

Some Extensions of an Inequality of Vapnik and Chervonenkis

Dmitriy Panchenko, *University of New Mexico*

Abstract

The inequality of Vapnik and Chervonenkis controls the expectation of the function by its sample average uniformly over a VC-major class of functions taking into account the size of the expectation.

Using Talagrand's kernel method we prove a similar result for the classes of functions for which Dudley's uniform entropy integral or bracketing entropy integral is finite.

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

Pages: 55-65

Published on: January 17, 2002

Bibliography

1. Boucheron, S., Lugosi, G., Massart, P. (2000), *A sharp concentration inequality with applications*, Random Structures Algorithms, 16, 277 - 292. [Math. Review 2001m:26072](#)
2. Dembo, A. (1997), *Information inequalities and concentration of measure*, Ann. Probab., 25, 527 - 539. [Math. Review 98e:60027](#)
3. Dudley, R.M. (1999), *Uniform Central Limit Theorems*, Cambridge University Press. [Math. Review 2000k:60050](#)
4. Haussler, D. (1995), *Sphere packing numbers for subsets of the boolean n-cube with bounded Vapnik-Chervonenkis dimension*, J. Combin. Theory Ser. A, 69, 217 - 232. [Math. Review 96f:52027](#)
5. Kohler, M. (2000), *Inequalities for uniform deviations of averages from expectations with applications to nonparametric regression*, J. Statist. Plann. Inference, 89, no. 1-2, 1 - 23. [Math. Review 2001k:62065](#)
6. Ledoux, M. (1996), *On Talagrand's deviation inequalities for product measures*, ESAIM: Probab. Statist., 1, 63 - 87. [Math. Review 97j:60005](#)
7. Li, Y., Long, P.M., Srinivasan, A. (2001), *Improved bounds on the sample complexity of learning*, Journal of Computer and System Sciences, 62, 516 - 527. [Math. Review 1 824 457](#)
8. Massart, P. (2000), *About the constants in Talagrand's concentration inequalities for empirical processes*, Ann. Probab., 28, 863 - 885. [Math. Review 2001m:60038](#)
9. Panchenko, D. (2001), *A note on Talagrand's concentration inequality*, *Elect. Comm. in Probab.*, 6, 55 - 65. [Math. Review 1 831 801](#)
10. Panchenko, D. (2001), *New zero-error bounds for voting algorithms*, preprint.
11. Rio E. (2000), *Inegalites exponentielles pour les processus empiriques*, C.R. Acad. Sci. Paris, t.330, Serie I, 597 - 600. [Math. Review 2000m:60020](#)
12. Rio E. (2001), *Inegalites de concentration pour les processus empiriques de classes de parties*, Probab. Theory Relat. Fields, 119, 163 -175. [Math. Review 2001m:60042](#)
13. Talagrand, M. (1995), *Concentration of measure and isoperimetric inequalities in product spaces*, Publications Mathematiques de l'I.H.E.S. 81, 73 - 205. [Math. Review 97h:60016](#)
14. Talagrand, M. (1996), *New concentration inequalities in product spaces*, Invent. Math., 126, 505 - 563. [Math. Review 99b:60030](#)
15. van der Vaart, A., Wellner, J. (1996), *Weak Convergence and Empirical Processes: With Applications to Statistics*, John Wiley & Sons, New York. [Math. Review 97g:60035](#)
16. Vapnik, V.N., Chervonenkis, A.Ya. (1968), *On the uniform convergence of*

Research Support Tool

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

▼ [Context](#)

[Author Address](#)

▼ [Action](#)

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

relative frequencies of event to their probabilities, Soviet Math. Dokl., 9, 915 - 918.

17. Vapnik, V., Chervonenkis, A. (1974), Theory of Pattern Recognition: Statistical problems of learning, Nauka, Moscow. [Math. Review 57:14274](#)
18. Vapnik, V.N. (1998), Statistical Learning Theory, Wiley, New York. [Math. Review 99h:62052](#)



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

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