Mahout Manual Book

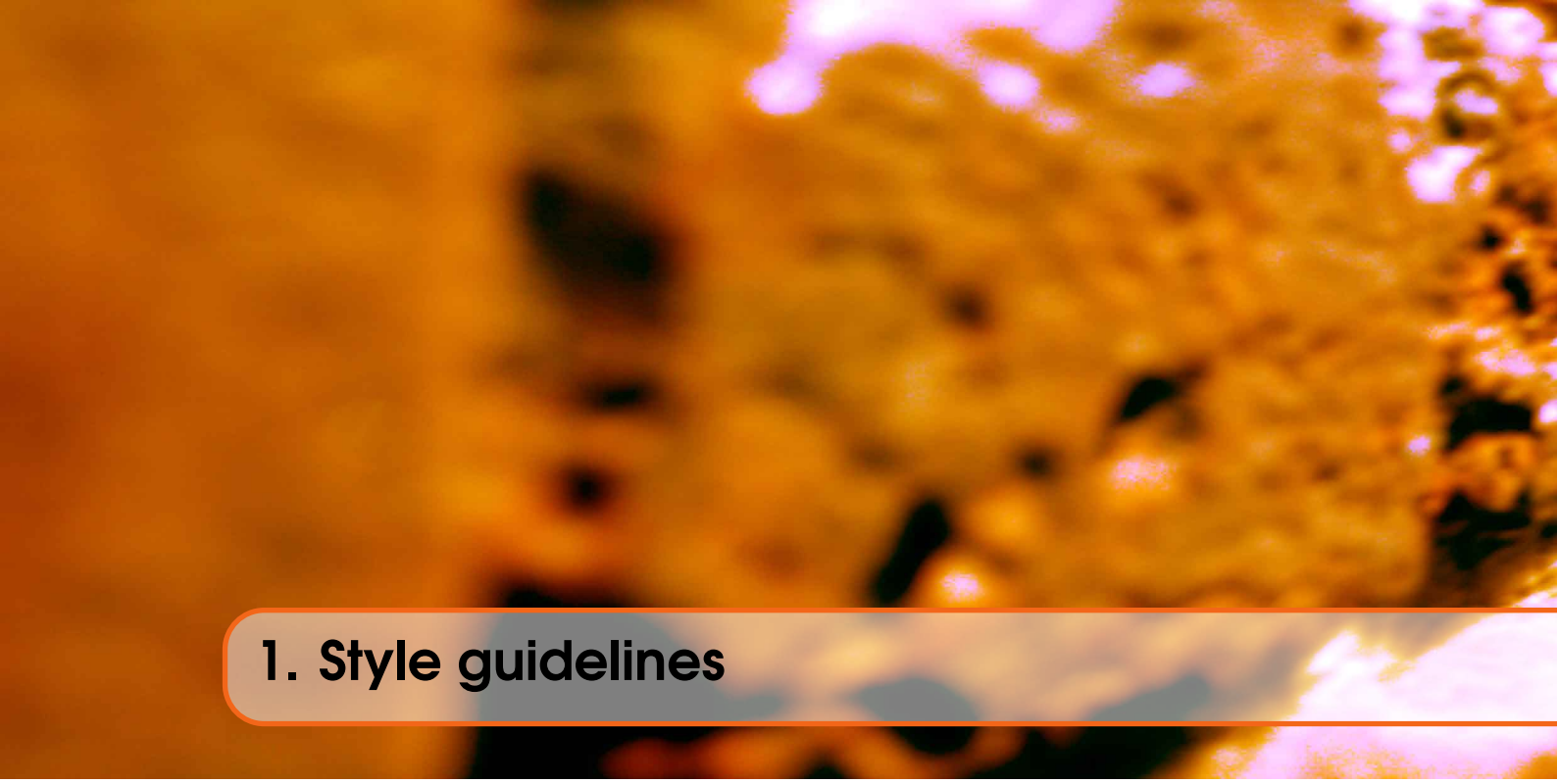
Samsara

TODO

MAHOUT.APACHE.ORG

Mahout version: 0.10.0

Contents



1. Style guidelines

1.1 Introduction

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Explain with formula:

$$\mathbf{m}^{(y+1)} = \frac{\sum_{i=1}^{n} \kappa\left(\boldsymbol{x}_i, \mathbf{m}^{(y)}, h\right)^{\beta} \boldsymbol{x}_i}{\sum_{i=1}^{n} \kappa\left(x_i, \mathbf{m}^{(y)}, h\right)^{\beta}} \tag{1.1}$$

follow up with a code example:

