

# A Bibliography of Publications of Nicholas John Higham

Nicholas John Higham  
School of Mathematics  
University of Manchester  
Manchester M13 9PL  
England

Tel: +44 (0)161 275 5800  
FAX: +44 (0)161 275 5819

E-mail: nick.higham@manchester.ac.uk (Internet)

08 August 2024  
Version 1.100

## Abstract

This bibliography records publications of Nicholas John Higham.

**0** [Hig05a]. **0-471-11111-2** [Hig99a].  
**0-89871-561-X** [Hig05a].

**100-Digit** [Hig05a]. **17th** [HWG98]. **18th** [WG00]. **1986** [IP87]. **1992** [MGD93]. **1997** [HWG98].

## Title word cross-reference

**1** [CH01a, CH01b, HT00]. **2** [HR14b].  **$3 \times 3$**  [HN16]. **\$57.00** [Hig05a].  **$T$**  [Hig99f].  **$a$**  [CDHJ07].  **$A^\alpha$** ,  **$\log(A)$**  [HHT08].  
 **$AX - XB = C$**  [Hig92f, Hig93f, Hig93e].  
 **$C_n(x)$**  [Hig93b, Hig96b, Hig97a].  **$f$**  [DH05].  
 **$f(A)b$**  [DH05].  **$J$**  [Hig03a].  **$LU$**  [DHS95, FH21b, HHP21, HM22b].  **$LDL^T$**  [Hig97f].  **$p$**  [BHM05, GH06, Hig92a, HL11a].  
 **$QR$**  [CH97b, Hig90h, Hig91b, Hig98a, Hig00a, Hig03b].  **$S_n(x)$**  [Hig93b, Hig96b, Hig97a].  
 **$s \exp(s) = a$**  [CDHJ07].  **$W$**  [CDHJ07, FHI15].

**2017** [BBdD17]. **2022** [Ano22]. **24th** [BBdD17]. **29th** [WG00]. **2nd** [WG00].

**60th** [Ano22, Hig92b]. **679** [DDHD90].

**'98** [ALM99].

**accelerate** [HBT+20]. **Accelerating** [CH18]. **acceleration** [HS16a]. **Accuracy** [CH97a, CH99c, Hig89a, Hig96a, Hig98e, Hig99d, Hig02a, Hig05a, CH00a, CHKL01, Hig93a]. **Accurate** [BHM20, Hig90f, Hig98a, CH17, Hig00a, Hig00b]. **Accurately** [BHH21]. **Acta** [Hig96d]. **Action** [AMH11, HK17, Fis17]. **Adaptive** [ADF+19]. **Add** [BHL+19, BHL+20].

**-Norm** [CH01a, CH01b, HT00, Hig92a].  
**-Orthogonal** [Hig03a]. **-th** [HL11a].

**Advanced** [MGD93]. **Advances** [Ano22]. **Again** [HS98]. **AI** [Fis17]. **Al-Mohy** [Fis17]. **Alan** [Hig06a]. **Algebra** [ACD<sup>+</sup>21, Ano22, DDHD90, HH22, Hig85b, HS87, Hig94d, Hig94e, Hig95e, Hig97d, Hig97j, Hig98e, Hig99a, Hig99b, Hig00c, HHL01, Hog07, MGD93, HM20, HM22a, MP93, Hig99e]. **Algebraic** [Bro07, GH07, Wil23]. **Algorithm** [AMH10b, BHH93, CH96b, CH98a, CH01a, CH01b, DH03, GHT10, Hig88a, Hig91a, HP94a, HP94b, HT00, Hig03b, HL11b, HL21, AMH09b, BH10, FHI15, FH19, Fis17, GHT09b, HL13, HN16, DDHD90, Hig89c]. **Algorithms** [AMH12, AMHL22, AH16, BHM05, BHM20, DH16, DH90b, DH92a, Hig86b, Hig87b, Hig90k, Hig96a, Hig98e, Hig99d, Hig02a, Hig06b, NH13, AMHR15, BHP03a, DGH20, FH18a, HH05a, HM22a, Hig23, Hig96f]. **Alley** [Hig01b]. **alternating** [HS16a]. **always** [CDHJ07]. **Analysis** [ALM99, BHL<sup>+</sup>19, CH23, DHT01, FHL<sup>+</sup>23b, Hig87b, Hig90a, Hig90k, HK93a, Hig97e, Hig98b, Hig99d, Hig06a, HM19a, IP87, THDC09, BBDH14, BHL<sup>+</sup>20, CH17, CHM21, DW97, Hig93e, HWG98, HK00, HM20, WG00, ALM99, Hig02d]. **Analyst** [Hig99c]. **analyzing** [GHT11]. **Anderson** [HS16a]. **Anonymous** [Hig92c]. **Anton** [Hig95e]. **Anymatrix** [HM22c]. **Appl.** [Hig93b, Hig96b, Hig97a]. **Application** [AMH09a, AMH11, BHL<sup>+</sup>19, FHL<sup>+</sup>23b, HT00, HŠ16, HPZ19, AMH08, AH14, BHL<sup>+</sup>20, CH17, GHP18]. **Applications** [Hig86a, Hig88a, Hig89c, Hig89e, Hig90j, Hig95e, Hig07b, MP93, MGD93, TH02, HT02, TH01, Hig06b]. **Applied** [GH04, Hig99a, Hig00c, Hig02e, HDG<sup>+</sup>15, MP93, Hig14]. **Applied/Computational** [GH04]. **Approach** [HM19a, AHTW01]. **approximants** [Hig01a]. **Approximate** [ABH<sup>+</sup>23]. **Approximating** [CH00a, CHKL01]. **approximation** [AMH10a]. **Approximations** [HM19b]. **April** [IP87]. **Arbitrary** [AMHL22, HS90, FH19]. **Arc** [GHT10, GHT09b]. **Arising** [HC96, HC98]. **ARITH** [BBdD17]. **Arithmetic** [BBdD17, FHL<sup>+</sup>23b, Hig91d, HK95, Hig02e, Hig17a, Hig18e, HP19, HTDH18, HP21]. **Arnold** [Hig02d]. **Art** [IP87, DW97]. **associated** [HTV02]. **asynchronous** [BBDH14]. **August** [Bro07, MGD93].

**Backward** [CH98c, CH98d, CH99b, CH00b, HH92a, Hig92f, HH96b, HH98, HH99, HLT07, HLT08, NH12, CHM21, Hig93f, Hig93e, HM20]. **Baker** [HF17]. **Baltimore** [Hig90i]. **Barnett** [Hig90j]. **barycentric** [Hig04]. **Based** [CH96b, CH98a, AHH16, CHP20, SLEK19]. **Basic** [ACD<sup>+</sup>21, DDHD90, HM20, Hig85a, Hig86c]. **Batched** [ACD<sup>+</sup>21]. **Be** [HS22]. **Behavior** [HK93b, Hig07c, FHMP21]. **Belgium** [MGD93]. **bfloat16** [Hig18e]. **Biennial** [HWG98, WG00]. **Bini** [Hig96f]. **Birkhäuser** [Hig96f]. **Birmingham** [IP87]. **Birthday** [Ano22, Hig92b]. **Björck** [Hig87b]. **BLAS** [DDP94, DH90b, DH92a, Hig90e]. **Block** [BHL<sup>+</sup>19, CH01a, CH01b, DDP94, DH90b, DHS92, DH92a, DHS95, Hig97f, HT00, HŠ16, ADF<sup>+</sup>19, BHL<sup>+</sup>20, Hig99f, HM22b]. **block-Jacobi** [ADF<sup>+</sup>19]. **Bohemian** [Hig18b]. **Book** [Hig98b, Hig99a, Hig99b, Hig05a]. **Books** [Hig99b]. **Bornemann** [Hig05a]. **Bounding** [Hig90b]. **Bounds** [CH98c, DH90a, DH93, Hig90c, HT01, HT03, HS16b, CH99b, Hig83b]. **Bruaset** [Hig96e]. **Bur.** [Hig93b, Hig96b, Hig97a].

**C** [Hig90i, Hig90j, Hig93b, Hig96b, Hig97a, Hig00c]. **Cambridge** [Hig96d, Hig02d]. **Canada** [Bro07]. **Canonical**

[HMT10, HMT10]. **Cayley** [Hig08a]. **Celebrating** [Ano22, HH19]. **centrality** [AHH16]. **CERFACS** [HHK93]. **chains** [MP93]. **Challenge** [Hig05a]. **Chebyshev** [Hig93b, Hig96b, Hig97a]. **Cholesky** [CH96b, CH98a, DHT01, Hig90a]. **Chris** [Hig95e]. **Christoph** [Hig98b]. **Christopher** [HF17]. **Chu** [Hig06b]. **Class** [BHM20]. **Cleve** [Hig99c]. **closest** [AHTW01]. **Codes** [Hig88a, Hig89c]. **Collection** [Hig89b, Hig91a, BHM<sup>+</sup>13, HM22c, ZH16]. **Combining** [ABH<sup>+</sup>23]. **Commentaries** [CGO07]. **Commentary** [Hig07b, Hig93b, Hig96b, Hig97a]. **Companion** [HDG<sup>+</sup>15]. **Complete** [Hig98a, Hig00a, Hig00b]. **completion** [GHP18]. **Complex** [Hig88a, Hig89c, Hig92e, Hig96c, AMH10a, Hig98c]. **Componentwise** [HH92b, HK93a, Hig94d, Hig94e]. **Computation** [Bro07, CGO07, Hig98b, Hig98a, Hig02c, Hig08b, Hig15, Hig00a, Hig00b]. **Computational** [GH04, DGH20]. **Computations** [HHK93, Hig85a, Hig86c, Hig89d, Hig90i, Hig93d, Hig96f]. **compute** [HN16]. **Computer** [BBdD17]. **Computers** [Hig00c]. **Computing** [AMH08, AMH09a, AMH11, AMHR13, AMHL22, BHR10, BH95, BH96, DH03, DH05, FHL23a, HHT08, Hig86a, Hig86b, Hig87a, HS87, Hig88b, Hig90c, HP94a, HP94b, Hig02b, Hig02e, HS03, HMMT04, Hig05a, HAM10, HK17, HL21, NH18, NH12, THDC09, AMHR15, AH14, BHH21, FH18a, Fis17, HS16a]. **Computing/Numerical** [THDC09]. **Condition** [AMH09a, FH21b, Hig83a, Hig86b, Hig87c, Hig88a, Hig89c, HH92a, HH96b, HH98, HH99, HR14b, AMH08, AMHR13, FH21a, Hig83b, HR14a]. **conditioned** [CH17]. **Conditioning** [HMT06]. **Conference** [HWG98, HHL01, IP87, WG00]. **Confluent** [Hig90k]. **Connection** [BHH93]. **Conquer** [NH13]. **Constrained** [CH97a, CH98c, CH98d, CH99c, CH00b, BHP03a, CH99b]. **Continuation** [BH95, BH96]. **contour** [HHT08]. **Contribution** [HH22]. **control** [HT02]. **Cores** [BHL<sup>+</sup>19, FHL<sup>+</sup>23b, BHL<sup>+</sup>20, FHMP21, HTDH18, HBT<sup>+</sup>20]. **Correlation** [BHR10, DH00, HS16b, HSŠ16, AHTW01, BH10, GHP18, Hig02b, HS16a]. **Corrigendum** [Hig89c]. **Cosine** [AMHL22, HS03, AMHR15, HH05a]. **Course** [HL15]. **Covariance** [LHP14]. **Craft** [Hig01b]. **Creative** [HS22]. **creativity** [HS23].

**D** [Hig99a, Hig99e]. **Danny** [Hig00c]. **Dario** [Hig96f]. **data** [Hig18d, HM20]. **days** [WG00]. **Decomposition** [Hig86a, Hig90a, HS90, HP93, Hig94c, HP94a, HP94b, HMMT04, HMT10, NH12, NH13, HMT10, HN16]. **Definite** [CH98b, DHT01, GHT10, Hig96c, HMT09, CH99a, GHT09b, Hig90a, Hig98c, HTV02, HP21]. **Definiteness** [HSŠ16]. **Dense** [Hig97d]. **Depot** [ZH16]. **Derivative** [AMH09a, AMHL22, HL21, AMH08, AMH10a, AMHR13, HR14a]. **Derivative-Free** [HL21]. **Derivatives** [HR14b, HL13]. **Detecting** [GHT08, GHT09a, GHT10, HTV02, GHT09b]. **Developing** [THDC09]. **Developments** [Hig97d]. **Diagonal** [Hig95c, Hig95b, Hig97g]. **Dictionary** [Hig94f]. **difference** [Hig18a]. **Differentiation** [Hig18a]. **Digit** [Hig05a]. **Direct** [Hig93d]. **Dirk** [Hig05a]. **discovery** [HS23]. **Distance** [HS16b]. **Distributed** [SLEK19]. **Distributed-memory** [SLEK19]. **Divide** [NH13]. **Dongarra** [Hig00c, HH22]. **Duff** [Hig00c]. **Dundee** [HWG98, WG00]. **during** [WG00].

**early** [Hig08a]. **Editing** [Hig01b]. **Edition** [Hig90i, Hig95e]. **eds** [Hig90j]. **Efficient** [HH05a, Hig86b, NH13]. **Eigenproblem** [DHT01]. **Eigenproblems**

[HLT08, GHT11, HLT07]. **Eigenvalue** [CH98b, GHT09a, HH96b, HH98, HH99, Hig06b, NH13, TH02, BHM<sup>+</sup>13, CH99a, GHT08, HTV02, HT02, HMTG08, TH01]. **Eigenvalues** [HT01, HT03]. **Eighth** [HHL01]. **Elementary** [Hig95e]. **Elements** [HR16]. **Elimination** [CH98d, CH00b, HH89, Hig90b, Hig90f]. **elliptic** [HTV02]. **Embree** [Hig07c]. **Engineers** [Hig01b, Hig06a]. **Enhances** [Hig90h, Hig91b]. **entropy** [LHP14]. **EPSRC** [ALM99]. **Equality** [CH97a, CH98d, CH99c, CH00b, BHP03a]. **Equation** [GH07, HK02, HK00, HK01]. **Equations** [Hig90h, Hig91b, Hig91c]. **Error** [BHL<sup>+</sup>19, CH23, CH98c, DH90a, DH93, FHL<sup>+</sup>23b, Hig87b, Hig90b, Hig90c, HH92a, Hig92f, HK93a, HH96b, HH98, HH99, HLT08, HM19a, HM19b, BHL<sup>+</sup>20, CHM21, CH99b, Fis17, Hig93f, Hig93e, HLT07, HM20]. **Errors** [Wil23, DH13]. **Essex** [Hig96e]. **Estimating** [Hig88a, Hig89c, Hig92a, HR14a, HR16, AMHR13]. **Estimation** [AMH09a, CH01a, CH01b, Hig87c, Hig88a, Hig89c, HT00, AMH08, Fis17]. **Estimator** [Hig90d]. **Evaluating** [Hig01a]. **Ever** [HS98]. **Exact** [HK02, HK01]. **Exercises** [Hig02e]. **exp** [BHH21]. **Experience** [Hig90d]. **Explicit** [GHP18]. **Exploiting** [Hig90e, HP21]. **Exploits** [HM19b]. **Exponential** [AMH09a, AMH10b, AMH11, Hig05d, Hig09, AMH08, AMH09b, AH14, AHH16, FH19, Fis17]. **exponential-based** [AHH16]. **extensible** [HM22c, ZH16]. **extreme** [FH21a, Hig23]. **extreme-scale** [FH21a].

