List of notation

- $:=$ – equals by definition
- $\delta(s,t)$ – Kronecker delta, equal to 1 when $s = t$, and 0 otherwise
- $\binom{n}{m}$ – binomial coefficient, equal to $\frac{n!}{m!(n-m)!}$
- $\mathbb{R}$ – real numbers

Sets and families
- $[m]$ – set of consecutive integers $\{1, 2, \ldots, m\}$
- $\binom{U}{2}$ – family of unordered 2-subsets of a set U
- $A \dot\cup B$ – disjoint union of sets or families A and B
- $A \times B$ – Cartesian product of sets A and B
- $\mathrm{V}(\mathcal{A})$ – ground set $\bigcup_{i=1}^{\alpha} A_i$ of a family $\mathcal{A} := \{A_1, \ldots, A_\alpha\}$
- $|A|$ – cardinality (number of elements) of a set A
- $\#\mathcal{A}$ – number of sets in a family $\mathcal{A}$
- $\mathfrak{B}(\mathcal{A})$ – blocker of a family $\mathcal{A}$
- $\mathbf{2}^V$ – power set of a set V
- $A^\perp$ – complement, $\mathrm{V}(\mathcal{A}) - A$, of a set A from a family $\mathcal{A}$
- $\mathcal{A}^\perp$ – family of complements $\{A^\perp : A \in \mathcal{A}\}$

Topological spaces
- $\mathrm{Fr}(\cdot)$ – boundary of a subset of a topological space

Partially ordered sets (*posets*)
- $a \preceq b$ – elements a and b are comparable in a poset
- $\hat{0}$ and $\hat{1}$ – least and greatest elements of a lattice, respectively
- $\mathbb{B}(m)$ – Boolean lattice of rank m
- $\mathbb{B}(m)^{(1)}$ – atom set of the Boolean lattice $\mathbb{B}(m)$
- $\rho(\cdot)$ – rank function of a poset
- $\mathbf{min}\,\mathcal{V}$ and $\mathbf{max}\,\mathcal{V}$ – sets of minimal and maximal elements of a poset $\mathcal{V}$, respectively
- $\mathfrak{I}(\mathcal{V})$ and $\mathfrak{F}(\mathcal{V})$ – order ideal and order filter generated by a set $\mathcal{V}$, respectively

Maps
- $f: A \to B$, $a \mapsto b$ – map f from a set A to a set B; the image of an element $a \in A$ is an element $b := f(a) \in B$
- $f|_A : A \to C$, $a \mapsto f(a)$ – restriction of a map $f: B \to C$ to a subset $A \subseteq B$

Complexes and graphs
- Δ – abstract simplicial complex
- $\mathbf{max}\,\Delta$ – facet family of a complex Δ

DOI 10.1515/9783110481068-008,

- $\Delta(\mathcal{A})$ – complex with facet family $\mathcal{A}$
- (V, Δ) – complex on vertex set V
- $(V, \Delta) \simeq (V', \Delta')$ – complexes (V, Δ) and (V', Δ') are isomorphic
- $\Delta^{\vee}$ – Alexander dual of a complex Δ
- $\dim F$ – dimension of a face F of a complex
- $\dim \Delta$ – dimension of a complex Δ
- $f_j(\Delta)$ – number of j-dimensional faces of a complex Δ
- $(V, \mathcal{E})$ – simple graph with vertex set V and edge set $\mathcal{E}$, or the hypergraph with vertex set V and hyperedge family $\mathcal{E}$
- $\mathcal{N}(v)$ – neighborhood of a vertex v in a graph
- $\mathtt{ISG}(V, \Delta)$ and $\overrightarrow{\mathtt{ISG}}(V, \Delta)$ – undirected and oriented graphs of an independence system associated with a complex (V, Δ), respectively
- $\mathtt{MFSG}(\mathfrak{S})$ – graph of maximal feasible subsystems (the graph of MFSs) of an infeasible system of linear inequalities $\mathfrak{S}$

Vectors
- $\langle \boldsymbol{a}, \boldsymbol{b} \rangle$ – standard scalar product $\sum_{1 \le k \le n} a_k b_k$ of n-dimensional real vectors $\boldsymbol{a}$ and $\boldsymbol{b}$
- $\|\boldsymbol{a}\| := \sqrt{\langle \boldsymbol{a}, \boldsymbol{a} \rangle}$ – Euclidean norm of a real vector $\boldsymbol{a}$

