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

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June 21, 2021

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

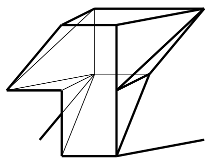

Figure 3.4c: the discretization $X \sqcap \mathbb{F}_{14.1}$

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 [mm^3]	$\widehat{\chi_V}$ [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	$\|x\|_p = \left(x_1^2 + \dots + x_n^2\right)^{\frac{1}{p}}$	$\|x\|_p = \left(x_1^p + \dots + x_n^p\right)^{\frac{1}{p}}$
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	$\kappa_1(s), \dots, \kappa_{n-2}(s)$	$\kappa_1(s), \dots, \kappa_{n-1}(s)$
2.1.2	15	7	$\kappa_1(s), \dots, \kappa_{n-2}(s)$	$\kappa_1(s), \dots, \kappa_{n-1}(s)$
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 $k = 0, \dots, m$	for $k = 0, \dots, n$
2.2.5	25	-3	$X \oplus (Y + x)$	$X \cap (Y + x)$
2.2.5	26	Eq. (2.16)	for $j = 0, \dots, n$	for $j = 0, \dots, k$
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 $0 \le T(K) \le 1$, $K \in \mathcal{K}$	on $\mathcal{C}$ with $0 \le T(C) \le 1$, $C \in \mathcal{C}$
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	$44.6\,\text{mm} \times 44.6\,\text{mm} \times 16.3\,\text{mm}^3$	$44.6\,\text{mm} \times 44.6\,\text{mm} \times 16.3\,\text{mm}$
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)	$\int\limits_0^\infty$	$\int\limits_{-\infty}^\infty$
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	$\chi(X) = \sum\limits_{i=1}^{m} \chi(X_i) - \sum\limits_{i=1}^{m-1} \sum\limits_{j=1}^{m} \chi(X_i \cap X_j)$	$\chi(X) = \sum\limits_{i=1}^{m} \chi(X_i) - \sum\limits_{i=1}^{m-1} \sum\limits_{j=i+1}^{m} \chi(X_i \cap X_j)$
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	$\lVert \nabla f_0 \rVert - a^2$	$\lVert \nabla f_0 \rVert + a^2$
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 $j = 1, \ldots, \nu$, 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	$\mathrm{vol}\left(\{x \in \mathbb{R}^n : (\mathrm{EDT}_{\Xi^c} \mathbb{1}_\Psi \mathbb{1}_{W \ominus B_r})(x) \leq r\}\right)$	$\mathrm{vol}\left(\{x \in (W \ominus B_r) \cap \Psi : \mathrm{EDT}_{\Xi^c}(x) \leq r\}\right)$
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	$C(x) = \{z \in \mathbb{R}^3 : \|\|z - x\|\| \leq \|\|z - y\|\| \text{ for all } y \neq x,\ y \in \varphi\}$	$C(x) = \{z \in \mathbb{R}^3 : \|\|z - x\|\| \leq \|\|z - y\|\| \text{ for all } y \in \varphi\}$
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_χ	$\hat{k}_L/k$, $\hat{k}_\chi/k$

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

Acknowledgements
We thank colleagues and readers for pointing out errors. Particular thanks to Jiří Janáček, Institute of Physiology, Academy of Sciences of the Czech Republic, Lukas Hahn from Ulm University, Claudia Redenbach from the Technical University Kaiserslautern, and René Ciak from Fraunhofer ITWM.