Glossary

L : The lower left corner of F_δ, 28

R : The upper right corner of F_δ, 28

$||z||_{L_\mathrm{B}}$: The L_B-norm of z, $||z||_{L_\mathrm{B}} := \mathsf{min}\{c \geq 0 \mid z \in c \cdot \mathrm{B}\}$, 61

$A(k,n)$: $A(k,1) = 2$ for $k = 1$, $A(k,n) = A(k-1, A(k,n-1))$ for $k \geq 2$, 46

$\mathcal{A}_2$: The set of affine transformations of the plane, 41

$\alpha(n)$: $\mathsf{min}\{k \geq 1 \mid A(k,k) \geq n\}$, 46

atomic polynomial expression : Expression of the form $P(\mathrm{x}) \leq 0$, where $P \in \mathbb{R}[x_1, \ldots, x_d]$, 8

$\mathbf{B}$: A centrally symmetric convex body, 63

$\mathbf{B_2}$: The three-dimensional unit ball, 63

$\mathbf{B}_P$: A centrally symmetric convex polyhedron, 63

$\mathsf{bd}_\delta^\mathrm{B}(Q)$: The boundary of the L_B-δ-neighborhood of Q, i.e., the set of all x such that $\mathrm{d}_{L_\mathrm{B}}(x, Q) = \delta$, 63

$\delta(P)$: The detour of P; $\delta(P) = \mathsf{max}_{x \in X, y \in Y, x \neq y} \delta_P(x,y)$, 49

$\delta_P(X,Y)$: The P-detour between X and Y; $\delta_P(X,Y) = \mathsf{max}_{x \in X, y \in Y, x \neq y} \delta_P(x,y)$, 49

$\delta_P(x,y)$: The P-detour between x and y; $\delta_P(x,y) = \mathrm{d}_P(x,y)/||x-y||$, 49

$\mathrm{d}_{L_\mathrm{B}}(x,y)$: The L_B-distance between x and y, $\mathrm{d}_{L_\mathrm{B}}(x,y) := ||x-y||_{L_\mathrm{B}}$, 61

$\mathrm{d}_P(x,y)$: The arclength of the piece of the curve P between x and y, 43

$\mathrm{d}_{\mathsf{discr}}$: The discrete metric, i.e., $\mathrm{d}_{\mathsf{discr}}(P,Q) = 0$ if $P = Q$ and $\mathrm{d}_{\mathsf{discr}}(P,Q) = 1$ otherwise, 7

δ_F-path : A bi-monotone curve within $F_\delta(P,Q)$ from L to R, 28

$\delta_F(P,Q)$: The Fréchet distance between P and Q, 23

$\delta_H(P,Q)$: The Hausdorff distance between P and Q, 7

$\delta_H^{\mathrm{B}}(P,Q)$: The L_{B}-Hausdorff distance between P and Q, 61

$\mathsf{nh}_\delta(Q)$: The δ-neighborhood of Q, i.e., the set of all x such that $\mathrm{d}(x,Q) \leq \delta$, 19

$\tilde{\delta}_H(P,Q)$: The one-sided Hausdorff distance from P to Q, 7

$\tilde{\delta}_H^{\mathrm{B}}(P,Q)$: The one-sided L_{B}-Hausdorff distance from P to Q, 61

$\tilde{\delta}_F$-path : A curve within $F_\delta(P,Q)$ from L to R, 28

$\tilde{\delta}_F(P,Q)$: The weak Fréchet distance between P and Q, 23

Davenport-Schinzel sequence: A sequence $U = \langle u_1, \ldots, u_m \rangle$ over $\{1,\ldots,n\}$ such that any two consecutive elements of U are distinct, and U does not contain a subsequence of length $s+2$ of the form $ababab\ldots$ for $a \neq b$, 48

Δ-pattern: A finite set of triangles with the property, that any two distinct triangles in the set do not intersect in their relative interiors, 61

description complexity (of a semialgebraic set): This accounts for the number and the maximum degree of the polynomials in a polynomial expression defining the set, 8

$F_\delta(P,Q)$: The free space of P and Q, 28

$\mathcal{K}^1$: The set of all closed plane curves, 23

κ-straight curve: A curve P s.th. $\mathsf{max}_{x \neq y}\, \mathrm{d}_P(x,y)/||x-y|| \leq \kappa$, 43

$\mathcal{K}^0$: The set of all plane curves, 23

$\lambda_s(n)$: The maximum length of a Davenport-Schinzel sequence of order s over an n-element alphabet, 48

$\mathsf{nh}_\delta^{\mathrm{B}}(Q)$: The L_{B}-δ-neighborhood of Q, i.e., the set of all x such that $\mathrm{d}_{L_{\mathrm{B}}}(x,Q) \leq \delta$, 63

$\mathcal{O}_\epsilon(f(n,\epsilon))$: The set of all functions $T(n)$ such that there is a function $C(\epsilon)$, and for any $\epsilon > 0$ and for all n, $T(n) \leq C(\epsilon) \cdot f(n,\epsilon)$ holds, 2

p_δ : The circle with center p and radius δ, 32

polynomial expression : Any finite boolean combination of atomic polynomial expressions, 8

$\mathcal{R}(\mathcal{K},\delta,\mathcal{T})$: The set of δ–reference points for $\mathcal{K}$ with respect to $\mathcal{T}$, 40

$\boldsymbol{\mathcal{R}(\mathcal{K}, \delta, c, \mathcal{T})}$: The set of $\boldsymbol{\delta}$–reference points for $\boldsymbol{\mathcal{K}}$ of quality $\boldsymbol{c}$ with respect to $\boldsymbol{\mathcal{T}}$, 38

semialgebraic set: a set satisfying a polynomial expression, 8

$\boldsymbol{\mathcal{T}^{\delta}_{crit}(c)}$: The set of all translations that are $\boldsymbol{\delta}$-critical for $\boldsymbol{c}$, 33

$\boldsymbol{\mathcal{T}_2}$: The set of planar translations, 28

$\boldsymbol{{\mathcal{T}'_{crit}}^{\delta}(c)}$: The set of all translations that are $\boldsymbol{\delta}$-supercritical for $\boldsymbol{c}$, 36

Tarski sentence : A polynomial expression prefixed by a finite number of $\exists$ and $\forall$ quantifiers, 18