**F** [Hig90i]. **Fête** [Hig92b]. **Factor** [BHR10]. **factorisations** [HLS21]. **Factorization** [BHP03b, CH96b, CH98a, CH23, CH97b, CH98e, DHS92, DHS95, FH21b, Hig90h, Hig91b, Hig97f, Hig98a, HM19b, HHP21, Hig99f, Hig00a, Hig00b, HM22b]. **Factorizations** [ABH<sup>+</sup>23, Hig07b].

**Factorizing** [Hig96c, Hig98c, HL22]. **Factors** [DH00, HH89]. **Fast** [BHM20, DH90b, DH92a, Hig88c, Hig90e, Hig90g, HS90, HTDH18]. **Featured** [Hig99b]. **Field** [BH95, BH96]. **FIMA** [FH18b]. **finance** [Hig02b]. **Finite** [HK93b, HK95]. **Fitting** [Hig99c]. **Fixed** [HSS16]. **Floating** [Hig91d, Hig02e, HP19, Hig93a]. **Floating-Point** [HP19]. **focus** [Hig18d]. **Folkmar** [Hig05a]. **form** [HLS21]. **FORTRAN** [Hig88a, Hig89c]. **fp16** [Hig18e, HTDH18]. **Fractional** [HL11b, HL13]. **Framework** [SLEK19, GHT11]. **Fréchet** [AMH08, AMH09a, AMH10a, AMHR13, AMHL22, HL13, HR14a, HR14b]. **Free** [HL21]. **FTP** [Hig92c]. **Function** [DH16, Hig08e, AMH10a, AH14, CDHJ07, FHI15, HR14a, LHP14]. **Functions** [AH16, DH03, HMMT05, Hig07a, Hig08b, HR14b, HL15, HK17, HL21, NH18, BHH21, DH05, HHT08, HAM10]. **Fundamental** [Hig96f]. **Fused** [BHL<sup>+</sup>19, BHL<sup>+</sup>20].

**G** [Hig90i]. **Gaussian** [HH89, Hig90b, Hig90f]. **Gene** [Hig06b, CGO07, Hig08c, Hig08d]. **Generalized** [CH98b, DHT01, HH96b, HH98, HH99, HMT10, CH99a, HMT10]. **Generating** [FH21a, HHP21]. **Generation** [DH00, Hig03a]. **given** [MP93]. **Gives** [Hig16a]. **GMRES** [CHP20]. **GMRES-based** [CHP20]. **Golub** [Hig90i, Hig06b, CGO07, Hig92b, Hig08c, Hig08d]. **Gover** [Hig90j]. **GPU** [BHL<sup>+</sup>19, BHL<sup>+</sup>20, FHL<sup>+</sup>23b, HTDH18]. **GPUs** [HBT<sup>+</sup>20]. **Graduate** [ALM99]. **Greet** [GH04]. **Groups** [HMMT04, HMMT05]. **Growth** [HH89, HHP21]. **Guide** [ALM99, HH00, Hig01b, HS22, HH05b, HH17].

**H** [CGO07, Hig90i, Hig06b, HF17]. **Half**

[Hig18e, HPZ19]. **Hamilton** [HS23]. **Hand** [HH92b]. **Handbook** [Hig93c, Hig94b, Hig98d, Hig20, Hog07]. **hardcover** [Hig05a]. **Hardy** [HH19]. **Harnessing** [HTDH18]. **held** [IP87, MP93, WG00]. **Henk** [Hig00c]. **Hermitian** [CH98b, CH99a, GHT09b, GHT10, HTV02]. **High** [Hig00c, Hig05a, THDC09, DGH20]. **High-Accuracy** [Hig05a]. **High-Performance** [Hig00c, THDC09, DGH20]. **Higham** [Ano22, Ano24a, Ano24b, Fis17, HT24, NN24]. **Higher** [HR14b]. **Historical** [Hig16b]. **Hopkins** [Hig90i]. **Hosts** [HHK93, Hig97c]. **Householder** [CH23, CH97b, CH98e]. **Howard** [Hig95e]. **Hundred** [Hig02e]. **Hyperbolic** [AH16, BHP03b, GHT09a, HK17, GHT08, HTV02].

**Iain** [Hig00c]. **Identities** [DH16]. **Identity** [FHL23a]. **IEEE** [BBdD17, Hig02e]. **ill** [CH17]. **ill-conditioned** [CH17]. **IMA** [IP87, Hig92b]. **IMA/SIAM** [IP87]. **Imaginary** [Hig96c, Hig98c]. **impact** [ZHLT22]. **Implementation** [CH01a, CH01b, DDP94, DDHD90]. **implemented** [BBDH14]. **Improved** [AMH12, DH90a, DH93, GHT10, GHT09b, HL13]. **Inaugural** [Hig97c]. **Including** [Hig02e]. **Indefinite** [BHP03b, CH96b, CH98a, BHP03a]. **Industrial** [Hig00c, Hig02e]. **Inertia** [HC96, HC98]. **Infinity** [FH21b]. **Infinity-Norm** [FH21b]. **Influence** [HH22, DH13, Hig14]. **Institute** [MP93, MGD93]. **insurance** [GHP18]. **Integer** [HLS21]. **integrals** [HHT08]. **Integrators** [AMH11]. **International** [Bro07, HHL01]. **interpolation** [Hig04]. **Interview** [Hig05b, Hig05c, Hig08c, Hig08d]. **Introduction** [Hig93b, Hig96b, Hig97a, Hig02d]. **Inverse** [AMH12, AH16, GH06, HP94c, Hig06b].

**Inversion** [BHH93, DH90c, DH92b]. **Involving** [Hig88c]. **Irish** [Hig97c]. **ISBN** [Hig99a, Hig05a]. **Iteration** [HK93b]. **Iterations** [Hig97h, HMMT05, NH12, Hig97i]. **Iterative** [ABH<sup>+</sup>23, CH18, DHT01, GH07, Hig90h, Hig91b, HK93a, Hig95d, Hig95a, Hig96e, Hig97b, ADF<sup>+</sup>19, CH17, CHP20, HTDH18, HBT<sup>+</sup>20].

**J** [Hig90j, Hig00c, Hig06a, HT24]. **Jack** [Hig00c, HH22]. **Jacobi** [ADF<sup>+</sup>19, BBDH14]. **James** [Hig97e, HH19]. **January** [MP93]. **Joan** [FH18b]. **John** [Hig99a]. **Johns** [Hig90i]. **Joint** [IP87]. **Jörg** [Hig05a]. **Joy** [Hig92c]. **Julia** [ZH16]. **July** [Ano22, Bro07, BBdD17, WG00]. **June** [HWG98, WG00].

**Kernel** [NH18]. **kernels** [HM20]. **Knuth** [Hig16a].

**Lagrange** [Hig04]. **Lambert** [CDHJ07, FHI15]. **Lancaster** [Hig05b, Hig05c]. **Lanczos** [Hig93b, Hig96b, Hig97a, BH95, BH96]. **LAPACK** [ACD<sup>+</sup>21, CH01a, Hig92d, Hig95d, Hig95a, Hig97b]. **Large** [HH89, HHP21, MGD93]. **Largest** [HR16]. **Laub** [Hig06a]. **Laurie** [Hig05a]. **Lax** [Hig99a, Hig99e]. **LDL** [Hig99f]. **Least** [BHP03b, CH97a, CH97b, CH98c, CH98d, CH98e, CH99c, CH00b, BHP03a, CHP20, CH99b, HP21]. **Lecture** [ALM99, Hig16a]. **lectures** [MP93]. **Leuven** [MGD93]. **Level** [DDP94, DH90b, DH92a, Hig90e, HR14b, DDHD90]. **Level-** [HR14b]. **Level-3** [DDP94, DH92a]. **like** [Hig88c, Hig90k]. **Line** [HK02, HK01]. **Linear** [ACD<sup>+</sup>21, Ano22, CH18, DDHD90, HH22, Hig85b, HS87, Hig90h, Hig91b, Hig91c, HH92a, HH92b, Hig94d, Hig94e, Hig95d, Hig95e, Hig97d, Hig97j, Hig98e, Hig99a, Hig99b, Hig00c, HHL01, HPZ19, Hog07,

MP93, ADF<sup>+</sup>19, CH17, GHT11, HBT<sup>+</sup>20, Hig97b, HM20, HP21, HM22a, HM22b, ZHLT22, Hig99e, MP93, MGD93].

**Linearization** [HLT08, HMT09, HLT07].

**Linearizations**

[HMT06, HMMT07b, HMMT07a]. **Lloyd** [Hig07c]. **Loan** [Hig90i]. **log** [BHH21].

**log-sum-exp** [BHH21]. **Logarithm** [AMH12, AMHR13, CH00a, CHKL01, FH18a, Hig01a]. **London** [BBdD17].

**Longman** [Hig96e]. **loss** [LHP14]. **Low** [FHL23a, HM19b, HP19, HM22b, Hig23].

**Low-Rank** [FHL23a, HM19b, HM22b].

**lower** [HP21]. **LU** [DHS92].

**M** [Hig90j]. **Machine** [BHH93]. **Magnus** [Hig96e]. **management** [GHP18].

**Managers** [Hig01b]. **Manchester**

[GH04, Hig97c]. **Manycore** [SLEK19].

**March** [Hig02d]. **Mark** [Hig07c]. **Markov**

[MP93]. **Maryland** [Hig90i]. **Matching** [AHH16]. **Math.** [Hig93b, Hig96b, Hig97a].

**Mathematical** [Hig93c, Hig94b, Hig94f, Hig98d, Hig16b, Hig20, HS22].

**Mathematicians** [GH04]. **Mathematics** [Hig96e, Hig99a, Hig00c, Hig02e, HDG<sup>+</sup>15, MP93, Hig14, HS23].

**MATLAB** [Hig89b, Hig91a, HH00, Hig02c, HH05b, HH17, HM22c, Hig93g, Hig95g]. **Matrices**

[DH00, FH21b, Hig87c, Hig89b, Hig91a, Hig92e, Hig96c, HC96, HC98, Hig03a,

Hig07c, Hig08b, HSŠ16, HHP21, FH21a, Hig98c, Hig07a, HL11a, Hig18b]. **Matrix**

[AMH09a, AMH10b, AMH11, AMH12, AMHL22, AH16, BHH93, BHR10, CGO07,

CH01a, CH01b, DH03, DH16, DH90c, DH92b, FHL23a, FHL<sup>+</sup>23b, GH06, Hig83a,

Hig85a, Hig86b, Hig86c, Hig86d, Hig87a, Hig88a, Hig88b, Hig89c, Hig89d, Hig89e,

Hig90a, Hig90e, Hig90d, Hig90g, HS90, Hig90i, Hig90j, Hig92a, Hig92e, Hig93d,

Hig93g, Hig94c, HK95, Hig95g, Hig96f, Hig97e, Hig97f, Hig97h, HT00, HT01, HK02,

HS03, HMMT04, HMMT05, Hig05d,

HMT06, Hig07b, HMMT07b, HMT09, Hig09, HL11b, HR14b, Hig15, HL15, HS16b, HR16,

HK17, HPZ19, HL21, HL22, NH18, AMH08, AMH09b, AMH10a, AMHR13, AMHR15,

AHTW01, AH14, BHM05, BH10, CH00a, CHKL01, DH05, FHI15, FH18a, FH19, Fis17,

GHP18, HHT08, HH05a, Hig83b, Hig97i, Hig99f, HK00, Hig01a, HK01, Hig02b, HT03,

HMMT07a, Hig08a, HAM10]. **matrix** [HL13, HR14a, HS16a, HN16, HLS21, HM22c,

ZH16, Hig02c, Hig06a, Hig08e, ZH16].

**Measures** [Hig91d, AHH16]. **Meeting**

[Hig97c]. **memory** [SLEK19]. **Method**

[BH95, BH96, CH97a, CH99c, DHT01, GH06, Hig86d, Hig92e, HP94c, Hig95b,

Hig97g, HK02, Hig05d, Hig09, BBDH14, HK01, HS16a]. **Methods**

[CH98d, CH00b, DH90c, DH92b, Hig90h,

Hig91b, HK93a, Hig96e, Hig98b]. **Michael**

[Hig01b, Hig02e]. **Microcomputer**

[Hig85a, Hig86c]. **Milestones** [CGO07].

**MIMD** [DDP94]. **Mixed**

[ABH<sup>+</sup>23, BHL<sup>+</sup>19, BHL<sup>+</sup>20, HBT<sup>+</sup>20, HM22a, HTDH18]. **Mixed-precision**

[ABH<sup>+</sup>23, HBT<sup>+</sup>20, HTDH18]. **Model**

[DDHD90]. **models** [MP93]. **Modified**

[CH96b, CH98a]. **Modifying** [HC96, HC98].

**Mohy** [Fis17]. **Moler** [Hig99c]. **Moody**

[Hig06b]. **MPI** [BBDH14]. **Multiple**

[HH92b]. **Multiplication**

[FHL<sup>+</sup>23b, Hig90e, Hig90g].

**Multiplications** [Hig92e]. **Multiply**

[BHL<sup>+</sup>19, BHL<sup>+</sup>20]. **Multiply-Add**

[BHL<sup>+</sup>19, BHL<sup>+</sup>20]. **Multiplying** [Hig92e].

**Multiprecision**

[FH18a, Hig17a, HL21, Hig17b]. **Multiword**

[FHL<sup>+</sup>23b].

**N** [Hig07c]. **Nat.** [Hig93b, Hig96b, Hig97a].

**NATO** [MGD93]. **Nearest**

[BHR10, CH98b, Hig88b, HS16b, BH10,

CH99a, Hig02b, HS16a]. **Nearness**

[Hig85b, Hig89e, HTV02]. **Need** [FH21b].

