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Index of Statements

Index of Notation

$\mathbb{R}$: the real numbers
$\overline{\mathbb{R}}$: the extended real numbers
$\mathbb{N}$: the natural numbers
$\mathbb{Q}$: the rational numbers
$\mathbb{B}$: closed unit ball
$|x|$: Euclidean norm
$\langle x, y\rangle$: canonical inner product
$\mathcal{C}^{k+}$: strictly continuous derivatives
$C \setminus D$: relative complement
$\operatorname{bdry} C$: boundary
$\operatorname{cl} C$: closure
$\operatorname{int} C$: interior
$\operatorname{rint} C$: relative interior
$\operatorname{csm} C$: cosmic closure
$\operatorname{hzn} C$: horizon
$\operatorname{con} C$: convex hull of set C
$\operatorname{con} f$: convex hull of function f
$\operatorname{pos} C$, $\operatorname{pos} f$: positive hull
$\operatorname{dom} f$: effective domain
$\operatorname{epi} f$: epigraph
$\operatorname{hypo} f$: hypograph
$\operatorname{dir} w$: the direction of w
$\operatorname{gph} S$: graph of S
$\operatorname{cl} f$: lsc regularization
$\operatorname{cl} S$: graphical closure
$\operatorname{lip} f$: Lipschitz modulus of function f
$\operatorname{lip} F$, $\operatorname{lip} S$: Lipschitz modulus of mappings
C^∞: horizon cone
f^∞: horizon function
S^∞: horizon mapping
$\operatorname{lev}_{\leq \alpha} f$: lower level set
$\mathrm{d} f(\bar{x})$: subderivative function
$\widehat{\mathrm{d}} f(\bar{x})$: regular subderivative function
$\partial f(\bar{x})$: subgradient set
$\widehat{\partial} f(\bar{x})$: regular subgradient set
$\partial^\infty f(\bar{x})$: horizon subgradient set
$\bar{\partial} f(\bar{x})$: convexified subgradient set
$\mathrm{d}^2 f(\bar{x})$, $\mathrm{d}^2 f(\bar{x} \,|\, v)$: second subderivatives
$e_\lambda f$: Moreau envelope
$P_\lambda f$: proximal mapping
P_C: projection mapping
$T_C(\bar{x})$: tangent cone
$\widehat{T}_C(\bar{x})$: regular tangent cone
$N_C(\bar{x})$: normal cone
$\widehat{N}_C(\bar{x})$: regular normal cone
$R_C(\bar{x})$: local recession cone
K^*: polar cone
C°: polar set
f^*, f^{**}: conjugate, biconjugate
δ_C: indicator function
σ_C: support function
γ_C: gauge function
$d_C(x)$, $d(x, C)$: distance from C
logexp: log-exponential function
vecmax: vector-max function
$DS(\bar{x} \,|\, \bar{v})$, $DS(\bar{x})$: graphical derivative
$\widehat{D}S(\bar{x} \,|\, \bar{v})$, $\widehat{D}S(\bar{x})$: regular derivative
$D^*S(\bar{x} \,|\, \bar{v})$, $D^*S(\bar{x})$: coderivative
$\widehat{D}^*S(\bar{x} \,|\, \bar{v})$, $\widehat{D}^*S(\bar{x})$: regular coderivative
$D_*S(\bar{x} \,|\, \bar{v})$, $D_*S(\bar{x})$: strict derivative
$f \mathbin{\#} g$: epi-addition
$\lambda \star f$: epi-multiplication
$\mathcal{N}(\bar{x})$: neighborhood collection
$\mathcal{N}_\infty$: subsets of $\mathbb{N}$ containing all ν sufficiently large
$\mathcal{N}_\infty^\#$: infinite subsets of $\mathbb{N}$
g-lim: graphical limits
p-lim: pointwise limits
e-lim: epigraphical limits
h-lim: hypographical limits
$\lim^\infty$, $\liminf^\infty$, $\limsup^\infty$: horizon limits
$\xrightarrow{\mathrm{p}}$: pointwise convergence
$\xrightarrow{\mathrm{e}}$: epigraphical convergence
$\xrightarrow{\mathrm{h}}$: hypographical convergence
$\xrightarrow{\mathrm{c}}$: cosmic convergence
$\xrightarrow{\mathrm{t}}$: total convergence
$\xrightarrow{\mathrm{g}}$: graphical convergence
$\xrightarrow{C}$: convergence within C
$\xrightarrow{f}$: f-attentive convergence
$\xrightarrow{N}$: convergence indexed by N
sets, cl-sets: spaces of sets
fcns, lsc-fcns: spaces of functions
maps, osc-maps: spaces of mappings
$\hat{\mathbb{d}}_\rho$: estimates of set and epi-distances
$\mathbb{d}$, $\mathbb{d}_\rho$: set distances, epi-distances

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