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Filename	Appendix A Abbreviations, notations and conventions

SOURCE (OR PART OF THE FOLLOWING SOURCE):

Type	Dissertation
Title	Solving large structured Markov Decision Problems for perishable inventory management and traffic control
Author	R. Haijema
Faculty	Faculty of Economics and Business
Year	2008
Pages	xiv, 357
ISBN	9789036101011

FULL BIBLIOGRAPHIC DETAILS:
http://dare.uva.nl/record/292130

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Appendix A

Abbreviations, notations and conventions

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Throughout this thesis the following conventions and notations apply. At a few places notations may differ, e.g. for typographical reasons or to stay consistent with notations that are common in the literature.

$\mathbf{x}$	vectors are printed in bold face small case letters.
$\mathbf{A}$	matrices are in bold capital letters.
A_{ij}, x_i	elements of matrices and vectors are printed as scalar variables in italic case, with indexes in subscript.
$x = \sum_i x_i$	the sum of all elements in vector $\mathbf{x}$ is denoted by the scalar x.
$\mathbf{1}$	a vector of elements equal to 1.
$\mathbf{e}_i$	the i-th unit vector: all elements are zero, but the i-th element equals 1.
$\mathcal{X}$	sets are printed using calligraphic letters.
$\lvert\mathcal{X}\rvert$	denotes the number of elements in set $\mathcal{X}$.
$\bigcup_{i=1}^{m} \mathcal{X}_i$	the union of the m sets $\mathcal{X}_1, \ldots, \mathcal{X}_m$. $= \{x \mid x \in \mathcal{X}_1 \vee x \in \mathcal{X}_2 \vee \ldots \vee x \in \mathcal{X}_m\}$
$\prod_{i=1}^{m} \mathcal{X}_i$	the multi-dimensional state space by combining the m sets $\mathcal{X}_1, \ldots, \mathcal{X}_m$. $= \{\mathbf{x} = (x_1, x_2, \ldots, x_m) \mid \forall i \in \{1, 2, \ldots, m\} : x_i \in \mathcal{X}_i\}$.
$\mathcal{X}(x_1 = a)$	denotes the subspace of $\mathcal{X}$, where x_1 takes value a.

$I(q)$ $= \begin{cases} 1 & \text{if } q = \text{true}, \\ 0 & \text{if } q = \text{false}. \end{cases}$

e.g. $I(a > 0)$ is 1 if $a > 0$ and 0 if $a \leq 0$

a^+ the positive part of a: a^+ is a when $a > 0$ and 0 otherwise.

$|a|$ the absolute value of a.

$\lfloor a \rfloor$ the floored value of a (round down).

$\lceil a \rceil$ the ceiled value of a (round up).

When the value of a is limited from above and below, the bounds are denoted by:

$\overline{a}$ or A the upper bound set to a: depending on the context, the upper bound of a parameter or variable is denoted in uppercase or the over-line-notation is used.

$\underline{a}$ the lower bound set to a.

Variables are denoted by a single letter to keep notations clear and short. To improve the readability of the models, the letter relates to the definition of the variable. Variable names thus depend on the context, but in case of conflicting or confusing notations other names are chosen.