

Orthogonality and probability: beyond nearest neighbor transitions

Yevgeniy V Kovchegov, *Oregon State University*

Abstract

In this article, we will explore why Karlin-McGregor method of using orthogonal polynomials in the study of Markov processes was so successful for one dimensional nearest neighbor processes, but failed beyond nearest neighbor transitions. We will proceed by suggesting and testing possible fixtures.

Full text: [PDF](#) | [PostScript](#)

Pages: 90-103

Published on: February 16, 2009

Bibliography

1. N.I.Aheizer and M.G.Krein. Some questions in the theory of moments. Translated by W. Fleming and D. Prill. *Translations of Mathematical Monographs, Vol. 2 American Mathematical Society, Providence, R.I.* (1962) v+265 pp. [MR0167806\(29 #5073\)](#)
2. P.Deift. Orthogonal Polynomials and Random Matrices: A Riemann-Hilbert Approach. *Amer. Math. Soc., Providence, RI, (2000)*. [MR1677884](#)
3. P.Deift. Riemann-Hilbert Methods in the Theory of Orthogonal Polynomials *Spectral Theory and Mathematical Physics* 76 (2006), 715-740, Amer. Math. Soc., Providence, RI [MR2307753](#)
4. H.Dym and H.P.McKean. Gaussian processes, function theory, and the inverse spectral problem *Probability and Mathematical Statistics* 31 (1976), 435-451. Academic, New York - London [MR0448523](#)
5. M.L.Gorbachuk and V.I.Gorbachuk. M.G.Krein's Lectures on Entire Operators *Birkhäuser Verlag* (1997) Math. Review number not available.
6. F.A. Grünbaum. Random walks and orthogonal polynomials: some challenges *Probability Geometry and Integrable Systems - MSRI Publications* 55 (2007), 241-260 [MR2407600](#)
7. S.Karlin. Total Positivity *Stanford University Press, Stanford, CA* (1968) [MR0230102](#)
8. S.Karlin and J.L.McGregor. The differential equations of birth and death processes, and the Stieltjes moment problem *Transactions of AMS*, 85, (1957), 489-546 [MR0091566](#)
9. S.Karlin and J.L.McGregor. The classification of birth and death processes *Transactions of AMS*, 86, (1957), 366-400 [MR0094854](#)
10. S.Karlin and J.L.McGregor. Random Walks *Illinois Journal of Math.*, 3, No.1, (1959), 417-431. [MR0100927](#)
11. S.Karlin and J.L.McGregor. Occupation time laws for birth and death processes *Proc. 4th Berkeley Symp. Math. Statist. Prob.*, 2, (1962), 249-272 [MR0137180](#)
12. S.Karlin and J.L.McGregor. Linear Growth Models with Many Types and Multidimensional Hahn Polynomials *R.A. Askey, Editor, Theory and Applications of Special Functions*, Academic Press, New York, (1975), 261-288 [MR0406574](#)
13. Y.Kovchegov, N.Meredith and E.Nir Occupation times via Bessel functions *preprint Math*. Review number not available.
14. A.B.J.Kuijlaars. Riemann-Hilbert Analysis for Orthogonal Polynomials *Orthogonal Polynomials and Special Functions* (Springer-Verlag), 1817, (2003) [MR2022855](#)
15. W.Schoutens. Stochastic Processes and Orthogonal Polynomials. *Lecture notes in statistics* (Springer-Verlag), 146, (2000) [MR1761401](#)
16. G.Szegő. Orthogonal Polynomials. Fourth edition. *AMS Colloquium Publications*, 23, (1975) [MR0372517](#)

Research Support Tool

[Capture Cite](#)
[View Metadata](#)
[Printer Friendly](#)

▼ [Context](#)

[Author Address](#)

▼ [Action](#)

[Email Author](#)
[Email Others](#)



[Home](#) | [Contents](#) | [Submissions, editors, etc.](#) | [Login](#) | [Search](#) | [EJP](#)

[Electronic Communications in Probability](#). ISSN: 1083-589X