Corrections for "3d Images of Materials Structures – Processing and Analysis"

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Chapter 3, Section 3.3.3, page 52, Fig. 3.4 and page 53, lines 1-2:

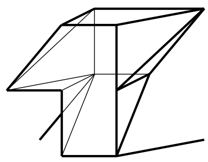

Figure 3.4c: the discretization $X \sqcap \mathbb{F}_{14.1}$

Analogously, for the set in Figure 3.4c we get $\#\mathcal{F}^0(X \sqcap \mathbb{F}_{14.1}) = 13$, $\#\mathcal{F}^1(X \sqcap \mathbb{F}_{14.1}) = 22$, $\#\mathcal{F}^2(X \sqcap \mathbb{F}_{14.1}) = 11$, $\#\mathcal{F}^3(X \sqcap \mathbb{F}_{14.1}) = 1$, and thus $\chi(X \sqcap \mathbb{F}_{14.1}) = 1$.

Chapter 3, Section 3.4.1, page 63, Table 3.6:

Figure	volume	$\widehat{\chi_V}$ [mm^{-3}]			
	[mm^3]	$(\mathbb{F}_6, \mathbb{F}_{26})$	$(\mathbb{F}_{14.1}, \mathbb{F}_{14.1})$	$(\mathbb{F}_{14.2}, \mathbb{F}_{14.2})$	$(\mathbb{F}_{26}, \mathbb{F}_6)$
3.6a	63.778	9.7055	8.5766	7.9494	7.1968
3.6b	53.568	-253.771	-263.852	-273.149	-278.338

Chapter 4, Section 4.2.7.2, pages 114-115:

p. 114, l. 21, initialization of d: $d_i = 0$ if $b_i = 1$ and $d_i = \infty$ if $b_i = 0$

Algorithm 5.2.2 (two-pass recurrence):

1. *Initialisation* Initialise $d_i = 0$ if $b_i = 1$ and $d_i = \infty$ if $b_i = 0$ for $i = 0, \ldots, m-1$. Set $d' = 0$ $\kappa = 0$.

2. *Forward scan* for $\ell = 0, \ldots, m-1$ do
   if $d_\ell = 0$ then $d' = 0$ and $\kappa = \ell$,
   if $d' + (\kappa - \ell)^2 < d_\ell$ then $d_\ell = d' + (\kappa - \ell)^2$.

3. *Backward scan* $\kappa = m-1$, for $\ell = m-1, \ldots, 0$ do
   if $d_\ell = 0$ then $d' = 0$ and $\kappa = \ell$,
   if $d' + (\kappa - \ell)^2 < d_\ell$ then $d_\ell = d' + (\kappa - \ell)^2$.

Algorithm 5.2.3 (3D):

1. *Initialisation* Initialise $d_{ijk} = \infty$ for $i, j, k = 0, \ldots, m-1$.

2. *x-direction* For $j, k = 0, \ldots, m-1$ update the distances in each column in x-direction as $d_{ijk} = \min_\ell\{(i-\ell)^2 : \ b_{ljk} = 1, 0 \le \ell < m\}$ for all $i = 0, \ldots, m-1$.

3. *y-direction* For $i, k = 0, \ldots, m-1$ update the distances in each column in y-direction as $d_{ijk} = \min_\ell\{d_{i\ell k} + (j-\ell)^2 : \ 0 \le \ell < m\}$ for all $j = 0, \ldots, m-1$.

4. *z-direction* For $i, j = 0, \ldots, m-1$ update the distances in each column in z-direction as $d''_{ijk} = \min_\ell\{d_{ij\ell} + (k-\ell)^2 : \ 0 \le \ell < m\}$ for all $k = 0, \ldots, m-1$.

Chapter 7, Section 7.6.2.2, page 261, line -8:

The value 0.124 is not the hard-core radius R_{hc} but the parameter $p_{hc} = \lambda_{hc} c/8$ with $c = 4/3\pi(2R_{hc})^3$ indicating the degree of regularity. It holds that $p_{hc} \le \frac{1}{8}$. Thus the parameter is chosen close to its maximum. The corresponding hard-core radius is $R_{hc} = 0.3102$.

