

# Index of notation

notation	name	where defined
$\mathbf{a}, \mathbf{b}, \dots$	1-tensors (“vectors”)	Section A.1
$\mathbf{a} \cdot \mathbf{b}$	euclidian inner product on $\mathbb{R}^3$	Section A.1
$\mathbf{a} \otimes \mathbf{b}$	tensor product of two vectors	(A.2)
$\mathbf{A}, \mathbf{B}, \dots$	2-tensors (“matrices”)	Section A.1
$\mathbf{I}$	identity 2-tensor	Section A.1
Lin	space of 2-tensors or linear mappings on $\mathbb{R}^3$	Section A.1)
trace $\mathbf{A}$	Trace of a 2-tensor	(A.3)
det $\mathbf{A}$	determinant of a 2-tensor	(A.5)
$\iota_1, \iota_2, \iota_3$	3 invariants of a 2-tensor	(A.6)
$\mathbf{A}^*$	transpose or adjoint of a 2-tensor	(A.1)
$\mathbf{A}^{-*}$	inverse of $\mathbf{A}^*$	
$\mathbf{A} : \mathbf{B}$	inner product on Lin	(A.4)
$\mathbf{T}$	first Piola-Kirchoff stress tensor	(2.4)
$\mathbf{S}$	second Piola-Kirchoff stress tensor	(2.4)
$\mathbf{C}$	right Green-Lagrange stress tensor	(2.1)
$\mathbf{E}$	material strain tensor	(2.21)
$\mathcal{E}$	linear approximation to $\mathbf{E}$	(2.22)
$\mathbf{Z}$	tetrahedron shape tensor	(2.32)
$\rho$	mass density	(2.2)
$\mathbf{z}$	coordinates in reference configuration	Section 2.1
$\mathbf{p}(\mathbf{z}, t)$	motion	Section 2.1
$\mathbf{u}(\mathbf{z}, t)$	displacement	(2.20)
$\lambda$	Lamé parameter	(2.17)
$\mu$	Lamé parameter	(2.17)
$E$	Young’s modulus	(2.18)
$\nu$	Poisson ratio	(2.19)
$c$	wave speed	
$\nabla f, \text{grad } f$	gradient of a function $f$	
$\mathbf{d}$	search direction	Section 2.4.2

$r'$	discretized elastic forces	Section 2.4.1
$r$	discretized residual forces	Section 3.1
$K$	stiffness matrix	(2.29)
$C$	damping matrix	(2.55)
$M$	mass matrix	(2.52)
$\Pi$	virtual work function	(2.40)
$V(\mathcal{B})$	domain of the partial differential equation	(2.26)
$V_h(\mathcal{B})$	finite-dimensional subset of $V(\mathcal{B})$	(2.27)
$W$	energy density	(2.14)
$(u, v)_A$	inner product $u^T A v$	(2.44)
$\ u\ _A$	norm associated with $A$ , $\sqrt{(u, u)_A}$	(2.44)
$\text{cond}_2(A)$	2-norm condition number of $A$	(2.47)
$\sigma, \tau$	simplexes	Chapter 7
$\Delta_j$	(scalpel) sweep triangles	Section 3.2
$\ \cdot\ _2$	euclidian or $L_2$ norm	
$\ \cdot\ _\infty$	maximum or supremum norm	