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# Glossary of Symbols

$\mathcal{H}$	Hilbert space
$\langle x, y \rangle$	Inner product of $x, y \in \mathcal{H}$
$\ x\ $	Norm of $x \in \mathcal{H}$ induced by $\langle \cdot, \cdot \rangle$
$\langle x, y \rangle_G$	Inner product of $x, y \in \mathbb{R}^n$ induced by a positive definite matrix $G$
$\ x\ _G := \sqrt{\langle x, x \rangle_G}$	The norm of $x \in \mathbb{R}^n$ induced by $\langle \cdot, \cdot \rangle_G$
$\angle(x, y)$	Angle between nonzero vectors $x, y \in \mathcal{H}$
$X$	A nonempty closed convex subset of $\mathcal{H}$
$I := \{1, 2, \dots, m\}$	Finite subset of indices
$x_+, x_-$	Positive and the negative part of $x \in \mathbb{R}^n$
$\mathbb{R}_+, \mathbb{R}^-$	Nonnegative and the nonpositive orthant
$\Delta_m$	Standard simplex in $\mathbb{R}^m$
$ J $	The number of elements of a finite subset $J$
$V^\perp$	Subspace orthogonal to a subspace $V \subseteq \mathcal{H}$
$B(x, \rho)$	Ball with a centre $x$ and radius $\rho > 0$
$C'$	Complement of a subset $C \subseteq \mathcal{H}$
$\text{bd } C$	Boundary of a subset $C \subseteq \mathcal{H}$
$\text{int } C$	Interior of a subset $C \subseteq \mathcal{H}$
$\text{cl } C$	Closure of a subset $C \subseteq \mathcal{H}$
$\text{Lin } S$	Linear subspace generated by $S \subseteq \mathcal{H}$
$\text{aff } S$	Affine subspace generated by $S \subseteq \mathcal{H}$
$H(a, \beta)$	Hyperplane $\{x \in \mathcal{H} : \langle a, x \rangle = \beta\}$
$H_-(a, \beta)$	Half-space $\{x \in \mathcal{H} : \langle a, x \rangle \leq \beta\}$
$H_+(a, \beta)$	Half-space $\{x \in \mathcal{H} : \langle a, x \rangle \geq \beta\}$
$f_+, f_-$	Positive and the negative part of a function $f$
$\text{Argmin}_{x \in X} f(x)$	Subset of minimizers of $f : X \rightarrow \mathbb{R}$
$\text{argmin}_{x \in X} f(x)$	Minimizer of $f : X \rightarrow \mathbb{R}$

$S(f, \alpha)$	Sublevel set of a function $f$ at a level $\alpha \in \mathbb{R}$
$\text{epi } f$	Epigraph of a function $f$
$f'(x, s)$	Directional derivative of a function $f$ at $x$ in a direction $s$
$Df, f', DT$	Derivative of a function $f$ or of an operator $T$
$\nabla f(x)$	Gradient of a function $f$ at $x$
$\nabla^2 f(x)$	Hessian of a function $f$ at $x$
$\text{diag } v$	Diagonal matrix with a vector $v$ at the main diagonal
$A^\top$	Matrix transposed to a matrix $A$
$A^+$	Moore–Penrose pseudoinverse of a matrix $A$
$\text{cone } S$	Conical hull of a subset $S \subseteq \mathcal{H}$
$\text{conv } S$	Convex hull of a subset $S \subseteq \mathcal{H}$
$\text{ri } C$	Relative interior of a subset $C \subseteq \mathcal{H}$
$C^*$	Polar cone to $C \subseteq \mathcal{H}$
$N_C(x)$	Normal cone to a convex subset $C \subseteq \mathcal{H}$ at $x \in \mathcal{H}$
$T_C(x)$	Tangent cone to a convex subset $C \subseteq \mathcal{H}$ at $x \in \mathcal{H}$
$\partial f(x)$	Subdifferential of a function $f$ at $x \in \mathcal{H}$
$g_f(x)$	Subgradient of a function $f$ at $x \in \mathcal{H}$
$P_C$	Metric projection onto a subset $C \subseteq \mathcal{H}$
$P_a$	Metric projection onto $\text{Lin}\{a\}$ , where $a \in \mathcal{H}$
$T_\lambda$	Relaxation of an operator $T$
$\text{Fix } T$	Subset of fixed points of an operator $T$
$d(\cdot, C)$	Distance function to a subset $C \subseteq \mathcal{H}$
$d(A, B)$	Distance between subsets $A, B \subseteq \mathcal{H}$
$L(\mathcal{H}_1, \mathcal{H}_2)$	Space of all bounded linear operators $A : \mathcal{H}_1 \rightarrow \mathcal{H}_2$
$\lambda_{\max}(A)$	Largest eigenvalue of a nonnegative operator $A : \mathcal{H} \rightarrow \mathcal{H}$
$\text{Fej } T$	See page 46
$\text{Sep } T$	See page 55

# Glossary of Acronyms

AAR	Averaged alternating reflection	161
APM	Alternating projection method	204
AR	Asymptotically regular (operator)	111
ART	Algebraic reconstruction technique	220
AV	Averaged (operator)	74
CFPP	Common fixed point problem	27
CFP	Convex feasibility problem	27
CMP	Convex minimization problem	25
DR	Douglas–Rachford (algorithm)	212
EMOPP	Extrapolated method of parallel projections	257
EMOPSP	Extrapolated method of parallel subgradient projections	257
EPPM	Extrapolated parallel projection method	257
ESC	Extrapolated simultaneous cutter	188
ESCM	Extrapolated simultaneous cutter method	254
ESSPM	Extrapolated simultaneous subgradient projection method	258
FM	Fejér monotone (operator)	45
FNE	Firmly nonexpansive (operator)	65
$\nu$ -FNE	$\nu$ -firmly nonexpansive (operator)	73
GCFP	Generalized convex feasibility problem	33
KKT-point	Karush–Kuhn–Tucker point	25
LFP	Linear feasibility problem	30
LLSP	Linear least square problem	32
LM	Landweber method	228
LSFP	Linear split feasibility problem	35
NE	Nonexpansive (operator)	41
OCS	Obtuse cone selection	197

PLM	Projected Landweber method .....	228
QNE	Quasi-nonexpansive (operator) .....	47
RFNE	Relaxed firmly nonexpansive (operator) .....	65
$\lambda$ -RFNE	$\lambda$ -relaxed firmly nonexpansive (operator) .....	65
ROCS	Regular obtuse cone selection .....	197
RS	Residual selection .....	197
SCM	Surrogate constraints method .....	263
SiCM	Simultaneous cutter method .....	231
SFM	Strongly Fejér monotone (operator) .....	108
SFP	Split feasibility problem .....	34
SNE	Strongly nonexpansive (operator) .....	91
SPM	Simultaneous projection method .....	215
sQNE	Strictly quasi-nonexpansive (operator) .....	47
$C$ -sQNE	$C$ -strictly quasi-nonexpansive (operator) .....	47
SQNE	Strongly quasi-nonexpansive (operator) .....	56
$\alpha$ -SQNE	$\alpha$ -strongly quasi nonexpansive (operator) .....	56
VIP	Variational inequality problem .....	27

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