**Neumaier** [Hig02d]. **Neumann** [Hig16a].

**News** [Hig98b]. **Newton** [BH10, GH06, Hig86d, HK01, HK02].  
**Nicholas** [Ano24a, HT24]. **Nick** [Ano22, Ano24b, NN24]. **NLEVP** [BHM<sup>+</sup>13]. **No** [FH21b]. **nonlinear** [BHM<sup>+</sup>13, GHT11]. **Nonnormal** [Hig07c].  
**Nonsymmetric** [GH07]. **Norm** [CH01a, CH01b, FH21b, Hig88a, Hig89c, Hig90d, HT00, Hig92a]. **normwise** [DH13].  
**Notes** [ALM99, Hig96e, Hig98e, Hig99d].  
**Nothing** [HS98]. **Null** [CH97a, CH99c].  
**Number** [AMH09a, FH21b, Hig86b, Hig87c, HR14b, Hig18f, AMH08, AMHR13, FH21a, Hig83b, HR14a]. **Numbers** [Hig83a].  
**Numerica** [Hig96d]. **Numerical** [ALM99, Ano22, DGH20, FHMP21, HH22, Hig85b, HS87, Hig94d, Hig94e, Hig96a, Hig97d, Hig98b, Hig98e, Hig99b, Hig99c, Hig99d, HK00, Hig02a, Hig02d, Hig05a, Hig23, IP87, THDC09, WG00, DW97, Hig04, HMTG08, HM22a, HWG98, Hig00c, Hig02e, WG00].  
**Numerically** [DH00, HM22b]. **NVIDIA** [FHMP21].  
**Obituary** [HT24]. **obstruction** [HLS21].  
**One** [Hig88a, Hig89c, Hig02e]. **One-Norm** [Hig88a, Hig89c]. **Ontario** [Bro07].  
**OpenMP** [BBDH14]. **Operators** [Hig07c].  
**Optimization** [Hig93d, HC96, HC98].  
**Optimizing** [HL22]. **Order** [HR14b].  
**Orthogonal** [Hig88c, Hig03a]. **Overton** [Hig02e]. **Own** [Hig08c]. **Oxford** [Hig90j].  
**PA** [Hig00c, Hig02e]. **Padé** [Hig01a, HL11b, HL13]. **Pair** [CH98b, CH99a, HTV02]. **Pairs** [GHT10, GHT09b]. **Pan** [Hig96f]. **Parallel** [CH01b, DDP94, HP93, HP94a, HP94b, HP94c, Hig95f]. **parametrized** [GHT11].  
**Parlett** [DH03, HL21]. **part** [MP93].  
**Partial** [Hig95b, Hig97g]. **Participants** [Hig92b]. **Partitioned** [HP94c]. **Parts** [Hig96c, Hig98c]. **PC** [Hig89d]. **Pencils** [HMT09]. **Pereyra** [Hig87b]. **Performance** [BBDH14, Hig00c, THDC09, ZHLT22, DH13, DGH20]. **Perturbation** [FHL23a, HH92b, Hig92f, Hig93f, Hig93e, Hig94d, Hig94e].  
**Peter** [Hig99a, Hig99e, Hig05b, Hig05c].  
**Philadelphia** [Hig00c, Hig02e, Hig05a].  
**Pioneering** [Hig99c]. **Pitman** [Hig96e].  
**Pivoting** [FH21b, HH89, Hig95c, Hig95b, Hig97g, Hig98a, HHP21, Hig00a, Hig00b].  
**Point** [Hig91d, Hig02e, HP19, Hig93a].  
**Polar** [Hig86a, HS90, HP93, Hig94c, HP94b, HMMT04, HMT10, NH12, HMT10, HN16].  
**Polynomial** [Hig96f, HLT08, TH02, HT02, HLT07, TH01].  
**Polynomials** [Hig88c, Hig93b, Hig96b, Hig97a, HT01, HMT06, HMMT07b, HMT09, HT03, HMMT07a]. **Positive** [Hig88b, Hig96c, Hig98c, HP21]. **Poster** [HH96a]. **posteriori** [Fis17]. **Powers** [HK95, HL11b, HL13]. **pp** [Hig99a, Hig05a].  
**Practical** [Hig90g, HS22]. **Precision** [AMHL22, BHL<sup>+</sup>19, Hig91d, HK93b, HK95, Hig18e, HP19, HPZ19, ABH<sup>+</sup>23, ADF<sup>+</sup>19, BHL<sup>+</sup>20, CHP20, FH19, HTDH18, HBT<sup>+</sup>20, HP21, HM22a, ZHLT22]. **Precisions** [CH18, Hig23]. **Preconditioned** [Hig96e, BH10]. **Preconditioner** [HM19b]. **preconditioning** [ADF<sup>+</sup>19]. **Preface** [HHL01]. **Prepare** [HH96a]. **Preserving** [HMMT05]. **Press** [Hig90i, Hig90j, Hig96d, Hig02d]. **Princeton** [HDG<sup>+</sup>15]. **Prizewinners** [Hig03b].  
**Probabilistic** [CH23, HM19a, CHM21, HM20]. **Problem** [BHP03b, CH98b, CH97a, CH98d, CH99c, CH00b, Hig88d, AHTW01, BHP03a, CH99a, Hig02b, HTV02]. **Problems** [CH97b, CH98c, CH98e, GHT09a, Hig85b, Hig89e, Hig90c, HH96b, HH98, HH99, Hig06b, TH02, BHM<sup>+</sup>13, CHP20, CH99b, GHP18, GHT08, HTV02, HT02, HMTG08, HP21, TH01].  
**Proceedings** [HHL01, IP87, MGD93, HWG98, Bro07].  
**Processes** [Wil23]. **Processing** [Hig16b].  
**Processors** [DDP94]. **Procrustes** [Hig88d].

**profiles** [DH13]. **programming** [AHTW01]. **Programs** [DDHD90]. **projections** [HS16a]. **Properties** [Hig03a]. **Pseudospectra** [BH95, BH96, HT00, Hig07c, TH02, HT02, TH01]. **Pure** [Hig99a].

**QDWH** [SLEK19]. **QDWH-based** [SLEK19]. **QR** [BHP03b, CH23, CH98e, Hig00b]. **Quadratic** [GHT09a, HK02, GHT08, HK00, HTV02, HMTG08, HLS21]. **quadratic** [HK01]. **quaternions** [HS23]. **queueing** [MP93].

**R** [Hig97e]. **Random** [HHP21, HM20]. **Rank** [FHL23a, HM19b, HM22b]. **Real** [Hig87a, Hig88a, Hig89c, Hig92e, Hig96c, MGD93, Hig98c]. **Real-Time** [MGD93]. **Reducing** [DH13]. **reduction** [ZHLT22]. **Refinement** [ABH<sup>+</sup>23, CH18, DHT01, Hig90h, Hig91b, Hig95d, Hig95a, CH17, CHP20, HTDH18, HBT<sup>+</sup>20, Hig97b]. **Regression** [Hig90c]. **regularization** [LHP14]. **related** [HHT08]. **Relation** [Hig94c]. **relative** [DH13]. **Released** [Hig92d]. **Reliability** [HHK93]. **Remembering** [Ano24b]. **Research** [Hig96e]. **resolvent** [AHH16]. **resolvent-based** [AHH16]. **Restoring** [HSŠ16]. **Review** [Hig90i, Hig90j, Hig95e, Hig96d, Hig96f, Hig96e, Hig97e, Hig98b, Hig99a, Hig99b, Hig99e, Hig00c, Hig01b, Hig02d, Hig02e, Hig05a, Hig06a, Hig06b, Hig07c]. **Reviews** [Hig98b]. **Revisited** [Hig05d, Hig09]. **Rhapsodizing** [Hig18b]. **Riccati** [GH07]. **Right** [HH92b]. **Right-Hand** [HH92b]. **Rise** [Hig17a]. **risk** [GHP18]. **Roadmap** [THDC09]. **Root** [FHL23a, GH06, Hig86d, Hig97h, HMMT05, BHM05, Hig97i]. **Roots** [Hig87a, HL11a]. **Rorres** [Hig95e]. **Rounding** [CH23, HM19a, Wil23, CHM21]. **roundoff** [Fis17]. **Routines** [ACD<sup>+</sup>21]. **Row** [CH98d, CH00b]. **Row-Wise** [CH98d, CH00b]. **Rule** [Hig02e].

**S** [Hig90j, Hig00c]. **Same** [HS98]. **Satisfaction** [Hig16a]. **Scale** [MGD93, FH21a, Hig23]. **Scaled** [FHL23a]. **Scaling** [AMH10b, AMH12, Hig05d, HMTG08, Hig09, AMH09b, FH19]. **School** [ALM99]. **Schott** [Hig97e]. **Schur** [DH03, GH06, HL11b, HL13, HL21]. **science** [DGH20, Hig18d]. **Sciences** [Hig93c, Hig94b, Hig98d, Hig20, HS22]. **Scientific** [Hig96e]. **Scientist** [Hig94f]. **Scientists** [Hig01b, Hig06a]. **Search** [Hig93d]. **Searches** [HK02, HK01]. **Second** [Hig90i]. **Section** [Hig97c]. **Selected** [CGO07, Hig99b]. **Semi** [Hig90a]. **Semi-definite** [Hig90a]. **Semidefinite** [Hig88b, AHTW01]. **sensitivity** [HMTG08]. **separately** [AMHR15]. **Series** [Hig93b, Hig96b, Hig97a]. **Set** [ACD<sup>+</sup>21, DDHD90]. **Seventh** [Hig95e]. **Sharper** [HM20]. **Sheffield** [GH04]. **SHMEM** [BBDH14]. **Short** [HL15]. **Should** [CH96a]. **Shrinking** [HSŠ16]. **SIAG** [Hig03b]. **SIAG/LA** [Hig03b]. **SIAM** [Hig97c, Hig05a, IP87, Hig16a]. **Sides** [HH92b]. **Sign** [Hig94c, HMMT04]. **Simulating** [HP19]. **simultaneously** [AMHR15]. **sine** [AMHR15, HH05a]. **Singular** [HK93b, HP93, HP94a, FH21a]. **Snap** [Hig18c]. **Snippets** [Hig16b]. **Society** [Hig00c, Hig02e, HHL01]. **softmax** [BHH21]. **Software** [Hig97j, Hig98b, SLEK19]. **Solution** [CH18, GH07, Hig88c, HP94c, CH17, CDHJ07, HBT<sup>+</sup>20, HMTG08]. **Solutions** [Hig89a, GHP18]. **Solved** [HLT08, HLT07]. **Solvers** [DH90a, DH93, Hig95f, ADF<sup>+</sup>19, HTDH18, ZHLT22]. **Solving** [BHP03b, CH97a, CH99c, DHT01, GHT09a, Hig87b, Hig90h, Hig90k, Hig91b, Hig91c, HK93b, HK01, HK02, HPZ19, HM22b, GHT08, HP21]. **some** [MP93]. **Sons** [Hig99a]. **Sorensen** [Hig00c]. **Space** [CH97a, CH99c]. **Sparse**



[ABH<sup>+</sup>23, HP94c, ADF<sup>+</sup>19, CH17, ZHLT22]. **specified** [CHKL01, FH21a]. **Spectra** [Hig07c]. **Spectral** [NH13]. **Speed** [Hig03b, HTDH18]. **Springer** [Hig98b, Hig01b]. **Springer-Verlag** [Hig98b, Hig01b]. **Square** [FHL23a, Hig86d, Hig87a, Hig97h, HMMT05, Hig97i]. **Squares** [BHP03b, CH97a, CH97b, CH98c, CH98d, CH98e, CH99c, CH00b, BHP03a, CHP20, CH99b, HP21]. **Squaring** [AMH10b, AMH12, Hig05d, Hig09, AMH09b, FH19]. **Squeezing** [HPZ19]. **Stability** [CH97a, CH97b, CH98e, CH99c, DH90b, DH92a, DHS95, DH90c, DH92b, Hig90h, Hig90k, Hig91b, Hig92e, HP94c, Hig95c, Hig95b, Hig95f, Hig96a, Hig97f, Hig97g, Hig98e, Hig99d, Hig99f, Hig02a, NH12, Hig04, HMTG08, Hig23]. **Stable** [CH98d, CH00b, DH00, Hig97h, Hig97i, NH13, HM22b]. **Stan** [Hig05a]. **Stand** [Hig93b, Hig96b, Hig97a]. **state** [DW97, IP87]. **Stationary** [HK93a, HK93b]. **Statistical** [HS87]. **Statistics** [Hig97e]. **step** [AMH10a]. **Stochastic** [CHM21, HL11a]. **Strassen** [BHH93]. **Strassen-Type** [BHH93]. **Structure** [BHR10, Hig18c, LHP14]. **Structured** [HH92a, HH96b, HH98, HH99, TH01, TH02]. **Student** [ALM99]. **Study** [Hig05a, MGD93]. **Subprograms** [ACD<sup>+</sup>21, DDHD90]. **sum** [BHH21]. **Summation** [BHM20, Hig93a]. **Summer** [ALM99]. **superalgebras** [HLS21]. **Survey** [Hig87c, Hig94d, Hig94e, Hig96e]. **SVD** [Hig98a, Hig00a, Hig00b, NH13, SLEK19]. **Sylvester** [Hig08a, Hig14]. **Symbolic** [Bro07]. **Symmetric** [CH96b, CH98a, DHT01, Hig88b, Hig88d, Hig96c, Hig97f, HMMT07a, HMMT07b, NH13, Hig98c, Hig99f, HP21]. **Symposium** [Bro07, BBdD17]. **System** [DH90a, DH93, Hig95f, ADF<sup>+</sup>19]. **Systems** [CH18, Hig87b, Hig88c, Hig89a, Hig90b, Hig90k, HH92a, HH92b, HK93b, HP94c, Hig95d, HPZ19, SLEK19, CH17, GHT11, HBT<sup>+</sup>20, Hig97b, HP21, HM22b, ZHLT22].

**T** [Hig06b, HF17]. **Tables** [Hig93b, Hig96b, Hig97a]. **Technical** [Hig96e]. **Tensor** [BHL<sup>+</sup>19, FHL<sup>+</sup>23b, BHL<sup>+</sup>20, FHMP21, HTDH18, HBT<sup>+</sup>20]. **Test** [DDHD90, Hig89b, Hig91a, ZH16, Hig93g, Hig95g]. **Testing** [DH16, Hig97j]. **th** [BHM05, HL11a, GH06]. **Their** [DH00, HMT09, HL13]. **Theorem** [Hig02e]. **Theory** [AH16, Hig90j, HH92b, Hig92f, Hig94d, Hig94e, Hig06b, Hig08b, BHP03a, Hig93f, Hig93e, HT02, Hig08a]. **Three** [CH18, CHP20, Hig91d, Hig92e]. **Three-precision** [CHP20]. **Thumb** [Hig02e]. **Time** [MGD93]. **timely** [Hig18d]. **tiny** [DH13]. **Tool** [Hig94a]. **Toolbox** [Hig15, Hig93g, Hig95g, Hig02c, Hig08e]. **Trefethen** [Hig07c]. **Triangular** [Hig87c, Hig89a, HP94c, Hig95f, Hig83b]. **Tribute** [Hig99c]. **Tridiagonal** [Hig86b, Hig90b, Hig97f, Hig99f]. **Trigonometric** [AH16, HK17]. **Tunable** [FH21b]. **Type** [BHH93].

