*"

Northeastern University (NEU), China

MSc (Control Science and Engineering, October 2012-July 2015)

- Dissertation: "*Anti-windup Compensator for Control Systems Subject to Actuator Saturation*"

JOURNAL PUBLICATIONS

Y. Chen* and W. Respondek (2021), Geometric analysis of differential-algebraic equations via linear control theory, *SIAM Journal on Control and Optimization*, 59, pp. 103-130.

Y. Chen*, S. Trenn and W. Respondek (2020), Normal forms and internal regularization of nonlinear differential-algebraic control systems, *International Journal of Robust and Nonlinear Control*, 31: 6562-6584.

Y. Chen* and W. Respondek (2021), From Morse triangular form of ODE control systems to feedback canonical form of DAE control systems, provisionally accepted by *Journal of the Franklin Institute*.

Y. Chen* and W. Respondek (2021), Geometric analysis of nonlinear differential-algebraic equations via nonlinear control theory, accepted by *Journal of Differential Equations*, available from https://arxiv.org/abs/2103.16711.

Y. Chen* (2021), Feedback linearization of nonlinear differential-algebraic control systems, accepted by *International Journal of Robust and Nonlinear Control*.

Y. Chen* and S. Trenn (2021), Impulse-free jump solutions for nonlinear differential-algebraic equations, submitted to *Nonlinear Analysis: Hybrid Systems*.

Y. Chen* and S. Trenn (2021), Impulse-freeness and stability of switched nonlinear differential-algebraic equations, *Under Preparation*.

Conferences Publications

Y. Chen and S. Trenn* (2022), Stability analysis of switched nonlinear differential-algebraic equations via nonlinear Weierstrass form, submitted to *European Control Conference*.

Y. Chen* and S. Trenn (2021), An approximation for nonlinear differential-algebraic equations via singular perturbation theory, *IFAC Conference on Analysis and Design of Hybrid Systems*.

Y. Chen* and S. Trenn (2021), The differentiation index of nonlinear differential-algebraic equations versus the relative degree of nonlinear control systems, PAMM, 20(1), e202000162.

Y. Chen* and S. Trenn (2021), On geometric and differentiation index of nonlinear differential-algebraic equations, *IFAC-PapersOnLine*, Volume 54, Issue 9, 2021, Pages 186-191.

Y. Chen* and W. Respondek (2019), Yahao Chen, Witold Respondek, Internal and external linearization of semi-explicit differential algebraic equations, *IFAC-PapersOnLine*, Volume 52, Issue 16, 2019, Pages 292-297.

J. Dong, Y. Chen, G.H. Yang (2014), Reliable fuzzy stabilization against sensor faults, 2014 International Conference on Mechatronics and Control (ICMC), pp. 2059-2062. IEEE.

Teaching Experience

Spring	2021	TA, Project Systems Theory, University of Groningen
Winter	2020	Lecturer, Advanced Systems Theory, University of Groningen
Spring	2018	TA, Calculus Differential, INSA de Rouen

Awards

2015-2019	Scholarship from Chinese Scholarship Council (CSC)
2012–2014	Highest distinction in general scholarship; First-Class Honours.
2013	Third Prize in National Mathematical Contest in Modeling
2012–2013	Merit Student

Graduate Coursework

- ❑ Calculus
- ❑ Linear Control Theory
- ❑ Linear Algebra
- ❑ Differential Geometry
- ❑ Partial Differential Equations
- ❑ Nonlinear Control Systems
- ❑ Differential Equations
- ❑ Analog and Digital Electronics
- ❑ Automatic Control Principal
- ❑ Matrix Analysis
- ❑ Intelligent Control Systems

Scientific Project Experience

	2013–2015	Control system design for a class of canard rotor/fixed wing aircrafts. (participate) PI: Prof.Jiuxiang Dong, Prof.Guang-Hong Yang Institute of Navigation and Control Theory, NEU, China.
	2013–2014	Research on the control system of Denso 6-Axis robot. Advisor: Prof.Jiuxiang Dong Institute of Navigation and Control Theory, NEU, China.

Relevant Skills

Languages:	English (TOEFL ibt 99), French (TCF B1), Chinese (native).
Programing:	C/C++, Python.
Others:	LaTeX, Matlab/Simulink, ROS, embedded system design (51 Single-chips, ARM STM32).

References

Prof. Stephan Trenn, Faculty of Science and Engineering Systems, Control and Applied Analysis, Bernoulli Institute, Nijenborgh 99747 AG Groningen, The Netherlands, `s.trenn@rug.nl`

Prof. Witold Respondek, Normandie Université, INSA-Rouen, LMI, 76801 Saint-Etienne-du-Rouvray, France, (0033)232956632, `witold.respondek@insa-rouen.fr`

Prof. Jiuxiang Dong, Northeastern University, School of Information Science and Engineering, 110004 Shenyang, China, `dongjiuxiang@ise.neu.edu.cn`