Institut für Angewandte Mathematik
Prof. P.L. Ferrari
Sommer Semester 2020

universitätbonn iam

Hauptseminar Stochastik
Point processes

Zeit und Raum: Donnerstag 14-16, LWK N0.003

Point processes

1. Definition of point processes and examples like Poisson point process (with link to the one defined by Markov Chain) (**Gri 6.13; Fer 4.1**)
2. Correlation function, relation with moments, gap probability; determinantal class (**Fer 3.1;4**)
3. Application to GUE random matrix eigenvalues (**Fer 2.1-2.2;3.2**)
4. Non-coinciding probabilities for birth-death processes: Karlin-McGregor theorem (and its graph generalization) (**KMcG, Fer 7.1,7.5**)
5. Longest increasing subsequences: from patience sorting to the Baik-Deift-Johansson theorem, part I (**AD**)
6. Longest increasing subsequences: from patience sorting to the Baik-Deift-Johansson theorem, part II (**AD**)

Renewals

7. Definition of Renewals, renewal equation and theorem (**Gri 10.1-10.2**)
8. Applications of renewal processes (**Gri 10.3-10.4**)
9. Renewal-reward processes (**Gri 10.5**)
10. Renewals and queues, Applications (**Gri 11**)

- Besprechung bzw. Fragen: in der Regel: während der Woche vor eigenen Seminar.
- Man sollte anwesend sein, auch wenn andere vortragen!

References

(Gri) G. Grimmett and D. Stirzaker, *Probability and Random Processes*, Oxford Press

(Fer) P.L. Ferrari, *TU Lecture on random matrices 2007*, Online on my homepage (also *Lecture notes of the Beg Rohu Summer School 2008* and My PhD thesis, Section 3)

(KMcG) S. Karlin and L. McGregor, *Coincidence probabilities*, Pacific J. **9**, (1959) 1141–1164.

(AD) D. Aldous and P. Diaconis, *Longest increasing subsequences: from patience sorting to the Baik-Deift-Johansson theorem*, Bull. Amer. Math. Soc. **36** (1999) 413–432.