Short Curriculum Vitae

Konstantinos (Costas) Poulios

I am a visiting assistant professor at the Department of Economics of the University of Athens. My research activity is oriented towards Mathematical Economics and several areas of Pure and Applied Mathematics. Recently, my research interests focus on data-driven mathematical methods and its applications to complex nonlinear dynamical systems that may emerge from several areas (such as economics, physics, engineering, biology etc).

Education

I received my BSc diploma from the Department of Mathematics of the University of Athens with mark excellent. I also received my PhD diploma in Pure mathematics from the same department.

Work experience

The last two years I am a visiting assistant professor at the Department of Economics of the University of Athens. In the past, I was a post-doctoral researcher at the Department of Economics of the University of Athens. I have also worked as a research and teaching fellow in the Department of Mathematics of the University of Athens and in the Department of Mathematics of the Universoty of Crete. I also was research fellow at the Department of Mathematics of the Universitat de Extremadura (Spain). I have taught several courses in Pure and Applied Mathematics and I have written teaching notes for some of these courses.

Research

I have performed research in several areas of Mathematics and Economics. During my PhD studies, the main reseaarch activity was oriented towards Functional Analysis, Operator theory and Combinatorics. In my post-

doctor, I studied economic theory of interbank networks. Recently, my research activity focuses on data driven mathematical methods and their applications to dynamical systems. This is a very active area whose applications can be found in several disciplines, such as mathematics, physics, biological sciences etc.

Selected publications

1. E. Melas. C. Poulios, E. Camouzis, J. Leventides, N. Poulios, *Study of the hypergeometric equation via data driven Koopman-EDMD theory*, **to appear** in *Axioms*.

2. J. Leventides, E. Melas, C. Poulios, P. Boufounou, R.A. Leventides. *Designing GDP-linked bonds with default*, **to appear** in *Applied Economics Quarterly*.

3. J. Leventides, E. Melas, C. Poulios. *Extended dynamic mode decomposition for two paradigms of non-linear dynamical systems*, **to appear** in *Journal of the Franklin Institute*.

4. J. Leventides, E. Melas, C. Poulios, P. Boufounou. *Analysis of chaotic economic models through Koopman operators, EDMD, Takens' theorem and Machine Learning*, Data Science in Finance and Economics, vol. **2**, no.4, pp. 416-436, 2022.
http://www.aimspress.com/article/doi/10.3934/DSFE.2022021

5. J. Leventides, E. Melas, C. Poulios, *Extended dynamic mode decomposition for cyclic macroeconomic data*, Data Science in Finance and Economics, vol. **2**, no. 2, pp. 117-146, 2022.
http://www.aimspress.com/article/doi/10.3934/DSFE.2022006

6. J. Leventides, C. Poulios, E. Camouzis, *A discrete dynamics approach to interbank financial contagion*, IMA Journal of Mathematical Control and Information, **39**, no.2, p. 409-442, 2022.
https://doi.org/10.1093/imamci/dnab007

7. J. Leventides, N. Poulios, C. Poulios, *Random matrices and uncontrollability of dynamical systems*, IMA Journal of Mathematical Control and Information **39** no.2, p. 371-382, 2022.
https://doi.org/10.1093/imamci/dnab011

8. J. Leventides, C. Poulios, *Koopman operators and the* $3x + 1$*-dynamical system*, SIAM J. Appl. Dyn. Syst. vol. 20, no. 4, pp. 1773-1813, 2021.
https://doi.org/10.1137/20M1348182

9. V. Konstantoudis and C. Poulios, *Mathematical analysis of nanostructured surfaces: The period-scale transform*, Hindawi, Mathematical Problems in Engineering, Volume 2021, Article ID 5533673, 14 pages.
https://doi.org/10.1155/2021/5533673

10. J. Leventides, C. Poulios, A.G. Tsiatsios, M. Livada, S. Tsipras, K. Lefcaditis, P. Sargenti, A. Sargenti, *Systems theory and analysis of the implementation of non pharmaceutical policies for the mitigation of the COVID-19 pandemic*, Journal of Dynamics and Games, Volume **8**, no. 3 (2021), 167-186.
doi:10.3934/jdg.2021004

11. J. Leventides, E. Melas, C. Poulios, R. A. Leventides, *Mapping GDP linked bonds: the case of the Greek economy*, Greek Economic Outlook, Centre of Planning and Economic Research (KEPE), Volume **46**, pp. 49-62, 2021.
https://www.kepe.gr/images/oikonomikes ekselikseis/issue-46-en/mapping-gdp-linked-bonds-the-case-of-the-greek-economy.pdf

12. C. Boyd, C. Poulios and M. Venkova, *Injective tensor products of tree spaces*, Stud. Math. **246**, No. 1 (2019), 1-29.

13. C. Poulios, *The fixed point property and the Opial condition on tree-like Banach spaces*, Rocky Mountain J. Math. **45**, No. 4 (2015), 1245-1282.

14. C. Poulios and A. Tsarpalias, *Some combinatorial principles for trees and applications to tree-sequences in Banach spaces*, Math. Logic Quart. **60**, No.1-2 (2014), 70-83. https://arxiv.org/abs/1305.4186

15. C. Poulios, *Regular methods of summability on tree-sequences in Banach spaces*, Proc. Amer. Math. Soc. **139**, No. 1 (2011), 259-271.

Selected presentation in conferences with peer review

1. J. Leventides, E. Melas, C. Poulios, A. Vardulakis. *Data arising from hyperchaotic financial systems. Control through Koopman operators and EDMD*, 4th International Conference on Industrial Artificial Intelligence, August 24-27, 2022 Shenyang, Liaoning, China.

2. J. Leventides, E. Melas, C. Poulios. *Koopman operators and Extended Dynamic Mode Decomposition for a pair of forward and reverse chemical reactions which occur simultaneously*, 4th International Conference on Industrial Artificial Intelligence, August 24-27, 2022 Shenyang, Liaoning, China.

3. J. Leventides, E. Melas, C. Poulios. *Koopman operators and Extended dynamic mode decomposition for the inverted pendulum*, 4th International Conference on Industrial Artificial Intelligence, August 24-27, 2022 Shenyang, Liaoning, China.

4. J. Leventides, E. Melas, C. Poulios. *EDMD methods for analysis and prediction of bilinear compartmental models*, 4th International Conference on Industrial Artificial Intelligence, August 24-27, 2022 Shenyang, Liaoning, China.

5. J. Leventides, C. Poulios, *An operator theoretic approach to the* $3x+1$ *dynamical system*, IFAC-PapersOnLine, vol. 54 no. 9, 2021, pp. 225-230,https://doi.org/10.1016/j.ifacol.2021.06.079
(Proceedings of the 24th International Symposium on Mathematical Theory of Networks and Systems MTNS 2020, Cambridge, United Kingdom)

6. J. Leventides, C. Poulios, *Dynamical systems and interbank networks*, IFAC-PapersOnLine, vol. 54 no. 9, 2021, pp. 90-94, https://doi.org/10.1016/j.ifacol.2021.06.066
(Proceedings of the 24th International Symposium on Mathematical Theory of Networks and Systems MTNS 2020, Cambridge, United Kingdom)

7. V. Constantoudis, K. Poulios, M. Chatzigeorgiou, G. Papavieros. *Computational nanometrology of nanostructures: the challenge of spatial complexity*, Proceedings of the 18th International Congress of Metrology, Article number 13001, 8 pages, Paris, France, September 19-21, 2017.
https://doi.org/10.1051/metrology/201713001