

Index

$A_1(\mathscr{D})$, 416	$\Delta\alpha_V$, 17
$A_q^{r,b}$, 63	$\varepsilon_k(A, X)$, 323
$B_m(f)$, 76	$\kappa_m(F)$, 74
$D(X, m, d)_\infty$, 248	$\Lambda_m(\cdot, \xi)$, 246
$D_F(\xi, \Lambda, m, d)_q$, 250	$\Lambda_m(F, \xi)$, 73
$E_n^r(F)_p$, 108	ξ_m , 416
$F_r(x, \alpha)$, 25	$\sigma_K(f, \mathscr{D})$, 387
$G_n(x)$, 12	$\sigma_m(f_0, \mathscr{D})$, 422
H_q^r , 25	$\Sigma_K(\mathscr{D})$, 387
$H_q^r B$, 27	$\Sigma_m(\mathscr{D})$, 422
$H_q^r B$, 105	$\Phi_n(f)$, 273
$IA(\varepsilon)$, 258, 455	Abel's inequality, 506
$I_m(f)$, 76	Abel's transformation, 506
$(I_\alpha' \phi)(x)$, 25	basis
$J_n^a(x)$, 11	democratic, 391
$N_\varepsilon(A)$, 321	weight-democratic, 412
$P_j(x)$, 11	weight-greedy, 412
$P_m(f, \mathbf{a})$, 284	unconditional, 391
$Q_j(x)$, 11	Bernoulli kernel, 25, 517
$R(D, \delta)$, 428	multivariate, 130, 518
$R_m(f)$, 76	Bernstein inequalities, 18, 19, 89, 151
$R_N(\mathbf{x})$, 84	Bernstein–Nikol'skii inequalities, 22, 89, 151
$S(q, l, k)$, 14	Bernstein's theorem, 59
S_n , 8	Condition B, 456
$W_{q,\alpha}^r$, 25	conjugate polynomial, 8
$W_{q,\alpha}^r B$, 26	cotype constant, 337
$W_{q,\alpha}^r B$, 105	covering number, 321
$\mathbf{W}_{q,\alpha}^r$, 130	cubature formula, 246
$\mathscr{A}$, 423	error, 246
$\mathscr{A}_s(x)$, 18	democratic basis, 391
$\mathscr{A}_s(\mathbf{x})$, 85	dictionary, 392, 415
$\mathscr{D}_n(x)$, 6	almost greedy, 423
$\mathscr{D}_N(\mathbf{x})$, 82	D-dominating, 427
$\mathscr{D}^\pm$, 416	(K, D)-unconditional, 426
$\mathscr{H}_p$, 390	Nikol'skii-type $\ell_1 X$ property, 426
$\mathscr{T}(n)$, 6	ϕ -greedy, 423
$\mathscr{K}_{n-1}(x)$, 9	Riesz, 428
$\mathscr{K}_N(\mathbf{x})$, 83	symmetric, 415
$\mathscr{RT}(n)$, 6	direct theorems of approximation theory, 3, 30
$\mathscr{V}_{m,n}(x)$, 9	Dirichlet kernel, 138
$\mathscr{V}_N(\mathbf{x})$, 84	

- multivariate, 82
 - order n , 6
- Dirichlet–Jordan criterion, 56
- discrepancy, 248
- entropy
 - Kolmogorov, 321
 - metric, 321
- entropy numbers, 323
- ε -distinguishable set, 322
- error of best approximation, 387
- error of best m -term approximation, 422
- Fejér kernel
 - dyadic block, 85
 - modified, 12
 - multivariate, 83
 - order $n - 1$, 9
- Fibonacci cubature formulas, 273
- optimality, 283
- Fourier width, 5
- Frolov cubature formulas, 289
- Gaussian sums, 14
- greedy algorithm (GA), 388
 - incremental, 455
 - thresholding (TGA), 388
 - weak Chebyshev (WCGA), 392, 415
 - weak orthogonal (WOGA), 392
- greedy basis, 389
- Hardy–Littlewood inequality, 514
- Hardy–Littlewood theorem, 61
- Hausdorff–Young theorem, 511
- Hölder’s inequality, 502
- hyperbolic cross, 131
 - step, 132
- hyperbolic layer, 339
- incoherence property, 426
- incremental algorithm, 258, 455
- interpolation operator, 76
- inverse theorems of approximation theory, 3, 30
- Jackson inequalities, 3
- Jackson kernel, 11
- (K, q) -discrepancy, 257
- K -sparse, 387
- Kolmogorov width, 4
- Korobov cubature formulas, 130, 284
- L_p -equivalence, 391
- L_q -discrepancy, 257
- ℓ_1 -incoherence property, 427
- lacunary polynomials, 145
- large smoothness, 274, 285
- Lebesgue-type inequality, 389, 423, 426
- linear methods, 181
- linear width, 5
- Littlewood–Paley theorem, 513
- Marcinkiewicz’ theorem, 22, 101
- Minkowski’s inequality, 504
- mixed smoothness classes, 129
- modulus of continuity, 54
- (n, l) -net, 266
- Nikol’skii class, 81, 517
 - isotropic, 105
- Nikol’skii inequalities, 22, 90, 158
- Nikol’skii’s duality theorem, 509
- Nikol’skii-type $\ell_1 X$ inequality, 426
- nonlinear m -term approximation, 253
- orthogonal matching pursuit (OMP), 424
- orthowidth, 5
- Poisson formula, 294
- polynomials with mixed structure, 145
- property R , 141
- property S , 141
- property S_1 , 141
- quadrature formula, 246
- quasi-greedy basis, 443, 444
- (r, α) -derivative, 130
- $(\mathbf{r}, \alpha)$ -derivative, 89
- r -discrepancy, 250
- recovery operator, 76
- restricted isometry property (RIP), 424, 428
- Riesz products, 146
- Riesz–Thorin theorem, 512
- Rudin–Shapiro polynomial, 11
 - generalized, 14
 - multivariate, 84
- sampling, 76, 124
- $SG(n)$, 268
- small ball inequality, 146
- small smoothness, 276, 494
- Smolyak’s algorithm, 187
- Sobolev class, 81, 517
 - anisotropic, 105
 - isotropic, 105
- sparse approximation, 422
- sparse grid, 268
- Stechkin’s criterion, 61
- Stechkin’s lemma, 62
- Telyakovskii polynomials, 141
- thresholding greedy algorithm (TGA), 388, 423
- translation invariance, 336
- trigonometric conjugate operator, 8
- trigonometric polynomial of order n , 6
- unconditional basis, 391
- uniformly smooth Banach space, 416
- universal cubature formulas, 302
- universality, 191
- de la Vallée Poussin inequality, 32
- de la Vallée Poussin kernels, 9, 139
 - multivariate, 84
- de la Vallée Poussin operator, 10
- volume estimates, 85

534

Index

- weak Chebyshev greedy algorithm (WCGA), 388,
392, 416, 424

weak orthogonal greedy algorithm (WOGA),
392
- weak orthogonal matching pursuit (WOMP),
392, 429

Weierstrass' theorem, 56

Young's inequality, 505