**Ueberhuber** [Hig98b]. **UK** [BBdD17, Hig96e, Hig97c]. **UKIE** [GH04]. **Underdetermined** [DH90a, DH93]. **University** [Bro07, Hig90i, Hig90j, Hig96d, Hig02d, IP87, WG00]. **Unwinding** [Hig18f, AH14]. **Upgrade** [CH96a]. **Upper** [Hig83b]. **USA** [Hig00c, Hig02e]. **Use** [Hig90g]. **Users** [Hig94a]. **Using** [BH95, BH96, DH16, HBT<sup>+</sup>20].

**v** [Hig93b, Hig96b, Hig97a]. **Value** [HP93, HP94a]. **Values** [BH95, BH96, FH21a]. **Vandermonde** [Hig87b, Hig88c, Hig90k]. **Vandermonde-like** [Hig88c, Hig90k]. **variable** [CH00a]. **Vector** [DDP94]. **Verlag** [Hig98b, Hig01b]. **Versatile** [Hig94a]. **Version** [Hig95e, Hig95g, Hig02c]. **Versus**

[Hig18e]. **via** [HP93, HŠ16, LHP14].

**Victor** [Hig96f]. **VIII** [ALM99]. **Volume** [Hig96f, Hig96e]. **Vorst** [Hig00c].

**W** [Hig98b]. **Wagon** [Hig05a]. **Waldvogel** [Hig05a]. **Walsh** [FH18b]. **was** [HS98, WG00]. **Waterloo** [Bro07]. **Wave** [NH18]. **Wave-Kernel** [NH18]. **Weighted** [CH97b, CH98e]. **Which** [Hig94f]. **Wiley** [Hig95e, Hig97e, Hig99a, Hig99e].

**Wilkinson** [HH19]. **Wilson** [HL22]. **Wise** [CH98d, CH00b]. **Within** [Hig90e]. **Word** [Hig16b]. **Words** [Hig08c]. **Works** [CGO07]. **Workshop** [HHK93, Hig92b, MP93]. **world** [Hig17b]. **Writing** [Hig93c, Hig94b, Hig98d, Hig20].

**X** [Hig05a]. **xii** [Hig05a]. **xxvi** [Hig93b, Hig96b, Hig97a].

**Year** [GH04, MP93]. **York** [Hig95e].

## References

**Amestoy:2023:CSA**

[ABH<sup>+</sup>23] Patrick Amestoy, Alfredo Buttari, Nicholas J. Higham, Jean-Yves L'Excellent, Theo Mary, and Bastien Vieublé. Combining sparse approximate factorizations with mixed-precision iterative refinement. *ACM Trans. Math. Software*, 49(1):4:1–4:??, March 2023. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <https://dl.acm.org/doi/10.1145/3582493>.

**Abdelfattah:2021:SBB**

[ACD<sup>+</sup>21] Ahmad Abdelfattah, Timothy Costa, Jack Dongarra, Mark Gates, Azzam Haidar,

Sven Hammarling, Nicholas J. Higham, Jakub Kurzak, Piotr Luszczek, Stanimire Tomov, and Mawussi Zounon. A set of batched basic linear algebra subprograms and LAPACK routines. *ACM Trans. Math. Software*, 47(3):21:1–21:23, June 2021. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <https://dl.acm.org/doi/10.1145/3431921>.

**Anzt:2019:APB**

[ADF<sup>+</sup>19] Hartwig Anzt, Jack Dongarra, Goran Flegar, Nicholas J. Higham, and Enrique S. Quintana-Ortí. Adaptive precision in block-Jacobi preconditioning for iterative sparse linear system solvers. *Concurrency and Computation: Practice and Experience*, 31(6):e4460:1–e4460:??, March 25, 2019. CODEN CCPEBO. ISSN 1532-0626 (print), 1532-0634 (electronic).

**Aprahamian:2014:MUF**

[AH14] Mary Aprahamian and Nicholas J. Higham. The matrix unwinding function, with an application to computing the matrix exponential. *SIAM J. Matrix Anal. Appl.*, 35(1):88–109, 2014. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Aprahamian:2016:MIT**

[AH16] Mary Aprahamian and Nicholas J. Higham. Matrix inverse trigonometric and inverse hyperbolic

- functions: Theory and algorithms. *SIAM J. Matrix Anal. Appl.*, 37(4):1453–1477, 2016. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- [AHH16] Mary Aprahamian, Desmond J. Higham, and Nicholas J. Higham. Matching exponential-based and resolvent-based centrality measures. *Journal of Complex Networks*, 4(2):157–176, 2016. ISSN 2051-1310 (print), 2051-1329 (electronic).
- [AHTW01] M. F. Anjos, N. Higham, M. Takouda, and H. Wolkowicz. A semidefinite programming approach for the closest correlation matrix problem. Technical Report CORR 2001-in progress, University of Waterloo, Waterloo, ON, Canada, 2001.
- [ALM99] Mark Ainsworth, Jeremy Levesley, and Marco Marletta, editors. *The Graduate Student's Guide to Numerical Analysis '98: Lecture Notes from the VIII EPSRC Summer School in Numerical Analysis*, volume 26 of *Springer series in computational mathematics*. Springer-Verlag, Berlin, 1999. ISBN 3-540-65752-5 (hardcover). ISSN 0179-3632. x + 250 pp. LCCN QA 297 G67 1999. The Eighth EPSRC Numerical Analysis Summer School was held at the University of Leicester from the 5th to the 17th of July, 1998.
- [AMH08] **Al-Mohy:2008:CFD**  
Awad H. Al-Mohy and Nicholas J. Higham. Computing the Fréchet derivative of the matrix exponential, with an application to condition number estimation. *SIAM J. Matrix Anal. Appl.*, 30(4):1639–1657, 2008. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- [AMH09a] **Al-Mohy:2009:CFD**  
Awad H. Al-Mohy and Nicholas J. Higham. Computing the Fréchet derivative of the matrix exponential, with an application to condition number estimation. *SIAM J. Matrix Anal. Appl.*, 30(4):1639–1657, 2009. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- [AMH09b] **Al-Mohy:2009:NSS**  
Awad H. Al-Mohy and Nicholas J. Higham. A new scaling and squaring algorithm for the matrix exponential. *SIAM J. Matrix Anal. Appl.*, 31(3):970–989, 2009. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- [AMH10a] **Al-Mohy:2010:CSA**  
Awad H. Al-Mohy and Nicholas J. Higham. The complex step approximation to the Fréchet derivative of a matrix function. *Numerical Algorithms*, 53(1):133–148, January 2010. CODEN NUALEG. ISSN 1017-
- Aprahamian:2016:MEB**
- Anjos:2001:SPA**
- Ainsworth:1999:GSG**

- 1398 (print), 1572-9265 (electronic). URL <http://www.springerlink.com/openurl.asp?genre=article&issn=1017-1398&volume=53&issue=1&spage=133>. [AMHL22]
- Al-Mohy:2010:NSS**
- [AMH10b] Awad H. Al-Mohy and Nicholas J. Higham. A new scaling and squaring algorithm for the matrix exponential. *SIAM J. Matrix Anal. Appl.*, 31(3):970–989, 2010. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- Al-Mohy:2011:CAM**
- [AMH11] Awad H. Al-Mohy and Nicholas J. Higham. Computing the action of the matrix exponential, with an application to exponential integrators. *SIAM Journal on Scientific Computing*, 33(2):488–511, 2011. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic). URL [http://epubs.siam.org/sisc/resource/1/sjoce3/v33/i2/p488\\_s1](http://epubs.siam.org/sisc/resource/1/sjoce3/v33/i2/p488_s1). See [Fis17].
- Al-Mohy:2012:IIS**
- [AMH12] Awad H. Al-Mohy and Nicholas J. Higham. Improved inverse scaling and squaring algorithms for the matrix logarithm. *SIAM Journal on Scientific Computing*, 34(4):C153–C169, 2012. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).
- Al-Mohy:2022:APA**
- Awad H. Al-Mohy, Nicholas J. Higham, and Xiaobo Liu. Arbitrary precision algorithms for computing the matrix cosine and its Fréchet derivative. *SIAM J. Matrix Anal. Appl.*, 43(1):233–256, 2022. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <https://epubs.siam.org/doi/10.1137/21M1441043>.
- Al-Mohy:2013:CFD**
- [AMHR13] Awad H. Al-Mohy, Nicholas J. Higham, and Samuel D. Relton. Computing the Fréchet derivative of the matrix logarithm and estimating the condition number. *SIAM Journal on Scientific Computing*, 35(4):C394–C410, 2013. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).
- Al-Mohy:2015:NAC**
- [AMHR15] Awad H. Al-Mohy, Nicholas J. Higham, and Samuel D. Relton. New algorithms for computing the matrix sine and cosine separately or simultaneously. *SIAM Journal on Scientific Computing*, 37(1):A456–A487, 2015. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).
- Anonymous:2022:ANL**
- [Ano22] Anonymous. Advances in numerical linear algebra: Celebrating the 60th birthday of Nick Higham, 6–8 July 2022. Web

site, 2022. URL <https://nla-group.org/njh60/>.

**Anonymous:2024:NH**

- [Ano24a] Anonymous. Nicholas Higham. Web site, February 14, 2024. URL [https://en.wikipedia.org/wiki/Nicholas\\_Higham](https://en.wikipedia.org/wiki/Nicholas_Higham).

**Anonymous:2024:RNH**

- [Ano24b] Anonymous. Remembering Nick Higham: 1961–2024. SIAM Web site, May 1, 2024. URL <https://sinews.siam.org/Details-Page/obituary-nicholas-j-higham>.

**Burgess:2017:ISC**

- [BBdD17] Neil Burgess, Javier Bruguera, and Florent de Dinechin, editors. *2017 IEEE 24th Symposium on Computer Arithmetic (ARITH 24), London, UK, 24–26 July 2017*. IEEE Computer Society Press, 1109 Spring Street, Suite 300, Silver Spring, MD 20910, USA, 2017. ISBN 1-5386-1966-0 (print), 1-5386-1965-2, 1-5386-1964-4. ISSN 1063-6889. LCCN QA76.9.C62 S95 2017. URL <http://ieeexplore.ieee.org/servlet/opac?punumber=8019911>.

**Bethune:2014:PAA**

- [BBDH14] Iain Bethune, J. Mark Bull, [BH10] Nicholas J. Dingle, and Nicholas J. Higham. Performance analysis of asynchronous Jacobi’s method implemented in MPI, SHMEM and OpenMP. *The International Journal of High*

*Performance Computing Applications*, 28(1):97–111, February 2014. CODEN IHPCFL. ISSN 1094-3420 (print), 1741-2846 (electronic). URL <http://hpc.sagepub.com/content/28/1/97.full.pdf+html>.

**Braconnier:1995:CFV**

Thierry Braconnier and Nicholas J. Higham. Computing the field of values and pseudospectra using the Lanczos method with continuation. Numerical Analysis Report 279, Manchester Centre for Computational Mathematics, Manchester, England, November 1995. 20 pp. Submitted to BIT.

**Braconnier:1996:CFV**

Thierry Braconnier and Nicholas J. Higham. Computing the field of values and pseudospectra using the Lanczos method with continuation. *BIT Numerical Mathematics*, 36(3):422–440, September 1996. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic). URL <http://www.mai.liu.se/BIT/contents/bit36.html>. International Linear Algebra Year (Toulouse, 1995).

**Borsdorf:2010:PNA**

Rüdiger Borsdorf and Nicholas J. Higham. A preconditioned Newton algorithm for the nearest correlation matrix. *IMA Journal of Numerical Analysis*, 30(1):94–107, January 2010. CODEN IJNADH. ISSN

0272-4979 (print), 1464-3642 (electronic). URL <http://imajna.oxfordjournals.org/cgi/content/abstract/30/1/94>; <http://imajna.oxfordjournals.org/cgi/reprint/30/1/94>.

**Balle:1993:STM**

[BHH93] Susanne M. Balle, Per Christian Hansen, and Nicholas J. Higham. A Strassen-type matrix inversion algorithm for the Connection Machine. Technical Report CNC/1993/028, Centre for Novel Computing, University of Manchester, Manchester, England, October 1993. 29 pp.

**Blanchard:2021:ACL**

[BHH21] Pierre Blanchard, Desmond J. Higham, and Nicholas J. Higham. Accurately computing the log-sum-exp and softmax functions. *IMA Journal of Numerical Analysis*, 41(4):2311–2330, October 2021. CODEN IJNADH. ISSN 0272-4979 (print), 1464-3642 (electronic). URL <http://academic.oup.com/imajna/article/41/4/2311/5893596>.

**Blanchard:2019:MPB**

[BHL<sup>+</sup>19] Pierre Blanchard, Nicholas J. Higham, Florent Lopez, Theo Mary, and Srikara Pranesh. Mixed precision block fused multiply-add: Error analysis and application to GPU tensor cores. MIMS EPrint 2019.18, Manchester Institute for Mathematical Sciences, School of Mathematics, The University of Manchester, Manch-

ester, UK, September 24, 2019. URL <http://eprints.maths.manchester.ac.uk/2733/>; [https://en.wikipedia.org/wiki/Bfloat16\\_floating-point\\_format](https://en.wikipedia.org/wiki/Bfloat16_floating-point_format).

**Blanchard:2020:MPB**

[BHL<sup>+</sup>20] Pierre Blanchard, Nicholas J. Higham, Florent Lopez, Theo Mary, and Srikara Pranesh. Mixed precision block fused multiply-add: error analysis and application to GPU tensor cores. *SIAM Journal on Scientific Computing*, 42(3):C124–C141, 2020. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Bini:2005:AMR**

[BHM05] Dario A. Bini, Nicholas J. Higham, and Beatrice Meini. Algorithms for the matrix  $p$  th root. *Numerical Algorithms*, 39(4):349–378, August 2005. CODEN NUALEG. ISSN 1017-1398 (print), 1572-9265 (electronic).

**Betcke:2013:NCN**

[BHM<sup>+</sup>13] Timo Betcke, Nicholas J. Higham, Volker Mehrmann, Christian Schröder, and Françoise Tisseur. NLEVP: a collection of nonlinear eigenvalue problems. *ACM Trans. Math. Software*, 39(2):Art. 7, 28, 2013. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic).

**Blanchard:2020:CFA**

[BHM20] Pierre Blanchard, Nicholas J.