■ **Example 1.1 Hello, world**: use "LyX code" style for the code itself:

```
object HelloWorld {
   def main(args: Array[String]) {
     println("Hello, world!")
   }
 }
```

Note that `\boldsymbol` instruction doesn't work in formulas for latin italic symbols (apparently,

this font doesn't provide it). To fall back to AMS bold symbols, use \bm. E.g.

$$\boldsymbol{x} = \begin{pmatrix} x_1 \\ x_2 \\ \vdots \\ x_k \end{pmatrix},$$

which is

■ **Example 1.2 Latex with \bm:**

```
\[
\bm{x}_{i}=\left(\begin{matrix}x_{1}\\
x_{2}\\
\vdots\\
x_{k}
\end{matrix}\right)
\]
```

Math is activated by alt-M M. Formula number is added by alt-M N.

LyX code style is activated by Alt-P,C.

To enter tex directly, like \begin{code} command, use ctrl-L.

If you need `embedded code` symbols, use ctrl-shft-P. Embedded code symbols will not split for carry-over automatically, needs \- hyphens in order to show where carryover may occur, e.g. `reallylongcodewordthatneedstobecarriedreallylongcodewordthatneedstobecarriedreallylongcodewordthatneedstobecarried`.

Section symbol §: ctrl-L, \S.

1.2 Math notation conventions.

$\boldsymbol{x}$, $\boldsymbol{\mu}$: vectors are in bold. for Latin characters both $\boldsymbol{x}$ (\bm) and $\mathbf{x}$ (ctrl-B) typesets are admissible. For Greek characters, use \bm: $\boldsymbol{\xi}$.

x_i, μ_i: vector elements (regular, italic math font). Note the difference: $\mathbf{x}_i$ or $\boldsymbol{x}_i$ means "i-th vector in a set", whereas x_i means "i-th element of vector $\boldsymbol{x}$.

$\mathbf{X}$, $\boldsymbol{\Xi}$: matrices are in bold, capital letters (ctrl-B). Either Greek or Latin is admissible (but usually there's no compelling reason ot switch to Greek if Latin are enough).

$\operatorname{argmin}_y f(y)$: predefined function names are in \mathrm (math roman). don't use italics for predefined function names.

$\mathbf{X} \in \mathbb{R}^{m \times n}$: Matrix of $m \times n$ geometry. LaTeX: `\mathbf{X}\in\mathbb{R}^{m\times n}`

$\mathbf{x}^\top\mathbf{x}$: this notation of dot-product is preferred over $\langle \mathbf{x}, \mathbf{x} \rangle$ notation (seems to be in more recent books and papers). Outer product, respectively, is $\mathbf{x}\mathbf{x}^\top$.

$\mathbf{X}^\top$: transposition symbol, use \top, not $\mathbf{X}'$ $\mathbf{X}^*$ please.

$\mathbf{X}_{i*}$ row of $\mathbf{X}$

$\mathbf{X}_{*j}$ column of $\mathbf{X}$

$\mathbf{X}_{i,j}$ **or** $\mathbf{X}_{ij}$ Absent of any other clarification, this is always a i-row, j-column element of $\mathbf{X}$. Could be block sometimes, in which case it should be explicitly given in the context of discussion by introducing something like $\mathbf{A} = \begin{pmatrix} \mathbf{A}_{1,1} & \cdots & \mathbf{A}_{1,n} \\ \vdots & \ddots & \vdots \\ \mathbf{A}_{m,1} & \cdots & \mathbf{A}_{m,n} \end{pmatrix}$.

$\mathbf{X}_i$ despite what quite a bit of people often imply, this is in fact not a row or column of $\mathbf{X}$, but rather i-th vertical or horizontal block of matrix $\mathbf{X}$. Again, which one, should be given by definition similar to above.

$\mathbf{x}_i \triangleq \mathbf{X}_{i*}$ means '$\mathbf{x}_i$ is defined as row of matrix $\mathbf{X}$ where i goes between 1 and m'.

$\mathscr{S}$, $\mathscr{P}$ for sets, use \mathcal typeset, capital latin letters. (a bit screwed in this template IMO).

$\forall, \exists$ 'forall', 'exists'... etc.