

Contents

Part I History of VC Theory

1 Chervonenkis’s Recollections	3
Alexey Chervonenkis	
2 A Paper that Created Three New Fields: Teoriya Veroyatnostei i Ee Primeneniya 16(2), 1971, pp. 264–279	9
R.M. Dudley	
3 On the Uniform Convergence of Relative Frequencies of Events to Their Probabilities	11
V.N. Vapnik and A.Ya. Chervonenkis	
4 Sketched History: VC Combinatorics, 1826 up to 1975	31
R.M. Dudley	
5 Institute of Control Sciences Through the Lens of VC Dimension	43
Vasily N. Novoseltsev	

Part II Reviews of Measures of Complexity

6 VC Dimension, Fat-Shattering Dimension, Rademacher Averages, and Their Applications	57
Vladimir V. V’yugin	
7 Around Kolmogorov Complexity: Basic Notions and Results	75
Alexander Shen	

8	Predictive Complexity for Games with Finite Outcome Spaces . . .	117
	Yuri Kalnishkan	

Part III Making VC Bounds More Accurate

9	Making Vapnik–Chervonenkis Bounds Accurate	143
	Léon Bottou	
10	Comment: Transductive PAC-Bayes Bounds Seen as a Generalization of Vapnik–Chervonenkis Bounds	157
	Olivier Catoni	
11	Comment: The Two Styles of VC Bounds	161
	Vladimir Vovk	
12	Rejoinder: Making VC Bounds Accurate	165
	Léon Bottou	

Part IV Advances in VC Theory

13	Measures of Complexity in the Theory of Machine Learning	171
	Alexey Chervonenkis	
14	Classes of Functions Related to VC Properties	185
	R.M. Dudley	
15	On Martingale Extensions of Vapnik–Chervonenkis Theory with Applications to Online Learning	197
	Alexander Rakhlin and Karthik Sridharan	
16	Measuring the Capacity of Sets of Functions in the Analysis of ERM	217
	Ingo Steinwart	
17	Algorithmic Statistics Revisited	235
	Nikolay Vereshchagin and Alexander Shen	
18	Justifying Information-Geometric Causal Inference	253
	Dominik Janzing, Bastian Steudel, Naji Shajarisales and Bernhard Schölkopf	

19 Interpretation of Black-Box Predictive Models 267
Vladimir Cherkassky and Sauprik Dhar

20 PAC-Bayes Bounds for Supervised Classification 287
Olivier Catoni

21 Bounding Embeddings of VC Classes into Maximum Classes 303
J. Hyam Rubinstein, Benjamin I.P. Rubinstein and Peter L. Bartlett

22 Strongly Consistent Detection for Nonparametric Hypotheses 327
László Györfi and Harro Walk

**23 On the Version Space Compression Set Size and Its
Applications** 341
Ran El-Yaniv and Yair Wiener

24 Lower Bounds for Sparse Coding 359
Andreas Maurer, Massimiliano Pontil and Luca Baldassarre

25 Robust Algorithms via PAC-Bayes and Laplace Distributions. . . . 371
Asaf Noy and Koby Crammer

Index 395



<http://www.springer.com/978-3-319-21851-9>

Measures of Complexity

Festschrift for Alexey Chervonenkis

Vovk, V.; Papadopoulos, H.; Gammerman, A. (Eds.)

2015, XXXI, 399 p. 47 illus., 30 illus. in color., Hardcover

ISBN: 978-3-319-21851-9