- Higham, and Theo Mary. A class of fast and accurate summation algorithms. *SIAM Journal on Scientific Computing*, 42(3):A1541–A1557, 2020. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic). [Bro07]
- Bojanczyk:2003:ECI**
- [BHP03a] Adam Bojanczyk, Nicholas J. Higham, and Harikrishna Patel. The equality constrained indefinite least squares problem: theory and algorithms. *BIT*, 43(3):505–517, 2003. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic).
- Bojanczyk:2003:SIL**
- [BHP03b] Adam Bojanczyk, Nicholas J. Higham, and Harikrishna Patel. Solving the indefinite least squares problem by hyperbolic QR factorization. *SIAM J. Matrix Anal. Appl.*, 24(4):914–931, October 2003. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/40149>.
- Borsdorf:2010:CNC**
- [BHR10] Rüdiger Borsdorf, Nicholas J. Higham, and Marcos Raydan. Computing a nearest correlation matrix with factor structure. *SIAM J. Matrix Anal. Appl.*, 31(5):2603–2622, 2010. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). [CH96a]
- Brown:2007:PIS**
- C. W. Brown, editor. *Proceedings of the 2007 International Symposium on Symbolic and Algebraic Computation, July 29–August 1, 2007, University of Waterloo, Waterloo, Ontario, Canada*. ACM Press, New York, NY 10036, USA, 2007. ISBN 1-59593-743-9 (print), 1-59593-742-0 (CD-ROM). LCCN QA76.5 S98 2007. ACM order number 505070.
- Corless:2007:SEA**
- [CDHJ07] Robert M. Corless, Hui Ding, Nicholas J. Higham, and David J. Jeffrey. The solution of  $s \exp(s) = a$  is not always the Lambert  $W$  function of  $a$ . In Brown [Bro07], pages 116–121. ISBN 1-59593-743-9 (print), 1-59593-742-0 (CD-ROM). LCCN QA76.5 S98 2007. ACM order number 505070.
- Chan:2007:MMC**
- [CGO07] Raymond H. Chan, Chen Greif, and Dianne P. O’Leary, editors. *Milestones in Matrix Computation: the Selected Works of Gene H. Golub with Commentaries*. Oxford University Press, Walton Street, Oxford OX2 6DP, UK, 2007. ISBN 0-19-920681-3. xi + 565 + 3 pp. LCCN QA188 .G67 2007. URL <http://www.loc.gov/catdir/enhancements/fy0737/2007276086-d.html>.
- Carlisle:1996:LSY**
- David P. Carlisle and Nicholas J.

- Higham.  $\text{\LaTeX}2_{\epsilon}$ : Should you upgrade to it? *SIAM News*, 29 (1):12, January/February 1996. [CH98a] ISSN 0036-1437.
- [CH96b] Sheung Hun Cheng and Nicholas J. Higham. A modified Cholesky algorithm based on a symmetric indefinite factorization. Numerical Analysis Report 289, Manchester Centre for Computational Mathematics, Manchester, England, April 1996. 18 pp. To appear in *SIAM J. Matrix Anal. Appl.*
- [CH97a] Anthony J. Cox and Nicholas J. Higham. Accuracy and stability of the null space method for solving the equality constrained least squares problem. Numerical Analysis Report 306, Manchester Centre for Computational Mathematics, Manchester, England, August 1997. 20 pp. To appear in *BIT*, 39(1): 1999.
- [CH97b] Anthony J. Cox and Nicholas J. Higham. Stability of Householder  $QR$  factorization for weighted least squares problems. Numerical Analysis Report 301, Manchester Centre for Computational Mathematics, Manchester, England, February 1997. 17 pp. To appear in *Numerical Analysis 1997, Proceedings of the 17th Dundee Conference*.
- [CH98a] Sheung Hun Cheng and Nicholas J. Higham. A modified Cholesky algorithm based on a symmetric indefinite factorization. *SIAM J. Matrix Anal. Appl.*, 19(4): 1097–1110, October 1998. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/30289>.
- [CH98b] Sheung Hun Cheng and Nicholas J. Higham. The nearest definite pair for the Hermitian generalized eigenvalue problem. Numerical Analysis Report 325, Manchester Centre for Computational Mathematics, Manchester, England, May 1998. 15 pp. Submitted to *Linear Algebra and Appl.*
- [CH98c] Anthony J. Cox and Nicholas J. Higham. Backward error bounds for constrained least squares problems. Numerical Analysis Report 321, Manchester Centre for Computational Mathematics, Manchester, England, April 1998. 20 pp. Submitted to *BIT*.
- [CH98d] Anthony J. Cox and Nicholas J. Higham. Row-wise backward stable elimination methods for the equality constrained least squares problem. Numerical Analysis Report 319, Manchester Centre for Computational



- Mathematics, Manchester, England, March 1998. 18 pp. To appear in *SIAM J. Matrix Anal. Appl.* [CH99c]
- Cox:1998:SHQ**
- [CH98e] Anthony J. Cox and Nicholas J. Higham. Stability of Householder QR factorization for weighted least squares problems. In Higham et al. [HWG98], pages 57–73. ISBN 0-582-31261-2 (paperback). ISSN 0269-3674. LCCN QA297 .D85 1997. [CH00a]
- Cheng:1999:NDP**
- [CH99a] Sheung Hun Cheng and Nicholas J. Higham. The nearest definite pair for the Hermitian generalized eigenvalue problem. *Linear Algebra and Appl.*, 302-303(1–3):63–76, December 1, 1999. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). URL <http://www.elsevier.nl/gej-ng/10/30/19/117/25/30/abstract.html>; <http://www.elsevier.nl/gej-ng/10/30/19/117/25/30/article.pdf>. [CH00b]
- Cox:2000:RWB**
- [CH00b] Anthony J. Cox and Nicholas J. Higham. Row-wise backward stable elimination methods for the equality constrained least squares problem. *SIAM J. Matrix Anal. Appl.*, 21(1):313–326, January 2000. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/33595>.
- Cox:1999:ASN**
- Anthony J. Cox and Nicholas J. Higham. Accuracy and stability of the null space method for solving the equality constrained least squares problem. *BIT Numerical Mathematics*, 39(1):34–49, 1999. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic).
- Cheng:2000:ALM**
- Sheung Hun Cheng and Nicholas J. Higham. Approximating the logarithm of a matrix with variable accuracy. In Watson and Griffiths [WG00], page ?? ISBN 1-58488-020-1 (paperback). LCCN QA297 .D85 1999; QA297 .N825 2000; QA297 .N853 1999.
- Cox:2000:RWB**
- [CH00b] Anthony J. Cox and Nicholas J. Higham. Row-wise backward stable elimination methods for the equality constrained least squares problem. *SIAM J. Matrix Anal. Appl.*, 21(1):313–326, January 2000. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/33595>.
- Cheng:2001:ILB**
- [CH99b] A. J. Cox and N. J. Higham. Backward error bounds for constrained least squares problems. *BIT Numerical Mathematics*, 39(2):210–227, 1999. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic). [CH01a]
- [CH01a] S. Cheng and N. Higham. Implementation for LAPACK of a block algorithm for matrix 1-norm estimation. LAPACK Working Note 152, Department of Computer Science, University of Tennessee, Knoxville,

- Knoxville, TN 37996, USA, August 2001. URL <http://www.netlib.org/lapack/lawns/lawn152.pdf>; <http://www.netlib.org/lapack/lawnspdf/lawn152.pdf>. UT-CS-01-470, August 2001.
- [CH01b] Sheung Hun Cheng and Nicholas J. Higham. Parallel implementation of a block algorithm for matrix 1-norm estimation. *Lecture Notes in Computer Science*, 2150:568–??, 2001. CODEN LNCS9. ISSN 0302-9743 (print), 1611-3349 (electronic). URL <http://link.springer-ny.com/link/service/series/0558/bibs/2150/21500568.htm>; <http://link.springer-ny.com/link/service/series/0558/papers/2150/21500568.pdf>.
- [CH17] Erin Carson and Nicholas J. Higham. A new analysis of iterative refinement and its application to accurate solution of ill-conditioned sparse linear systems. *SIAM Journal on Scientific Computing*, 39(6):A2834–A2856, 2017. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic). URL <http://eprints.maths.manchester.ac.uk/2537/>.
- [CH18] Erin Carson and Nicholas J. Higham. Accelerating the solution of linear systems by iterative refinement in three pre-
- cisions. *SIAM Journal on Scientific Computing*, 40(2):A817–A847, 2018. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).
- [CH23] Michael P. Connolly and Nicholas J. Higham. Probabilistic rounding error analysis of Householder QR factorization. *SIAM J. Matrix Anal. Appl.*, 44(3):1146–1163, 2023. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <https://epubs.siam.org/doi/10.1137/22M1514817>.
- [CHKL01] Sheung Hun Cheng, Nicholas J. Higham, Charles S. Kenney, and Alan J. Laub. Approximating the logarithm of a matrix to specified accuracy. *SIAM J. Matrix Anal. Appl.*, 22(4):1112–1125, 2001. CODEN SJMAEL. ISSN 1095-7162.
- [CHM21] Michael P. Connolly, Nicholas J. Higham, and Theo Mary. Stochastic rounding and its probabilistic backward error analysis. *SIAM Journal on Scientific Computing*, 43(1):A566–A585, 2021. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).
- [CHP20] Erin Carson, Nicholas J. Higham, and Srikara Pranesh. Three-precision GMRES-based iterative refinement for least squares

problems. *SIAM Journal on Scientific Computing*, 42(6):A4063–A4083, 2020. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Dongarra:1990:ASL**

- [DDHD90] Jack J. Dongarra, Jeremy Du Croz, Sven Hammarling, and Iain Duff. Algorithm 679: A set of Level 3 Basic Linear Algebra Subprograms: Model implementation and test programs. *ACM Trans. Math. Software*, 16(1):18–28, March 1990. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <http://www.acm.org/pubs/citations/journals/toms/1990-16-1/p18-dongarra/>; <http://www.netlib.org/utk/people/JackDongarra/PAPERS/ALGORITHM-679-A-Set-of-Level-3-BLAS.pdf>. See also [Hig90e, DH92a, DDP94].

**Dayde:1994:PBI**

- [DDP94] Michael J. Daydé, Iain S. Duff, and Antoine Petit. A parallel block implementation of level-3 BLAS for MIMD vector processors. *ACM Trans. Math. Software*, 20(2):178–193, June 1994. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). See [DDHD90, Hig90e, DH92a].

**Dongarra:2020:NAH**

- [DGH20] Jack Dongarra, Laura Grigori, and Nicholas J. Higham. Numerical algorithms for high-performance computational sci-

ence. *Philosophical transactions of the Royal Society of London Series A*, 378(2166):20190066:1–20190066:18, 2020. ISSN 1364-503X (print), 1471-2962 (electronic).

**Demmel:1990:IEB**

- [DH90a] J. Demmel and N. Higham. Improved error bounds for underdetermined system solvers. LAPACK Working Note 23, Department of Computer Science, University of Tennessee, Knoxville, Knoxville, TN 37996, USA, August 1990. URL <http://www.netlib.org/lapack/lawns/lawn23.ps>; <http://www.netlib.org/lapack/lawnspdf/lawn23.pdf>. UT-CS-90-113, August 1990.

**Demmel:1990:SBA**

- [DH90b] J. Demmel and N. Higham. Stability of block algorithms with fast level 3 BLAS. LAPACK Working Note 22, Department of Computer Science, University of Tennessee, Knoxville, Knoxville, TN 37996, USA, July 1990. URL <http://www.netlib.org/lapack/lawns/lawn22.ps>; <http://www.netlib.org/lapack/lawnspdf/lawn22.pdf>. UT-CS-90-110, July 1990.

**DuCroz:1990:SMM**

- [DH90c] J. Du Croz and N. Higham. Stability of methods for matrix inversion. LAPACK Working Note 27, Department of Computer Science, University of Tennessee, Knoxville, Knoxville,

TN 37996, USA, October 1990.  
 URL <http://www.netlib.org/lapack/lawns/lawn27.ps>;  
<http://www.netlib.org/lapack/lawnspdf/lawn27.pdf>. UT-CS-90-119, October, 1990.

**Demmel:1992:SBA**

- [DH92a] James W. Demmel and Nicholas J. Higham. Stability of block algorithms with fast level-3 BLAS. *ACM Trans. Math. Software*, 18(3):274–291, September 1992. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <http://www.acm.org/pubs/citations/journals/toms/1992-18-3/p274-demmel/>. See [DDHD90, Hig90e, DDP94].

**DuCroz:1992:SMM**

- [DH92b] Jeremy J. Du Croz and Nicholas J. Higham. Stability of methods for matrix inversion. *IMA Journal of Numerical Analysis*, 12(1):1–19, 1992. CODEN IJNADH. ISSN 0272-4979 (print), 1464-3642 (electronic).

**Demmel:1993:IEB**

- [DH93] James W. Demmel and Nicholas J. Higham. Improved error bounds for underdetermined system solvers. *SIAM J. Matrix Anal. Appl.*, 14(1):1–14, January 1993. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Davies:2000:NSG**

- [DH00] Philip I. Davies and Nicholas J. Higham. Numerically stable gen-

eration of correlation matrices and their factors. *BIT Numerical Mathematics*, 40(4):640–651, December 2000. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic). URL <http://www.springerlink.com/openurl.asp?genre=article&issn=0006-3835&volume=40&issue=4&spage=640>.

**Davies:2003:SPA**

[DH03] Philip I. Davies and Nicholas J. Higham. A Schur–Parlett algorithm for computing matrix functions. *SIAM J. Matrix Anal. Appl.*, 25(2):464–485, April 2003. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/41081>.

**Davies:2005:CMF**

[DH05] Philip I. Davies and Nicholas J. Higham. Computing  $f(A)b$  for matrix functions  $f$ . In Artan Boriçi et al., editors, *QCD and numerical analysis III. Proceedings of the third international workshop on numerical analysis and lattice QCD, Edinburgh, UK, June 30–July 4, 2003*, volume 47 of *Lecture Notes in Computational Science and Engineering*, pages 15–24. Springer-Verlag, New York, 2005.