Systems of constraints
- $\boldsymbol{A}(\mathfrak{S})$ – set of vectors $\{\boldsymbol{a}_i : i \in [m]\}$ that determine the system $\mathfrak{S} := \{\langle \boldsymbol{a}_i, \mathbf{x} \rangle > 0 : \boldsymbol{a}_i, \mathbf{x} \in \mathbb{R}^n;\ \|\boldsymbol{a}_i\| = 1\}$
- $\mathbf{J}$ and $\mathbf{I}$ – family of the multi-indices of maximal feasible subsystems (MFSs) and the family of the multi-indices of minimal (irreducible) infeasible subsystems (IISs), respectively
- ν_k and τ_k – number of feasible subsystems and the number of infeasible subsystems, of cardinality k, respectively

Boolean functions
- $\mathbf{B}$ – set $\{0, 1\}$
- $\mathbf{B}^m$ – unit discrete m-cube
- $\mathrm{supp}(\boldsymbol{x})$ – set $\{i \in [m] : x_i = 1\}$ corresponding to a tuple $\boldsymbol{x} \in \mathbf{B}^m$
- $|\boldsymbol{\alpha}|$ – number of units in a tuple $\boldsymbol{\alpha} \in \mathbf{B}^m$
- $\boldsymbol{\alpha} \oplus \boldsymbol{\beta}$ – coordinate-wise summation of tuples $\boldsymbol{\alpha}, \boldsymbol{\beta} \in \mathbb{F}_2^m$ of length m over the field $\mathbb{F}_2$ with two elements that compose the set $\mathbf{B}$
- $\mathcal{M}_m$ – class of all monotone Boolean functions (MBFs) of m variables
- $\mathfrak{f}^{-1}(0)$ and $\mathfrak{f}^{-1}(1)$ – set of zeros and the set of units of a monotone Boolean function $\mathfrak{f}$, respectively
- $\mathfrak{Q}(\mathfrak{f}) := \mathbf{max}\, \mathfrak{f}^{-1}(0)$ and $\mathfrak{P}(\mathfrak{f}) := \mathbf{min}\, \mathfrak{f}^{-1}(1)$ – set of upper zeros and the set of lower units of a monotone Boolean function $\mathfrak{f}$, respectively

- $\mathcal{O}_{\mathfrak{f}}$ – operator that calculates, for a tuple from $\mathbf{B}^m$, the corresponding value of a monotone Boolean function $\mathfrak{f}$
- $\varphi(G, \mathfrak{f})$ – number of invocations, by an algorithm G, of the operator $\mathcal{O}_{\mathfrak{f}}$ when inferring a MBF $\mathfrak{f} \in \mathcal{M}_m$

Subspaces, hulls and convex sets

- $\operatorname{conv}(\boldsymbol{X})$ – convex hull of a set $\boldsymbol{X} \subset \mathbb{R}^n$
- $\operatorname{lin}(\boldsymbol{X})$ – linear hull of a set $\boldsymbol{X} \subset \mathbb{R}^n$
- $\mathbf{H}(T)$ – linear subspace $\bigcap_{t \in T}\{\boldsymbol{x} \in \mathbb{R}^n : \langle \boldsymbol{a}_t, \boldsymbol{x} \rangle = 0\}$
- $\mathbf{C}_>(T)$ – open cone $\bigcap_{t \in T}\{\boldsymbol{x} \in \mathbb{R}^n : \langle \boldsymbol{a}_t, \boldsymbol{x} \rangle > 0\}$
- $\mathbf{C}_<(T) := -\mathbf{C}_>(T)$
- $\overline{\mathbf{C}_>(T)}$ – closed cone $\bigcap_{t \in T}\{\boldsymbol{x} \in \mathbb{R}^n : \langle \boldsymbol{a}_t, \boldsymbol{x} \rangle \geq 0\}$
- $\mathcal{F}(L, T)$ – open, with respect to a subspace $\mathbf{H}(L)$, face $\mathbf{H}(L) \cap \mathbf{C}_>(T - L)$ of a closed cone $\overline{\mathbf{C}_>(T)}$
- $[\boldsymbol{x}, \boldsymbol{y}] := \operatorname{conv}\{\boldsymbol{x}, \boldsymbol{y}\}$ – closed segment between points $\boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^n$
- $(\boldsymbol{x}, \boldsymbol{y})$ – open segment $[\boldsymbol{x}, \boldsymbol{y}] - \{\boldsymbol{x}, \boldsymbol{y}\}$