Section	page	line	is	should read
Title		3	Material	Materials
Preface	XIII	-7	, and Björn Wagner	
Chapter 2				
2.1.1	11	-8	$\|x\|_p = \left(x_1^2 + \cdots + x_n^2\right)^{\frac{1}{p}}$	$\|x\|_p = \left(x_1^p + \cdots + x_n^p\right)^{\frac{1}{p}}$
2.1.1	13	15	A set is called topologically closed if $X = \bar{X}$.	
2.1.1	13	-10	there is an	there is an $\varepsilon > 0$ such that
2.1.1	14	-9	*convex ring*, which consists of all finite unions of convex sets	*convex ring*, which consists of all finite unions of convex compact sets
2.1.2	15	6	$\kappa_1(s), \ldots, \kappa_{n-2}(s)$	$\kappa_1(s), \ldots, \kappa_{n-1}(s)$
2.1.2	15	7	$\kappa_1(s), \ldots, \kappa_{n-2}(s)$	$\kappa_1(s), \ldots, \kappa_{n-1}(s)$
2.1.2	15	-2	$\kappa_1(s)$ and $\kappa_1(s)$	$\kappa_1(s)$ and $\kappa_2(s)$
2.1.3	17	7	non-negative real-valued set function	non-negative set function
2.1.3	17	-6, -5	$k > 0$, $\kappa_k \inf_\sigma \sum_i \left(\frac{d_i}{2}\right)^k$	$d > 0$, $\kappa_d \inf_\sigma \sum_i \left(\frac{d_i}{2}\right)^d$
2.2.1	18	-12 to -10	$K_1 \cup K_1$	$K_1 \cup K_2$
2.2.1	19	-9	morphologically closed	morphologically regular
2.2.1	20	6	orthogonal space $^\perp L$ of L	orthogonal space $^\perp L$ of L with respect to $\mathbb{R}^k$, span $(L, ^\perp L) = \mathbb{R}^k$
2.2.1	20	-4	largest distance	smallest distance
2.2.2	21	12, 13	H_{n-2}	H_1
2.2.2	21	-11	κ_{n-2}	κ_2
2.2.4	24	-6	$X \in \mathscr{R}$	$X \in \mathcal{R}$
2.2.4	24	-3	for $k = 0, \ldots, m$	for $k = 0, \ldots, n$
2.2.5	25	-3	$X \oplus (Y + x)$	$X \cap (Y + x)$
2.2.5	26	Eq. (2.16)	for $j = 0, \ldots, n$	for $j = 0, \ldots, k$
2.3.1	27	15	$\{\mathcal{F}^G : G \in \mathcal{G}\}$	$\{\mathcal{F}_G : G \in \mathcal{G}\}$
2.3.2	28	11, -3	Choquet capacity functional of finite order	Choquet capacity functional of **in**finite order
2.3.2	28	-6	on $\mathcal{K}$ with $0 \leq T(K) \leq 1$, $K \in \mathcal{K}$	on $\mathcal{C}$ with $0 \leq T(C) \leq 1$, $C \in \mathcal{C}$
2.3.2	28	-4	$\mathbb{P}_\Xi(\mathcal{F}_K) = T(K)$ for all $K \in \mathcal{K}$	$\mathbb{P}_\Xi(\mathcal{F}_C) = T(C)$ for all $C \in \mathcal{C}$
2.3.2	30	2	[317, p. 482]	[317, p. 428]
2.3.3	31	6	supp$\check{}$	supp Φ
2.3.3	33	Th. 2.4	$\sum_{x \in \mathbb{R}^n} \Phi(\{x\}) f(x)$	$\mathbb{E} \sum_{x \in \mathbb{R}^n} \Phi(\{x\}) f(x)$
2.4.2	37	-7	$\hat{g}(\xi - a)$	$\hat{f}(\xi - a)$

Table 1: Typos, wrong references and symbols, title to Chapter 2.

Section	page	line	is	should read
Chapter 3				
3.2.1	45	2	bcd	bcc
3.2.3	47	16	$\mu + 1 = 22$ congruence classes	$\nu_0 + 1 = 22$ congruence classes
3.3.1	49	-6	$\mathbb{F}_{2n} = \bigcup_{x \in \mathbb{L}^n} \bigcup_{j=0}^{n} \mathcal{F}^j(C + x)$	$\mathbb{F}_{2n} = \bigcup_{x \in \mathbb{L}^n} \bigcup_{j=0}^{n} \mathcal{F}^j(C + x) \cup \{\emptyset\}$
3.3.3	52	10, -11	Euler-Poincaré formula (3.4)	Euler-Poincaré formula (2.4)
Remark 3.2	53	6	$F_{12.1}$ and $F_{12.1}$	$\mathbb{F}_{12.1}$ and $\mathbb{F}_{12.2}$
3.4.1	62	3	$44.6\,\mathrm{mm} \times 44.6\,\mathrm{mm} \times 16.3\,\mathrm{mm}^3$	$44.6\,\mathrm{mm} \times 44.6\,\mathrm{mm} \times 16.3\,\mathrm{mm}$
3.6.2.3	75	24	edges	vertices

Table 2: Typos, wrong references and symbols, Chapter 3.