**Dingle:2013:RIT**

[DH13] Nicholas J. Dingle and Nicholas J. Higham. Reducing the influence of tiny normwise relative

- errors on performance profiles. *ACM Trans. Math. Software*, 39(4):24:1–24:11, July 2013. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). [DHT01]
- [DH16] Edvin Deadman and Nicholas J. Higham. Testing matrix function algorithms using identities. *ACM Trans. Math. Software*, 42(1):4:1–4:15, February 2016. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic).
- [DHS92] James Demmel, Nick Higham, and Rob Schreiber. Block LU factorization. LAPACK Working Note 40, Department of Computer Science, University of Tennessee, Knoxville, Tennessee, TN 37996, USA, February 1992. URL <http://www.netlib.org/lapack/lawns/lawn40.ps>; <http://www.netlib.org/lapack/lawnspdf/lawn40.pdf>. UT-CS-92-149, February 1992.
- [DHS95] James W. Demmel, Nicholas J. Higham, and Robert S. Schreiber. Stability of block *LU* factorization. *Numerical Linear Algebra with Applications*, 2(2):173–190, 1995. CODEN NLAAEM. ISSN 1070-5325 (print), 1099-1506 (electronic). To appear. [FH18a]
- [Davies:2001:ACM] Philip I. Davies, Nicholas J. Higham, and Françoise Tisseur. Analysis of the Cholesky method with iterative refinement for solving the symmetric definite generalized eigenproblem. *SIAM J. Matrix Anal. Appl.*, 23(2):472–493, 2001. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/37349>.
- [Duff:1997:SAN] Iain S. Duff and G. Alistair Watson, editors. *The state of the art in numerical analysis*, volume 63 of *The Institute of Mathematics and Its Applications conference series: new series*. Oxford University Press, Walton Street, Oxford OX2 6DP, UK, 1997. ISBN 0-19-850014-9. LCCN QA297.S775 1997. URL <https://global.oup.com/academic/product/the-state-of-the-art-in-numerical-analysis-9780198500148>. Based on the proceedings of a conference on the state of the art in numerical analysis. Organized by the Institute of Mathematics and Its Applications and held at York University in April 1996.
- [Fasi:2018:MAC] Massimiliano Fasi and Nicholas J. Higham. Multiprecision algorithms for computing the matrix logarithm. *SIAM J. Matrix Anal. Appl.*, 39(1):472–491, 2018. CODEN SJMAEL. ISSN

- 0895-4798 (print), 1095-7162 (electronic). **Fasi:2015:AML**
- [FH18b] T. L. Freeman and Nicholas J. Higham. Joan E. Walsh FIMA (1932–2017). *Mathematics Today*, 54(3):89, 2018. ISSN 1361-2042. **Freeman:2018:JWF**
- [FH19] Massimiliano Fasi and Nicholas J. Higham. An arbitrary precision scaling and squaring algorithm for the matrix exponential. *SIAM J. Matrix Anal. Appl.*, 40(4):1233–1256, 2019. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). **Fasi:2019:APS**
- [FH21a] Massimiliano Fasi and Nicholas J. Higham. Generating extreme-scale matrices with specified singular values or condition number. *SIAM Journal on Scientific Computing*, 43(1):A663–A684, 2021. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic). **Fasi:2021:GES**
- [FH21b] Massimiliano Fasi and Nicholas J. Higham. Matrices with tunable infinity-norm condition number and no need for pivoting in  $LU$  factorization. *SIAM J. Matrix Anal. Appl.*, 42(1):417–435, 2021. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). **Fasi:2021:MTI**
- [FHI15] Massimiliano Fasi, Nicholas J. Higham, and Bruno Iannazzo. An algorithm for the matrix Lambert  $W$  function. *SIAM J. Matrix Anal. Appl.*, 36(2):669–685, 2015. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). **Fasi:2015:AML**
- [FHL23a] Massimiliano Fasi, Nicholas J. Higham, and Xiaobo Liu. Computing the square root of a low-rank perturbation of the scaled identity matrix. *SIAM J. Matrix Anal. Appl.*, 44(1):156–174, 2023. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <https://epubs.siam.org/doi/10.1137/22M1471559>. **Fasi:2023:CSR**
- [FHL<sup>+</sup>23b] Massimiliano Fasi, Nicholas J. Higham, Florent Lopez, Theo Mary, and Mantas Mikaitis. Matrix multiplication in multiword arithmetic: Error analysis and application to GPU tensor cores. *SIAM Journal on Scientific Computing*, 45(1):C1–C19, 2023. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic). URL <https://epubs.siam.org/doi/10.1137/21M1465032>. **Fasi:2023:MMM**
- [FHMP21] Massimiliano Fasi, Nicholas J. Higham, Mantas Mikaitis, and Srihara Pranesh. Numerical behavior of NVIDIA tensor cores. **Fasi:2021:NBN**

*PeerJ Computer Science*, 7: e330:1–e330:19, February 2021. ISSN 2376-5992.

**Fischer:2017:AAM**

- [Fis17] Thomas M. Fischer. On the algorithm by Al-Mohy and Higham for computing the action of the matrix exponential: a posteriori roundoff error estimation. *Linear Algebra and Appl.*, 531(??):141–168, October 15, 2017. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). URL <http://www.sciencedirect.com/science/article/pii/S0024379517303427>. See [AMH11].

**Graham:2004:UAC**

- [GH04] Ivan Graham and Nicholas J. Higham. UKIE applied/computational mathematicians greet the year in Sheffield, Manchester. *SIAM News*, 37(4):12, May 2004. ISSN 0036-1437.

**Guo:2006:SNM**

- [GH06] Chun-Hua Guo and Nicholas J. Higham. A Schur–Newton method for the matrix  $p$ th root and its inverse. *SIAM J. Matrix Anal. Appl.*, 28(3):788–804, January 2006. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Guo:2007:ISN**

- [GH07] Chun-Hua Guo and Nicholas J. Higham. Iterative solution of a nonsymmetric algebraic Riccati equation. *SIAM J. Matrix Anal. Appl.*, 29(2):396–412,

???? 2007. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Georgescu:2018:ESC**

[GHP18] Dan I. Georgescu, Nicholas J. Higham, and Gareth W. Peters. Explicit solutions to correlation matrix completion problems, with an application to risk management and insurance. *Royal Society Open Science*, 5(3):172348:1–172348:11, March 2018. CODEN RSOSAV. ISSN 2054-5703.

**Guo:2008:DSH**

[GHT08] Chun-Hua Guo, Nicholas J. Higham, and Françoise Tisseur. Detecting and solving hyperbolic quadratic eigenvalue problems. *SIAM J. Matrix Anal. Appl.*, 30(4):1593–1613, 2008. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Guo:2009:DSH**

[GHT09a] Chun-Hua Guo, Nicholas J. Higham, and Françoise Tisseur. Detecting and solving hyperbolic quadratic eigenvalue problems. *SIAM J. Matrix Anal. Appl.*, 30(4):1593–1613, ??? 2009. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Guo:2009:IAA**

[GHT09b] Chun-Hua Guo, Nicholas J. Higham, and Françoise Tisseur. An improved arc algorithm for detecting definite Hermitian pairs. *SIAM J. Matrix Anal. Appl.*, 31(3):1131–1151, 2009.

CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Guo:2010:IAA**

- [GHT10] Chun-Hua Guo, Nicholas J. Higham, and Françoise Tisseur. An improved arc algorithm for detecting definite Hermitian pairs. *SIAM J. Matrix Anal. Appl.*, 31(3):1131–1151, 2010. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Grammont:2011:FAN**

- [GHT11] Laurence Grammont, Nicholas J. Higham, and Françoise Tisseur. A framework for analyzing nonlinear eigenproblems and parametrized linear systems. *Linear Algebra and Appl.*, 435(3):623–640, August 1, 2011. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).

**Higham:2010:CMF**

- [HAM10] Nicholas J. Higham and Awad H. Al-Mohy. Computing matrix functions. *Acta Numerica*, 19:159–208, 2010. CODEN ANUMFU. ISBN 0-521-19284-6. ISSN 0962-4929 (print), 1474-0508 (electronic).

**Haidar:2020:MPI**

- [HBT<sup>+</sup>20] Azzam Haidar, Harun Bayraktar, Stanimire Tomov, Jack Dongarra, and Nicholas J. Higham. Mixed-precision iterative refinement using tensor cores on GPUs to accelerate solution of

linear systems. *Proceedings of the Royal Society of London. Series A*, 476(2243):20200110:1–2020011030, 2020. CODEN PRLAAZ. ISSN 1364-5021 (print), 1471-2946 (electronic).

**Higham:1996:MIM**

- [HC96] Nicholas J. Higham and Sheung Hun Cheng. Modifying the inertia of matrices arising in optimization. Numerical Analysis Report 295, Manchester Centre for Computational Mathematics, Manchester, England, September 1996. 17 pp. To appear in *Linear Algebra and Appl.*

**Higham:1998:MIM**

- [HC98] Nicholas J. Higham and Sheung Hun Cheng. Modifying the inertia of matrices arising in optimization. *Linear Algebra and Appl.*, 275-276:261–279, 1998. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).

**Higham:2015:PCA**

- [HDG<sup>+</sup>15] Nicholas J. Higham, Mark R. Dennis, Paul Glendinning, Paul A. Martin, Fadil Santosa, and Jared Tanner, editors. *The Princeton Companion to Applied Mathematics*. Princeton University Press, Princeton, NJ, USA, 2015. ISBN 0-691-15039-7 (hardcover). xvii + 3 + 994 + 16 pp. LCCN QA155 .P75 2015. URL <http://press.princeton.edu/titles/10592.html>.



- Higham:2017:CHB**
- [HF17] Nicholas J. Higham and Neville J. Ford. Christopher T. H. Baker (1939–2017). *Mathematics Today*, 53(6):257, 2017. ISSN 1361-2042. [HH96b]
- Higham:1989:LGF**
- [HH89] Nicholas J. Higham and Desmond J. Higham. Large growth factors in Gaussian elimination with pivoting. *SIAM J. Matrix Anal. Appl.*, 10(2):155–164, April 1989. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). [HH98]
- Higham:1992:BEC**
- [HH92a] Desmond J. Higham and Nicholas J. Higham. Backward error and condition of structured linear systems. *SIAM J. Matrix Anal. Appl.*, 13(1):162–175, January 1992. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). [HH99]
- Higham:1992:CPT**
- [HH92b] Desmond J. Higham and Nicholas J. Higham. Componentwise perturbation theory for linear systems with multiple right-hand sides. *Linear Algebra and Appl.*, 174:111–129, 1992. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).
- Hammarling:1996:HPP**
- [HH96a] Sven Hammarling and Nicholas J. Higham. How to prepare a poster. *SIAM News*, 29(4):20, 19, May 1996. ISSN 0036-1437. [HH00]
- Higham:1996:SBE**
- Desmond J. Higham and Nicholas J. Higham. Structured backward error and condition of generalized eigenvalue problems. Numerical Analysis Report 297, Manchester Centre for Computational Mathematics, Manchester, England, November 1996. 24 pp. Submitted to *SIAM J. Matrix Anal. Appl.*
- Higham:1998:SBE**
- Desmond J. Higham and Nicholas J. Higham. Structured backward error and condition of generalized eigenvalue problems. *SIAM J. Matrix Anal. Appl.*, 20(2):493–512, 1998. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/31318>.
- Higham:1999:SBE**
- Desmond J. Higham and Nicholas J. Higham. Structured backward error and condition of generalized eigenvalue problems. *SIAM J. Matrix Anal. Appl.*, 20(2):493–512, April 1999. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/31318>.
- Higham:2000:MG**
- Desmond J. Higham and Nicholas J. Higham. *MATLAB Guide*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 2000. ISBN 0-89871-469-

9. xxii + 283 pp. LCCN QA297 .H5217 2000.
- [HH05a] Gareth I. Hargreaves and Nicholas J. Higham. Efficient algorithms for the matrix cosine and sine. *Numerical Algorithms*, 40(4):383–400, 2005. CODEN NUALEG. ISSN 1017-1398 (print), 1572-9265 (electronic).
- [HHK93] Sven Hammarling, Nicholas J. Higham, and Bo Kågström. CERFACS hosts workshop on reliability of computations. *SIAM News*, 26:4, July 1993. ISSN 0036-1437.
- [HH05b] Desmond J. Higham and Nicholas J. Higham. *MATLAB guide*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, second edition, 2005. ISBN 0-89871-578-4. xxiv + 382 pp. LCCN QA297 .H5217 2005.
- [HH17] Desmond J. Higham and Nicholas J. Higham. *MATLAB guide*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 2017. ISBN 1-61197-465-8. xxvi + 476 pp.
- [HH19] Sven J. Hammarling and Nicholas J. Higham. Celebrating James Hardy Wilkinson. *Mathematics Today*, 55(4):131, 2019. ISSN 1361-2042.
- [HH22] Sven Hammarling and Nicholas J. Higham. The influence and contribution of Jack Dongarra to numerical linear algebra. *Computing in Science and Engineering*, 24(4):6–11, July/August 2022. CODEN CSENF. ISSN 1521-9615 (print), 1558-366X (electronic).
- [HHL01] Nicholas J. Higham, Roger Horn, and Thomas J. Laffey, editors. *Proceedings of the Eighth Conference of the International Linear Algebra Society*. Elsevier Science Publishers B.V., Amsterdam, The Netherlands, 2001. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). Held at the Universitat Politècnica de Catalunya, Barcelona, July 19–22, 1999, *Linear Algebra Appl.* **332/334** (2001).

**Hargreaves:2005:EAM****Hammarling:1993:CHW****Higham:2005:MG****Higham:2001:PEC****Higham:2017:MG****Hammarling:2019:CJH****Higham:2001:P****Hammarling:2022:ICJ**

- [HHP21] **Higham:2021:RMG**  
Desmond J. Higham, Nicholas J. Higham, and Srihara Pranesh. Random matrices generating large growth in  $LU$  factorization with pivoting. *SIAM J. Matrix Anal. Appl.*, 42(1):185–201, 2021. CODEN SJ-MAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- [HHT08] **Hale:2008:CRM**  
Nicholas Hale, Nicholas J. Higham, and Lloyd N. Trefethen. Computing  $\mathbf{A}^\alpha$ ,  $\log(\mathbf{A})$ , and related matrix functions by contour integrals. *SIAM Journal on Numerical Analysis*, 46(5):2505–2523, 2008. CODEN SJ-NAAM. ISSN 0036-1429 (print), 1095-7170 (electronic).
- [Hig83a] **Higham:1983:MCN**  
N. J. Higham. Matrix condition numbers. M.Sc. Thesis, University of Manchester, Manchester, England, October 1983. iv + 86 pp.
- [Hig83b] **Higham:1983:UBC**  
Nicholas J. Higham. Upper bounds for the condition number of a triangular matrix. Numerical Analysis Report 86, University of Manchester, Manchester, England, May 1983.
- [Hig85a] **Higham:1985:MCB**  
Nicholas J. Higham. Matrix computations in Basic on a microcomputer. Numerical Analysis Report 101, Department of Mathematics, University of Manchester, Manchester, M13 9PL, UK, June 1985. 62 pp.
- [Hig85b] **Higham:1985:NPN**  
Nicholas J. Higham. *Nearness Problems in Numerical Linear Algebra*. PhD thesis, University of Manchester, Manchester, England, July 1985. 173 pp.
- [Hig86a] **Higham:1986:CPD**  
Nicholas J. Higham. Computing the polar decomposition— with applications. *SIAM Journal on Scientific and Statistical Computing*, 7(4):1160–1174, October 1986. CODEN SIJCD4. ISSN 0196-5204.
- [Hig86b] **Higham:1986:EAC**  
Nicholas J. Higham. Efficient algorithms for computing the condition number of a tridiagonal matrix. *SIAM Journal on Scientific and Statistical Computing*, 7(1):150–165, 1986. CODEN SIJCD4. ISSN 0196-5204.
- [Hig86c] **Higham:1986:MCB**  
Nicholas J. Higham. Matrix computations in Basic on a microcomputer. *IMA Bulletin*, 22:13–20, 1986.
- [Hig86d] **Higham:1986:NMM**  
Nicholas J. Higham. Newton’s method for the matrix square root. *Math. Comp.*, 46(174):537–549, April 1986. CODEN MCMPAF. ISSN 0025-5718 (print), 1088-6842 (electronic).

