

## ON STATISTICAL $\omega$ -LIMIT SETS IN A DISCRETE DYNAMICAL SYSTEM

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*Abstract.* Following the concept of statistical convergence, in this paper we introduce two more subtle notions, viz. statistical  $\omega$ -limit set and statistical  $\omega$ -cluster set than the general  $\omega$ -limit set in a discrete dynamical system of a continuous function and study some properties related to these two points.

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### REFERENCES

- [1] S. J. AGRONSKY, A. M. BRUCKNER, J. G. CEDER, AND T. L. PEARSON, *The structure of  $\omega$ -limit sets for continuous functions*, Real Anal. Exchange, **15**, 2 (1989/90), 483–510.
- [2] F. BALIBREA AND V. JIMÉNEZ LÓPEZ, *A characterization of the  $\omega$ -limit sets of planar continuous dynamical systems*, J. Differential Equations, **145**, 2 (1998), 469–488.
- [3] F. BALIBREA AND C. LA PAZ, *A characterization of the  $\omega$ -limit sets of interval maps*, Acta Math. Hungar., **88**, 4 (2000), 291–300.
- [4] A. D. BARWELL, CHRIS GOOD, PIOTR OPROCHA AND BRIAN E. RAINES, *Characterizations Of  $\omega$ -Limit Sets In Topologically Hyperbolic Systems*, Discrete And Continuous Dynamical Systems, **33**, 5 (May 2013), 1819–1833.
- [5] A. BLOKH, A. M. BRUCKNER, P. D. HUMKE, AND J. SMÍTAL, *The space of  $\omega$ -limit sets of a continuous map of the interval*, Trans. Amer. Math. Soc., **348**, 4 (1996), 1357–1372.
- [6] L. S. BLOCK AND W. A. COPPEL, *Dynamics in one dimension, volume 1513 of Lecture Notes in Mathematics*, Springer-Verlag, Berlin, 1992.
- [7] B. C. TRIPATHY, *Statistically convergent double sequences*, Tamkang Journal of Mathematics, **34**, 3 (2003), 231–237.
- [8] E. SAVAS AND P. DAS, *A generalized statistical convergence via ideals*, Applied mathematics letters, **24**, 6 (2011), 826–830.
- [9] H. FAST, *Sur la convergence statistique*, Colloq. Math., **2**, (1959), 241–244.
- [10] J. A. FRIDY, *On Statistical Convergence*, Analysis, **5**, 4 (1985), 301–313.
- [11] J. A. FRIDY, *Statistical Limit Points*, Proc. Amer. Math. Soc., **118**, 4 (1993), 1187–1192.
- [12] D. K. GANGULY AND BABLU BISWAS, *Order statistical convergence in a metric space*, Investigations in Mathematical Sciences, **4**, 2 (2014), 11–23.
- [13] F. NURAY, E. SAVAS, *Statistical convergence of sequences of fuzzy numbers*, Mathematica Slovaca, **45**, 3 (1995) 269–273.
- [14] M. W. HIRSCH, H. L. SMITH, AND X. ZHAO, *Chain transitivity, attractivity, and strong repellers for semidynamical systems*, J. Dynam. Differential Equations, **13**, 1 (2001), 107–131.
- [15] P. KOSTYRKO, M. MACAJ, T. SALAT AND O. STRAUCH, *On Statistical Limit Points*, Proc. Amer. Math. Soc., **129**, 9 (2000), 02647–02654.
- [16] I. J. MADDOX, *Statistical convergence in a locally convex space*, Math. Proc. Cambridge Philos. Soc., **104** (1988), 141–145.
- [17] H. I. MILLER, *A measure theoretical subsequence characterization of statistical convergence*, Trans. Amer. Math. Soc., **374**, 5 (1995), 1811–1819.

- [18] I. NIVEN, H. S. ZUCKERMAN, *An Introduction to the Theory of Numbers*, John Wiley & Sons, New York, USA, 4-th edition, Chapter-11, 1980.
- [19] T. SALAT, *On statistically convergence sequences of real numbers*, *Math. Slovaca*, **30**, (1980), 139–150.
- [20] O. M. SARKOVSKI, *Continuous mapping on the limit points of an iteration sequence*, *Ukrain. Mat. Z.*, **18**, 5 (1996), 127–130.
- [21] I. J. SCHOENBERG, *The integrability of certain functions and related summability methods*, *Amer. Math. Monthly*, **66**, 5 (1959), 361–375.
- [22] H. STEINHAUS, *Sur la convergence ordinaire et la convergence asymptotique*, *Colloq. Math.*, **2** (1951), 73–74.
- [23] S. PEHLIVAN, M. GÜRDAL, AND B. FISHER, *Lacunary statistical cluster points of sequences*, *Mathematical Communications*, **11** (2006), 39–46.
- [24] M. GÜRDAL AND U. YAMANCI, *Statistical convergence and some questions of operator theory*, *Dynamic systems and Applications*, **24** (2015), 305–312.
- [25] U. YAMANCI AND M. GÜRDAL, *Statistical convergence and operators on Fock space*, *New York J. Math.*, **22** (2016), 199–207.
- [26] A. A. NABIEV, E. SAVAS, M. GÜRDAL, *Statistically Localized Sequences in Metric Spaces*, *Journal of Applied Analysis and Computation*, **9**, 2 (2019), 739–746.