Section	page	line	is	should read
Chapter 4				
4.1.1	79	(4.1), (4.2)	$\int_{0}^{\infty}$	$\int_{-\infty}^{\infty}$
4.1.1	79	(4.2)	$\frac{1}{2\pi}$	
4.1.1	79	-1	$-2\pi ik\omega$	$2\pi ik\omega$
4.1.3	81	-2, -1	upper summation bounds m_i	upper summation bounds $m_i - 1$
4.2.1.1	84	13	$\{x \in \mathbb{R}^n : X \cap (\check{Y} + x) = \emptyset\}$	$\{x \in \mathbb{R}^n : X \cap (\check{Y} + x) \neq \emptyset\}$
4.2.1.1	84	-12	$(a+b)X = aX \oplus bX$	$(a+b)X = aX \oplus bX$ for convex sets X and $a, b \geq 0$
4.2.1.2	85	12	$X \ominus \{y\} = X - y$	$X \ominus \{y\} = X + y$
4.2.1.2	86	6	just-touched objects	just-touching objects
4.2.1.3	88	13	$\chi(X) = \sum_{i=1}^{m} \chi(X_i) - \sum_{i=1}^{m-1} \sum_{j=1}^{m} \chi(X_i \cap X_j)$	$\chi(X) = \sum_{i=1}^{m} \chi(X_i) - \sum_{i=1}^{m-1} \sum_{j=i+1}^{m} \chi(X_i \cap X_j)$
Table 4.1	91	caption	cube	rhombic dodecahedron
4.2.1.8	92	-10	$X \circ Y \cap \big((W \ominus \check{W}) \ominus W\big)$	$X \circ Y \cap \big((W \ominus \check{Y}) \ominus Y\big)$
Definition 4.6	94	14, 16	$x, y \in \mathbb{C}$, $y \in \mathbb{C}$	$x, y \in \mathbb{R}^n$, $y \in \mathbb{R}^n$
Definition 4.6	94	14	ϕ on $L^1(R^n)$	ϕ on $L^1(\mathbb{R}^n)$
4.2.2	94	5	$f^*(x) = \overline{f'(x)}$	$f^*(x) = \overline{f(-x)}$
4.2.2.2	99	13 and 14	directional gradient	directional derivative
4.2.2.2	101	-9	operator	filter mask
4.2.3	102	7	$\mathbb{1}_{X \oplus Y}(x) = \sup\{\mathbb{1}_X(x+y) : y \in Y\}$	$\mathbb{1}_{X \oplus Y}(x) = \sup\{\mathbb{1}_X(x-y) : y \in Y\}$
4.2.3	102	13	$f^Y(x) = \sup\{f(x+y) : y \in Y\}$	$f^Y(x) = \sup\{f(x-y) : y \in Y\}$
4.2.3	103	4	$f^{\check{Y}}$ and $f^{\check{Y}}$	$f^{\check{Y}}$ and $f_{\check{Y}}$
4.2.4	103	-2	monotone decreasing	monotone increasing
4.2.4	104	1	quantity t_α	quantity $t_{Y\alpha}$
4.2.5	106	-1	$\Vert\nabla f_0\Vert - a^2$	$\Vert\nabla f_0\Vert + a^2$
4.2.5	107	22	covariance function $\Sigma = Dt$	covariance matrix $\Sigma = Dt$
4.2.6.4	111	20	f serving as marker image and $f+h$ as mask image	$f+h$ serving as marker image and f as mask image
Definition 4.9	131	4	$\mathbb{F}$-path from x to y	$\mathbb{F}$-path from x to y in Y
Theorem 4.5	133	-9	Then S separates $\mathbb{R}^n$ into two connected sets, one compact and the other one non-compact.	Then S separates $\mathbb{R}^n$ into two connected sets, one bounded and the other one unbounded.
4.3.2.2	134	1	$(\mathbb{L}^n \setminus Y) \sqcap \mathbb{F}_c$	$(\mathbb{L}^3 \setminus Y) \sqcap \mathbb{F}_c$
4.3.2.2	134	4	surface rendering, see Section 3.5.2	surface rendering, see Section 3.6.2
4.3.2.3	135	14-15	the set $V = Y$ of edges and the set $E = \{F \in \mathcal{F}^1(\mathbb{F}) : \mathcal{F}^0(F)\}$ of vertices	the set $V = Y$ of vertices and the set $E = \{F \in \mathcal{F}^1(\mathbb{F}) : \mathcal{F}^0(F) \subset Y\}$ of edges
4.3.2.3	138ff	i-iii, v	indices ν are missing, e. g. $\text{label}_{3,3} = \text{label}_{1,1-1}$	e. g. $\text{label}_{3,\nu_3} = \text{label}_{1,\nu_1-1}$

Table 3: Typos, wrong references and symbols, Chapter 4.