- [Hig87a] **Higham:1987:CRS** Nicholas J. Higham. Computing real square roots of a real matrix. *Linear Algebra and Appl.*, 88/89: 405–430, 1987. CODEN LAA-PAW. ISSN 0024-3795 (print), 1873-1856 (electronic).
- [Hig87b] **Higham:1987:EAB** Nicholas J. Higham. Error analysis of the Björck–Pereyra algorithms for solving Vandermonde systems. *Numer. Math.*, 50(5):613–632, 1987. CODEN NUMMA7. ISSN 0029-599X (print), 0945-3245 (electronic).
- [Hig87c] **Higham:1987:SCN** Nicholas J. Higham. A survey of condition number estimation for triangular matrices. *SIAM Review*, 29(4):575–596, December 1987. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic).
- [Hig88a] **Higham:1988:AFC** Nicholas J. Higham. Algorithm 674: FORTRAN codes for estimating the one-norm of a real or complex matrix, with applications to condition estimation. *ACM Trans. Math. Software*, 14(4):381–396, December 1988. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <http://www.acm.org/pubs/citations/journals/toms/1988-14-4/p381-higham/>; <http://www.acm.org/pubs/toc/Abstracts/0098-3500/214386.html>. See also [Hig89c].
- [Hig88b] **Higham:1988:CNS** Nicholas J. Higham. Computing a nearest symmetric positive semidefinite matrix. *Linear Algebra and Appl.*, 103:103–118, 1988. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).
- [Hig88c] **Higham:1988:FSV** Nicholas J. Higham. Fast solution of Vandermonde-like systems involving orthogonal polynomials. *IMA Journal of Numerical Analysis*, 8(4):473–486, October 1988. CODEN IJ-NADH. ISSN 0272-4979 (print), 1464-3642 (electronic).
- [Hig88d] **Higham:1988:SPP** Nicholas J. Higham. The symmetric Procrustes problem. *BIT*, 28(1):133–143, 1988. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic).
- [Hig89a] **Higham:1989:AST** Nicholas J. Higham. The accuracy of solutions to triangular systems. *SIAM Journal on Numerical Analysis*, 26(5): 1252–1265, October 1989. CODEN SJNAAM. ISSN 0036-1429 (print), 1095-7170 (electronic).
- [Hig89b] **Higham:1989:CTM** Nicholas J. Higham. A collection of test matrices in MATLAB. Numerical Analysis Report 172, University of Manchester, Manchester, England, July 1989.

**Higham:1989:CFC**

- [Hig89c] Nicholas J. Higham. Corrigendum: “Algorithm 674: FORTRAN codes for estimating the one-norm of a real or complex matrix, with applications to condition estimation”. *ACM Trans. Math. Software*, 15(2): 168, June 1989. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <http://www.acm.org/pubs/citations/journals/toms/1989-15-2/p168-higham/>; <http://www.acm.org/pubs/toc/Abstracts/0098-3500/214391.html>. See [Hig88a].

**Higham:1989:MCP**

- [Hig89d] Nicholas J. Higham. Matrix computations on a PC. *SIAM News*, 22:16, January 1989. ISSN 0036-1437.

**Higham:1989:MNP**

- [Hig89e] Nicholas J. Higham. Matrix nearness problems and applications. In M. J. C. Gover and S. Barnett, editors, *Applications of Matrix Theory*, pages 1–27. Oxford University Press, Walton Street, Oxford OX2 6DP, UK, 1989.

**Higham:1990:ACD**

- [Hig90a] Nicholas J. Higham. Analysis of the Cholesky decomposition of a semi-definite matrix. In M. G. Cox and S. J. Hammarling, editors, *Reliable Numerical Computation*, pages 161–185. Oxford University Press, Walton Street, Oxford OX2 6DP, UK, 1990.

**Higham:1990:BEG**

- [Hig90b] Nicholas J. Higham. Bounding the error in Gaussian elimination for tridiagonal systems. *SIAM J. Matrix Anal. Appl.*, 11(4):521–530, October 1990. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:1990:CEB**

- [Hig90c] Nicholas J. Higham. Computing error bounds for regression problems. In Philip J. Brown and Wayne A. Fuller, editors, *Statistical Analysis of Measurement Error Models and Applications, Contemporary Mathematics 112*, pages 195–208. American Mathematical Society, Providence, RI, USA, 1990.

**Higham:1990:EMN**

- [Hig90d] Nicholas J. Higham. Experience with a matrix norm estimator. *SIAM Journal on Scientific and Statistical Computing*, 11(4):804–809, July 1990. CODEN SIJCD4. ISSN 0196-5204.

**Higham:1990:EFM**

- [Hig90e] Nicholas J. Higham. Exploiting fast matrix multiplication within the level 3 BLAS. *ACM Trans. Math. Software*, 16(4):352–368, December 1990. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <http://www.acm.org/pubs/citations/journals/toms/1990-16-4/p352-higham/>. Describes algorithms based on Strassen’s method which are asymptotically faster than the

standard  $N^3$  algorithm, and in practice, faster for  $N \approx 100$ , and examines their numerical stability. See [DDHD90, DH92a].

**Higham:1990:HAG**

- [Hig90f] Nicholas J. Higham. How accurate is Gaussian elimination? In D. F. Griffiths and G. A. Watson, editors, *Numerical Analysis 1989, Proceedings of the 13th Dundee Conference*, volume 228 of *Pitman Research Notes in Mathematics*, pages 137–154. Longman Scientific and Technical, Essex, UK, 1990.

**Higham:1990:FMM**

- [Hig90g] Nicholas J. Higham. Is fast matrix multiplication of practical use? *SIAM News*, 23:12–??, November 1990. ISSN 0036-1437.

**Higham:1990:IRE**

- [Hig90h] Nicholas J. Higham. Iterative refinement enhances the stability of  $QR$  factorization methods for solving linear equations. Numerical Analysis Report 182, University of Manchester, Manchester, England, April 1990.

**Higham:1990:RGH**

- [Hig90i] Nicholas J. Higham. Review of “G. H. Golub and C. F. Van Loan, *Matrix Computations*, Second Edition, Johns Hopkins University Press, Baltimore, Maryland, 1989”. *Linear Algebra and Appl.*, 141:289–292, 1990. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).

**Higham:1990:RMJ**

- [Hig90j] Nicholas J. Higham. Review of “M. J. C. Gover and S. Barnett, eds., *Applications of Matrix Theory*, Oxford University Press, 1989”. *Mathematical Gazette*, 74(468):202, 1990. CODEN MAGAAS. ISSN 0025-5572 (print), 2056-6328 (electronic).

**Higham:1990:SA A**

- [Hig90k] Nicholas J. Higham. Stability analysis of algorithms for solving confluent Vandermonde-like systems. *SIAM J. Matrix Anal. Appl.*, 11(1):23–41, January 1990. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:1991:ACT**

- [Hig91a] Nicholas J. Higham. Algorithm 694: A collection of test matrices in MATLAB. *ACM Trans. Math. Software*, 17(3):289–305, September 1991. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <http://www.acm.org/pubs/citations/journals/toms/1991-17-3/p289-higham/>.

**Higham:1991:IRE**

- [Hig91b] Nicholas J. Higham. Iterative refinement enhances the stability of  $QR$  factorization methods for solving linear equations. *BIT*, 31(3):447–468, 1991. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic).

**Higham:1991:SLE**

- [Hig91c] Nicholas J. Higham. Solving linear equations. In Christine Bondi, editor, *New Applications of Mathematics*, pages 33–56. Penguin, London, 1991.

**Higham:1991:TMP**

- [Hig91d] Nicholas J. Higham. Three measures of precision in floating point arithmetic. *NA Digest*, 91(16), 1991. Electronic mail magazine: [na.help@na-net.ornl.gov](mailto:na.help@na-net.ornl.gov).

**Higham:1992:EMN**

- [Hig92a] Nicholas J. Higham. Estimating the matrix  $p$ -norm. *Numer. Math.*, 62:539–555, 1992. CODEN NUMMA7. ISSN 0029-599X (print), 0945-3245 (electronic).

**Higham:1992:IWP**

- [Hig92b] Nicholas J. Higham. IMA workshop participants Fête Golub on 60th birthday. *SIAM News*, 25:3–??, May 1992. ISSN 0036-1437.

**Higham:1992:JAF**

- [Hig92c] Nicholas J. Higham. The joy of anonymous FTP. *IMA Numerical Analysis Newsletter*, 17(1):61–64, October 1992.

**Higham:1992:LRM**

- [Hig92d] Nicholas J. Higham. LAPACK released in March. *SIAM News*, 25:20, May 1992. ISSN 0036-1437.

**Higham:1992:SMM**

- [Hig92e] Nicholas J. Higham. Stability of a method for multiplying complex matrices with three real matrix multiplications. *SIAM J. Matrix Anal. Appl.*, 13(3):681–687, July 1992. CODEN SJ-MAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:1992:PTB**

- [Hig92f] Nick Higham. Perturbation theory and backward error for  $AX - XB = C$ . LAPACK Working Note 42, Department of Computer Science, University of Tennessee, Knoxville, Knoxville, TN 37996, USA, April 1992. URL <http://www.netlib.org/lapack/lawns/lawn42.ps>; <http://www.netlib.org/lapack/lawnspdf/lawn42.pdf>. UT-CS-92-153, April, 1992.

**Higham:1993:AFP**

- [Hig93a] Nicholas J. Higham. The accuracy of floating point summation. *SIAM Journal on Scientific Computing*, 14(4):783–799, July 1993. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic). URL <http://citeseer.nj.nec.com/higham93accuracy.html>; <http://citeseer.nj.nec.com/rd/4651150%2C296147%2C1%2C0.25%2CDownload/http%253A%252F%252Fciteseer.nj.nec.com/cache/papers2/cs/14280/http%253AzSzzSzw.w.maths.man.ac.ukzSz%257EnareportszSznarep198.pdf/higham93accuracy.pdf>;

- <http://citeseer.nj.nec.com/rd/4651150%2C296147%2C1%2C0.25%2CDownload/http%253A%252F%252Fwww.maths.man.ac.uk/%257Enareports/narep198.ps.gz>.
- [Hig93b] Nicholas J. Higham. Commentary on C. Lanczos, “Introduction” to “Tables of Chebyshev Polynomials  $S_n(x)$  and  $C_n(x)$ ”, Nat. Bur. Stand., Appl. Math. Series 9, 1952, v–xxvi. In M. Chu et al., editors, *The Lanczos Collected Papers with Commentaries*. ????, ????, 1993. To appear.
- [Hig93c] Nicholas J. Higham. *Handbook of Writing for the Mathematical Sciences*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, June 1993. ISBN 0-89871-314-5. xii + 241 pp. LCCN QA42.H54 1993. US\$21.50.
- [Hig93d] Nicholas J. Higham. Optimization by direct search in matrix computations. *SIAM J. Matrix Anal. Appl.*, 14(2):317–333, April 1993. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- [Hig93e] Nicholas J. Higham. Perturbation theory and backward error analysis for  $AX - XB = C$ . *BIT*, 33(1):124–136, 1993. CODEN BITTEL, NBITAB. ISSN 0006-3835 (print), 1572-9125 (electronic). URL <http://www.mai.liu.se/BIT/contents/bit33.html>.
- [Hig93f] Nicholas J. Higham. Perturbation theory and backward error for  $AX - XB = C$ . In Moonen et al. [MGD93], pages 391–392. ISBN 0-7923-2151-0. LCCN QA185.D37 L56 1993. URL <http://catdir.loc.gov/catdir/enhancements/fy0823/92046135-d.html>; <http://www.gbv.de/dms/hbz/toc/ht004938330.pdf>; <http://zbmath.org/?q=an:0810.00029>.
- [Hig93g] Nicholas J. Higham. The Test Matrix Toolbox for Matlab. Numerical Analysis Report 237, Manchester Centre for Computational Mathematics, Manchester, England, December 1993. 76 pp.
- [Hig94a] Nicholas J. Higham. BibTeX: A versatile tool for L<sup>A</sup>T<sub>E</sub>X users. *SIAM News*, 27:10, 11, 19, January 1994. ISSN 0036-1437.
- [Hig94b] Nicholas J. Higham. *Handbook of Writing for the Mathematical Sciences*. Nippon Hyoron Sha, Tokyo, 1994. ISBN 4-535-78211-3. x + 235 pp. Japanese edition of [Hig93c], translated by Shoji Okumura and Takemitsu Hasegawa.



- [Hig94c] **Higham:1994:MSD**  
 Nicholas J. Higham. The matrix sign decomposition and its relation to the polar decomposition. *Linear Algebra and Appl.*, 212/213:3–20, 1994. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).
- [Hig94d] **Higham:1994:SCPa**  
 Nicholas J. Higham. A survey of componentwise perturbation theory in numerical linear algebra. Numerical Analysis Report 241, University of Manchester, Manchester, England, February 1994. To appear in *Mathematics of Computation 1943–1993*, W. Gautschi, ed. Proceedings of Symposia in Applied Mathematics, American Mathematical Society.
- [Hig94e] **Higham:1994:SCPb**  
 Nicholas J. Higham. A survey of componentwise perturbation theory in numerical linear algebra. In Walter Gautschi, editor, *Mathematics of Computation 1943–1993: A Half Century of Computational Mathematics*, volume 48 of *Proceedings of Symposia in Applied Mathematics*, pages 49–77. American Mathematical Society, Providence, RI, USA, 1994.
- [Hig94f] **Higham:1994:WDM**  
 Nicholas J. Higham. Which dictionary for the mathematical scientist? *IMA Bulletin*, 30(5/6): 81–88, 1994.
- [Hig95a] **Higham:1995:IRLb**  
 N. J. Higham. Iterative refinement and LAPACK. LAPACK Working Note 104, Department of Computer Science, University of Tennessee, Knoxville, Knoxville, TN 37996, USA, October 1995. URL <http://www.netlib.org/lapack/lawns/lawn104.ps>; <http://www.netlib.org/lapack/lawnspdf/lawn104.pdf>. UT-CS-95-308, October 1995.
- [Hig95b] **Higham:1995:SDP**  
 N. J. Higham. Stability of the diagonal pivoting method with partial pivoting. LAPACK Working Note 105, Department of Computer Science, University of Tennessee, Knoxville, Knoxville, TN 37996, USA, October 1995. URL <http://www.netlib.org/lapack/lawns/lawn105.ps>; <http://www.netlib.org/lapack/lawnspdf/lawn105.pdf>. UT-CS-95-309, October 1995.
- [Hig95c] **Higham:1995:DPS**  
 Nicholas J. Higham. Diagonal pivoting stability . . . . Numerical Analysis Report 2xx, University of Manchester, Manchester, England, June 1995. In preparation.
- [Hig95d] **Higham:1995:IRLa**  
 Nicholas J. Higham. Iterative refinement for linear systems and LAPACK. Numerical Analysis Report 277, Manchester Centre for Computational Mathematics, Manchester, England,

September 1995. 17 pp. To appear in *IMA Journal of Numerical Analysis* (14) 1997.

