## References

Axel, F. and Gratias, D. (1995). Behond Quasicrystals. Berlin–Heidelber–New York: Springer.

- Ban, J., Hu, W.G. Lin, S., and Lin, Y. (2015). Verification of mixing properties in two-dimensional shifts of finite type. *preprint arXiv:1112.2471v2*.
- Beal, M. P., Fiorenzi, F., and Mignosi, F. (2005.). Minimal forbidden patterns of multi-dimensional shifts. Int. J. Algebra Comput., 15:DOI: 10.1142/S0218196705002165.
- Berger, R. (1966). The undecidability of the domino problem. Mem. Amer. Math. Soc., No. 66:-.
- Boyle, M., Pavlov, R., and Schraudner, M. (2010). Multidimensional sofic shifts without separation and their factors. *Transactions of the American Mathematical Society*, 362, NO. 9:4617–4653.
- Forrest, A., Hunton, J., and Kellendonk, J. (2002). Cohomology of canonical projection tilings. Communications in Mathematical Physics, Springer-Verlag 2002, 226:289–322.
- Hadamard, J. (1898). Les surfaces à courbures opposées et leurs lignes géodésiques. J. Math. Pures Appi., 5:27–74.
- Hochma, G., Michael, M., Ettore, F., and Valcher, M. E. (2013). Symbolic dynamics of boolean control networks. *Automatica*, 49, Issue-8:2525–2530.
- Hochman, M. (2009). On dynamics and recursive properties of multidimensional symbolic dynamics. Inventiones Mathematica,, 176 No:1.
- Hochman, M. and Meyerovitch, T. (2010). A characterization of the entropies of multidimensional shifts of fnite type. *Annals of Mathematics*, 171, No: 3:2011–2038.
- Janot, C. and Mosseri, R. (1995). Proc. 5th Int. Conf. on Quasicrystals. Singapore: World Scientific.
- Khatkhate, A., Ray, A., Keller, E., Gupta, S., and Chin, S. C. (2006). Symbolic time-series analysis for anomaly detection in mechanical systems. *IEEE/ASME TRANSACTIONS ON MECHATRONICS*, 11, No. 4:439–447.
- Lightwood, S. (2003). Morphisms from non-periodic Z<sup>2</sup>-subshifts-I: Constructing embeddings from homomorphisms. *Ergodic Theory Dynam. Systems*, 23, No. 2:587–609.
- Lind, D. and Marcus, B. (1995). An introduction to symbolic dynamics and coding. Cambridge University Press, Cambridge.
- Mallapragada, G., I, C., and A., R. (2008). Automated behaviour recognition in mobile robots using symbolic dynamic filtering. Proceedings of the Institution of Mechanical Engineers, Part I: Journal of Systems and Control Engineering, 222(6):409–424.
- Moody, R. (1997). The Mathematics of Long Range Aperiodic Order. Dordrecht: Kluwer.
- Patankar, R., Rajagopalan, V., and Ray, A. (2008). Failure precursor detection in complex electrical systems using symbolic dynamics. Int. J. Signal and Imaging Systems Engineering, 1, No. 1:68–77.
- Pavlov, R. and Schraudner, M. (2015). Classification of sofic projective subdynamics of multidimensional shifts of finite type. Trans. Amer. Math. Soc., 367.
- Quas, A. and Trow, P. (2000.). Subshifts of multidimensional shifts of finite type. Ergodic Theory and Dynamical Systems, 20 (03):859–874.
- Robinson, R. (1971). Undecidability and nonperiodicity for tilings of the plane. *Invent. Math.*, 12:177–209.
- Schmidt, K. (2001.). Multi-dimensional symbolic dynamical systems. Codes, Systems and graphical models, Springer, New York.
- Shannon, C. (1948). A mathematical theory of communication. The Bell System Techical. Journal, 27, Issue 3:379–423.

Steinhardt, P. and Ostlund, S. (1987). *The Physics of Quasicrystals*. Singapore: World Scientific. Voss, A., Wessel, N., Baier, V., Osterziel, K., Kurths, J., Dietz, R., and Schirdewan, A. (2000).

Symbolic dynamics - a powerful tool in non-invasive biomedical signal processing. Proceedings. Vries, J. (2014). Topological Dynamical Systems: An Introduction to the Dynamics of Continuous Mappings. Walter de Gruyter GmbH, Berlin/Boston.

Wang, H. (1961). Proving theorems by pattern recognition—II. Bell System Technical Journal, 40 (1):1–41.

# CURRICULUM VITAE

Dileep Kumar S/O Jageshvar House No. 39-Kha Shahid Kunj Bihari Mohalla Gahrauli, Hamirpur, 210506 (U.P.) Email: pg201383502@iitj.ac.in Mob. No: 8209834292

### **Educational Qualification**

- $\bullet\,$  M. Sc. (Applied Mathematics) from Indian Institute of Technology, Roorkee in 2013 .
- B. Sc. (PCM) from V. S. S. D. College Nawabganj Kanpur, C. S. J. M. University, Kanpur in 2011.

#### **Research Experience**

- Junior research fellow in the department of mathematics at IIT Jodhpur from 27/12/2013 to 26/12/2015.
- Senior research fellow in the department of mathematics at IIT Jodhpur from 27/12/2015 to 26/12/2018.
- Master's dissertation project on "Markovian Queue With Working Vacation and Unreliable Server" in the department of mathematics at Indian Institute of Technology Roorkee from 20/12/2012 to 17/05/2013

#### Academic Achievements and Awards

- Qualified GATE (Mathematics) Exam 2013 : All India Rank 568, percentile 88.56
- Qualified JAM (Joint Admission Test for M.Sc.) (Mathematics) Exam 2011 : All India Rank-601.

#### Workshop/Conferences/Short Term Courses

- Attended workshop on Advanced Instructional School on "ERGODIC THEORY AND DYNAMICAL SYSTEMS" held at Indian Institute of Technology, Delhi from 4-23 Dec. 2017.
- Attended International workshop and conference on "TOPOLOGY AND APPLICATIONS" (Annual conference of Kerala Mathematical Association) held from December 5th to December 11th, 2018 at Rajagiri School of Engineering and Technology Kochi, Kerala.
- Attended "DST-SERC School on Nonlinear Dynamics" held from December 1th to December 20th, 2014 at Central Unversity of Rajasthan, India.

## **Tutorials Conducted**

- Complex Analysis and Differential Equations.
- Linear Algebra and Calculus.

### **Publications:**

- Sharma P., Kumar D. "Matrix Characterization of Multidimensional Subshift of Finite Type". Applied General Topology, Vol. 20, No. 2, pp. 407-418, Oct. 2019.
- Sharma P., Kumar D. "Multidimensional Shifts and Finite Matrices". (Under revision).
- Sharma P., Kumar D. "On Periodicity In Multidimensional Shift Spaces". (Under review).

### Software Skills

• Knowledge of MATLAB, LATEX, Microsoft Word, Power point, Excel.