Section	page	line	is	should read
Chapter 5				
5.2.2	152	-8	$V_{\perp L}$ is the $n-k$-dimensional projection volume of X on $^{\perp}L$ counted with multiplicities	$V_{\perp L}$ is the Lebesgue measure on $^{\perp}L$ and $p_k(X,L)$ the $n-k$-dimensional projection volume of X on $^{\perp}L$ counted with multiplicities
Table 5.2	160	7	[299] [195] [368]	[310] [202] [384]
5.3	166	-7	extended Steiner formula (2.18)	special case (2.18) of the extended Steiner formula [217, p. 632]
5.3.1	167	(5.8)	$\xi_\ell,\ \xi_{\nu-\ell}$	$x+\xi_\ell,\ x+\xi_{\nu-\ell}$
5.3.1	167	-11	$W\ominus\check{C})\cap\mathbb{L}^n\neq\emptyset$	$(W\ominus\check{C})\cap\mathbb{L}^n\neq\emptyset$
5.3.1	167	-5	the estimation method given by the left-hand side of (5.9)	the estimation method given by (5.9)
5.3.1	168	-9, -10	where the $b_{j\ell}$ are integers with $\sum_{\ell=0}^{\nu} b_{j\ell}=0$ for $j=1,\dots,\nu$, what can be seen from the particular case $\Xi=\emptyset$.	where the $b_{j\ell}$ are integers.
5.3.5	172	-13	considerably, reduced	considerably reduced
5.3.5	173	-2	$\mathbb{E}\tilde{S}_V=\frac{2\pi}{a^2}\sum_{j=0}^{21}\bar{g}_j^{(2)}\mathbb{P}(\eta_j\subset\Xi^c)$	$\mathbb{E}\tilde{M}_V=\frac{2\pi}{a^2}\sum_{j=0}^{21}\bar{g}_j^{(2)}\mathbb{P}(\eta_j\subset\Xi^c)$
5.3.6	177	-13	an scaling factor	a scaling factor
5.4	179	-6	macroscope	macroscopically homogeneous random set
Remark 5.8	182	9	Ψ_2	Φ_2
5.4.4	186	-18	$\lambda_1=cr^2\ c\gg 1$	$\lambda_1=cr^2,\ c\gg 1$
5.5.1	191	6	$\mathrm{vol}\big(\{x\in\mathbb{R}^n:(\mathrm{EDT}_{\Xi^c}\mathbb{1}_\Psi\mathbb{1}_{W\ominus B_r})(x)\leq r\}\big)$	$\mathrm{vol}\big(\{x\in(W\ominus B_r)\cap\Psi:\mathrm{EDT}_{\Xi^c}(x)\leq r\}\big)$
Remark 5.12	192	3	F_θ of Ξ	F_θ of Ξ^c
Remark 5.13	192	11	$G(r)=1-\frac{1-V_V(\Xi\circ Y_r)}{1-V_V(\Xi)}$	$G(r)=1-\frac{V_V(\Xi\circ Y_r)}{V_V(\Xi)}$

Table 4: Typos, wrong references and symbols, Chapter 5.

Section	page	line	is	should read
Chapter 6				
6.2	197	Fig. 6.1	window W.	window W, where c_W is the window function.
6.2.1	197	-2	$\in \Xi$	$\subset \Xi$
6.2.1	200	1	$\mathrm{Cov}(-dx)$	$\mathrm{Cov}(dx)$
6.2.1	200	13	$\frac{1}{2} - \lceil x \rceil - x$	$\frac{1}{2} - \lceil x \rceil + x$
6.4.1	213	5	$S(X, A) = \frac{1}{2}\mathscr{H}^{n-1}(\partial X \cap A)$	$S(X, A) = \mathscr{H}^{n-1}(\partial X \cap A)$
6.4.3	220	(6.13)	$\hat{c}_W$	c_W
6.4.3	220	-14	$\lim\limits_{\varepsilon \downarrow 0}$	$\lim\limits_{\varepsilon \to \infty}$
Chapter 7				
7.2.2	235	15	$2\mathrm{e}^{-2w_n r^n}$	$\lambda \mathrm{e}^{-\lambda \kappa_n r^n}$
7.2.3.2	238	8	$\exp(,)$	$\exp(\alpha)$
7.6.2	260	Def. 7.7	$C(x) = \{z \in \mathbb{R}^3 : \|\|z - x\|\| \leq \|\|z - y\|\|$ for all $y \neq x,\ y \in \varphi\}$	$C(x) = \{z \in \mathbb{R}^3 : \|\|z - x\|\| \leq \|\|z - y\|\|$ for all $y \in \varphi\}$
Table 7.4	269	-23	and the deduced estimates for the scaling factor k	and the deviation of the deduced estimates for the scaling factor from the true $k = 0.0464$
Table 7.4	269	-20	$k_L,\ k_\chi$	$\hat{k}_L/k,\ \hat{k}_\chi/k$

Table 5: Typos, wrong references and symbols, Chapters 6-8.

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