# ERRATA:
# Foundations of Statistical Algorithms

Claus Weihs, Olaf Mersmann & Uwe Ligges
Department of Statistics
TU Dortmund University, Germany

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# Notation

Unfortunately, some errors have been found already.

Here we will explain which parts contain errors (marked "←") and are to be replaced by parts marked "→".

Text to be removed is printed in red, new text in blue color.

# 1 Introduction

# 2 Computation

**Page 25, Algorithm 2.2** (Thanks to Daniel Horn)

← 8: $j \leftarrow \lceil (l+r)/2 \rceil$

→ 8: $j \leftarrow \lfloor (l+r)/2 \rfloor$

**Page 72, Lines 5–7 of Section 2.4.4.2**

← This condition number $\kappa$ measures the sensitivity of $S$ for a given data set, i.e. if relative errors $\delta$ exist in $x_i$, then the relative error in $S$ is bounded by $\kappa\delta$.

→ This condition number $\kappa$ measures the sensitivity of $S$ for a given data set, i.e. if relative errors $\delta$ exist in $x_i$, then the relative error in $S$ is bounded by $f(\kappa)\delta$, where $f(\kappa)$ is a function of $\kappa$.

# 3 Verification

# 4 Iteration

**Page 141, Item 3 of Proposition 4.3**

← – If $S(\boldsymbol{\beta}) = (\boldsymbol{y} - \boldsymbol{X}\boldsymbol{\beta})^T(\boldsymbol{y} - \boldsymbol{X}\boldsymbol{\beta})$, then $\nabla S(\boldsymbol{\beta}) = -2\boldsymbol{y}^T\boldsymbol{X} + 2\boldsymbol{X}^T\boldsymbol{X}\boldsymbol{\beta}$. By setting this to zero, we get the **Normal equations** (see Section 3.1.2): $\boldsymbol{X}^T\boldsymbol{X}\boldsymbol{\beta} = \boldsymbol{y}^T\boldsymbol{X}$

→ – If $S(\boldsymbol{\beta}) = (\boldsymbol{y} - \boldsymbol{X}\boldsymbol{\beta})^T(\boldsymbol{y} - \boldsymbol{X}\boldsymbol{\beta})$, then $\nabla S(\boldsymbol{\beta}) = -2\boldsymbol{X}^T\boldsymbol{y} + 2\boldsymbol{X}^T\boldsymbol{X}\boldsymbol{\beta}$. By setting this to zero, we get the **Normal equations** (see Section 3.1.2): $\boldsymbol{X}^T\boldsymbol{X}\boldsymbol{\beta} = \boldsymbol{X}^T\boldsymbol{y}$.

**Page 230, Formula** (Thanks to Christian Robert)

←
$$\exp\left(-\frac{t}{\Delta}\right) > u,$$

→
$$\exp\left(-\frac{\Delta}{t}\right) > u,$$

**Page 231, Algorithm 4.12** (Thanks to Christian Robert)

← 6: **if** $\exp(-\frac{t}{\Delta}) > u$ **then**

→ 6: **if** $\exp(-\frac{\Delta}{t}) > u$ **then**

# 5 Deduction of Theoretical Properties

# 6 Randomization

# 7 Repetition

# 8 Scalability and Parallelization