**Higham:1995:RHA**

[Hig95e] Nicholas J. Higham. Review of “Howard Anton and Chris Rorres, *Elementary Linear Algebra: Applications Version*, Seventh edition, Wiley, New York, 1994.”. *IMA Bulletin*, 31(7/8): 122–123, 1995.

**Higham:1995:SPT**

[Hig95f] Nicholas J. Higham. Stability of parallel triangular system solvers. *SIAM Journal on Scientific Computing*, 16(2):400–413, March 1995. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:1995:TMT**

[Hig95g] Nicholas J. Higham. The Test Matrix Toolbox for MATLAB, version 3.0. Numerical Analysis Report 276, Manchester Centre for Computational Mathematics, Manchester, England, September 1995. 70 pp. URL [http://p2chpd-cluster.univ-lyon1.fr/P2CHPD/matlab/pdf\\_doc/otherdocs/testmatrix.pdf](http://p2chpd-cluster.univ-lyon1.fr/P2CHPD/matlab/pdf_doc/otherdocs/testmatrix.pdf). Supersedes Numerical Analysis Report No. 237. In preparation.

**Higham:1996:ASN**

[Hig96a] Nicholas J. Higham. *Accuracy and Stability of Numerical Algorithms*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 1996.

ISBN 0-89871-355-2 (paperback). xxviii + 688 pp. LCCN QA297.H53 1996. US\$39.00. URL <http://www.ma.man.ac.uk/~higham/asna.html>.

**Higham:1996:CCL**

[Hig96b] Nicholas J. Higham. Commentary on C. Lanczos, “Introduction” to “Tables of Chebyshev Polynomials  $S_n(x)$  and  $C_n(x)$ ”, Nat. Bur. Stand., Appl. Math. Series 9, 1952, v–xxvi. In M. Chu et al., editors, *The Lanczos Collected Papers with Commentaries*, page ?? ???? , 1996. To appear.

**Higham:1996:FCS**

[Hig96c] Nicholas J. Higham. Factorizing complex symmetric matrices with positive definite real and imaginary parts. Numerical Analysis Report 298, Manchester Centre for Computational Mathematics, Manchester, England, November 1996. 12 pp. Published in [Hig98c].

**Higham:1996:RAN**

[Hig96d] Nicholas J. Higham. Review of “Acta Numerica 1994 and Acta Numerica 1995, Cambridge University Press”. *Mathematics Today*, 32(1/2):28–??, 1996. ISSN 1361-2042.

**Higham:1996:RMB**

[Hig96e] Nicholas J. Higham. Review of “Are Magnus Bruaset. A Survey of Preconditioned Iterative Methods, volume 328 of Pitman Research Notes in Mathematics.

Longman Scientific and Technical, Essex, UK, 1995.”. *IMA Bulletin*, 32(3/4):60, 1996.

**Higham:1996:RDB**

- [Hig96f] Nicholas J. Higham. Review of “Dario Bini and Victor Y. Pan. *Polynomial and Matrix Computations. Volume 1: Fundamental Algorithms*, Birkhäuser, 1994”. *Math. Comp.*, 65(214):888–889, 1996. CODEN MCM-PAF. ISSN 0025-5718 (print), 1088-6842 (electronic).

**Higham:1997:CCL**

- [Hig97a] Nicholas J. Higham. Commentary on C. Lanczos, “Introduction” to “Tables of Chebyshev Polynomials  $S_n(x)$  and  $C_n(x)$ ”, *Nat. Bur. Stand., Appl. Math. Series 9*, 1952, v–xxvi. In William R. Davis et al., editors, *Cornelius Lanczos Collected Published Papers with Commentaries*, volume VI(3), pages 557–559. ????, 1997. To appear.

**Higham:1997:IRL**

- [Hig97b] Nicholas J. Higham. Iterative refinement for linear systems and LAPACK. *IMA Journal of Numerical Analysis*, 17(4):495–509, October 1997. CODEN IJNADH. ISSN 0272-4979 (print), 1464-3642 (electronic). URL [http://www3.oup.co.uk/imanum/hdb/Volume\\_17/Issue\\_04/170495.sgm.abs.html](http://www3.oup.co.uk/imanum/hdb/Volume_17/Issue_04/170495.sgm.abs.html). Preprint published as Numerical Analysis Report 277, Manchester Centre

for Computational Mathematics, Manchester, England, and as LAPACK Working Note 104.

**Higham:1997:MHI**

- [Hig97c] Nicholas J. Higham. Manchester hosts inaugural meeting of UK and Irish SIAM Section. *SIAM News*, 30(3):3, April 1997. ISSN 0036-1437.

**Higham:1997:RDD**

- [Hig97d] Nicholas J. Higham. Recent developments in dense numerical linear algebra. In Duff and Watson [DW97], pages 1–26. ISBN 0-19-850014-9. LCCN QA297.S775 1997. URL <https://global.oup.com/academic/product/the-state-of-the-art-in-numerical-analysis-9780198500148>. Based on the proceedings of a conference on the state of the art in numerical analysis. Organized by the Institute of Mathematics and Its Applications and held at York University in April 1996.

**Higham:1997:RJR**

- [Hig97e] Nicholas J. Higham. Review of “James R. Schott, *Matrix Analysis for Statistics*, Wiley, 1997”. *Mathematics Today*, 33(5):161–162, 1997. ISSN 1361-2042.

**Higham:1997:SBF**

- [Hig97f] Nicholas J. Higham. Stability of block LDL<sup>T</sup> factorization of a symmetric tridiagonal matrix. Technical report, Manchester Centre for Computational Mathematics, Manchester, England, 1997. In preparation.

**Higham:1997:SDP**

[Hig97g] Nicholas J. Higham. Stability of the diagonal pivoting method with partial pivoting. *SIAM J. Matrix Anal. Appl.*, 18(1):52–65, January 1997. CODEN SJ-MAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:1997:SIMa**

[Hig97h] Nicholas J. Higham. Stable iterations for the matrix square root. Numerical Analysis Report 305, Manchester Centre for Computational Mathematics, Manchester, England, April 1997. 20 pp. Published in [Hig97i].

**Higham:1997:SIMb**

[Hig97i] Nicholas J. Higham. Stable iterations for the matrix square root. *Numerical Algorithms*, 15(2):227–242, 1997. CODEN NUALEG. ISSN 1017-1398 (print), 1572-9265 (electronic). URL <http://ipsapp007.kluweronline.com/content/getfile/5058/7/6/abstract.htm>; <http://ipsapp007.kluweronline.com/content/getfile/5058/7/6/fulltext.pdf>.

**Higham:1997:TLA**

[Hig97j] Nicholas J. Higham. Testing linear algebra software. In Ronald F. Boisvert, editor, *Quality of Numerical Software: Assessment and Enhancement*, pages 109–122. Chapman and Hall, London, 1997.

**Higham:1998:FCP**

[Hig98a] Nicholas J. Higham. *QR* factorization with complete pivoting and accurate computation of the SVD. Numerical Analysis Report 324, Manchester Centre for Computational Mathematics, Manchester, England, September 1998. 26 pp. Submitted to *Linear Algebra and Appl.*

**Higham:1998:BNR**

[Hig98b] Nicholas J. Higham. Book news & reviews: Review of “Christoph W. Ueberhuber, Numerical Computation: Methods, Software and Analysis, Springer-Verlag, 1997”. *IEEE Computational Science & Engineering*, 5(1):79, January/March 1998. CODEN IS-CEE4. ISSN 1070-9924 (print), 1558-190X (electronic). URL <http://dlib.computer.org/cs/books/cs1998/pdf/c1079.pdf>.

**Higham:1998:FCS**

[Hig98c] Nicholas J. Higham. Factorizing complex symmetric matrices with positive definite real and imaginary parts. *Math. Comp.*, 67(224):1591–1599, 1998. CODEN MCMPAF. ISSN 0025-5718 (print), 1088-6842 (electronic).

**Higham:1998:HWM**

[Hig98d] Nicholas J. Higham. *Handbook of Writing for the Mathematical Sciences*. Society for Industrial and Applied Mathematics,

Philadelphia, PA, USA, second edition, 1998. ISBN 0-89871-420-6 (paperback), 0-89871-955-0 (e-book). xvi + 302 pp. LCCN QA42 .H54 1998.

**Higham:1998:NAS**

[Hig98e] Nicholas J. Higham. Notes on accuracy and stability of algorithms in numerical linear algebra. Numerical Analysis Report 333, Manchester Centre for Computational Mathematics, Manchester, England, August 1998. 42 pp. To appear in proceedings of EPSRC Numerical Analysis Summer School, Leicester University, July 1998.

**Higham:1999:BRL**

[Hig99a] Nicholas J. Higham. Book review: *Linear Algebra (Pure and Applied Mathematics)*, by Peter D. Lax: 250 pp., £55.00, ISBN 0-471-11111-2 (John Wiley & Sons, 1996). *Bulletin of the London Mathematical Society*, 31(3):374–375, May 1999. CODEN LMSBBT. ISSN 0024-6093 (print), 1469-2120 (electronic). URL <http://blms.oxfordjournals.org/content/31/3/374.full.pdf>.

**Higham:1999:FBR**

[Hig99b] Nicholas J. Higham. Featured book review: Selected books on numerical linear algebra. *SIAM Review*, 41(3):607–610, September 1999. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic).

**Higham:1999:FTP**

[Hig99c] Nicholas J. Higham. A fitting tribute to a pioneering numerical analyst [Cleve Moler]. *SIAM News*, 32(10):3, December 1999. ISSN 0036-1437. URL <https://www.siam.org/news/news.php?id=796>. Celebrating Cleve Moler’s 60th birthday!

**Higham:1999:NAS**

[Hig99d] Nicholas J. Higham. Notes on accuracy and stability of algorithms in numerical analysis. In Ainsworth et al. [ALM99], pages 48–82. ISBN 3-540-65752-5 (hardcover). ISSN 0179-3632. LCCN QA 297 G67 1999. The Eighth EPSRC Numerical Analysis Summer School was held at the University of Leicester from the 5th to the 17th of July, 1998.

**Higham:1999:RPD**

[Hig99e] Nicholas J. Higham. Review of “Peter D. Lax, *Linear Algebra*, Wiley, 1997”. *Bulletin of the London Mathematical Society*, 31:374–375, 1999. CODEN LMSBBT. ISSN 0024-6093 (print), 1469-2120 (electronic).

**Higham:1999:SBL**

[Hig99f] Nicholas J. Higham. Stability of block LDL<sup>T</sup> factorization of a symmetric tridiagonal matrix. *Linear Algebra and Appl.*, 287(1–3):181–189, January 15, 1999. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). URL <http://>

- www.elsevier.com/cas/tree/store/laa/sub/1999/287/1-3/6193.pdf; [http://www.elsevier.com/cgi-bin/cas/tree/store/laa/cas\\_sub/browse/browse.cgi?year=1999&volume=287&issue=1-3&aid=6193](http://www.elsevier.com/cgi-bin/cas/tree/store/laa/cas_sub/browse/browse.cgi?year=1999&volume=287&issue=1-3&aid=6193). [Hig01a]
- [Hig00a] Nicholas J. Higham. QR factorization with complete pivoting and accurate computation of the SVD. *Linear Algebra and Appl.*, 309(1–3):153–174, 2000. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). [Hig01b]
- [Hig00b] Nicholas J. Higham. QR factorization with complete pivoting and accurate computation of the SVD. *Linear Algebra and Appl.*, 309(1–3):153–174, April 15, 2000. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). URL <http://www.elsevier.nl/gej-ng/10/30/19/126/25/34/abstract.html>; <http://www.elsevier.nl/gej-ng/10/30/19/126/25/34/article.pdf>. [Hig02a]
- [Hig00c] Nicholas J. Higham. Review of “Jack J. Dongarra, Iain S. Duff, Danny C. Sorensen, and Henk A. van der Vorst, *Numerical Linear Algebra for High-Performance Computers*, Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 1998”. *SIAM Review*, 42(3):529, September 2000. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic). [Hig02b]
- Higham:2000:FPC**
- Higham:2001:EPA**
- Higham:2001:RMA**
- Higham:2000:QFC**
- Higham:2002:ASN**
- Higham:2000:RJJ**
- Higham:2002:CNC**

- 3642 (electronic). URL [http://www3.oup.co.uk/imanum/hdb/Volume\\_22/Issue\\_03/220329.sgm.abs.html](http://www3.oup.co.uk/imanum/hdb/Volume_22/Issue_03/220329.sgm.abs.html); [http://www3.oup.co.uk/imanum/hdb/Volume\\_22/Issue\\_03/pdf/220329.pdf](http://www3.oup.co.uk/imanum/hdb/Volume_22/Issue_03/pdf/220329.pdf). [Hig03a]
- Higham:2002:MCT**
- [Hig02c] Nicholas J. Higham. The Matrix Computation Toolbox for MATLAB (version 1.0). Numerical Analysis Report 410, Manchester Centre for Computational Mathematics, Manchester, England, August 2002. 19 pp. [Hig03b]
- Higham:2002:RAN**
- [Hig02d] Nicholas J. Higham. Review of “Arnold Neumaier. *Introduction to Numerical Analysis*. Cambridge University Press, 2001”. *SIAM Review*, 44(3): 492–493, September 2002. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic). [Hig04]
- Higham:2002:RMO**
- [Hig02e] Nicholas J. Higham. Review of “Michael Overton, *Numerical Computing with IEEE Floating Point Arithmetic: Including One Theorem, One Rule of Thumb, and One Hundred and One Exercises*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 2001”. *SIAM Review*, 44(2): 287–288, June 2002. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic).
- Higham:2003:OMP**
- Nicholas J. Higham. *J*-orthogonal matrices: Properties and generation. *SIAM Review*, 45(3):504–519, September 2003. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/41493>.
- Higham:2003:SPS**
- [Hig03b] Nicholas J. Higham. SIAG/LA prizewinners speed up the *QR* algorithm. *SIAM News*, 36(9): 3, November 2003. ISSN 0036-1437.
- Higham:2004:NSB**
- [Hig04] Nicholas J. Higham. The numerical stability of barycentric Lagrange interpolation. *IMA Journal of Numerical Analysis*, 24(4):547–556, October 2004. CODEN IJ-NADH. ISSN 0272-4979 (print), 1464-3642 (electronic). URL <http://imanum.oupjournals.org/cgi/content/abstract/24/4/547>; <http://imanum.oupjournals.org/cgi/reprint/24/4/547>.
- Higham:2005:BRS**
- [Hig05a] Nicholas J. Higham. Book review: The SIAM 100-Digit Challenge: A Study in High-Accuracy Numerical Computing. By Folkmar Bornemann, Dirk Laurie, Stan Wagon, and Jörg Waldvogel. SIAM, Philadelphia, 2004. \$57.00. xii

- + 306 pp., hardcover. ISBN 0-89871-561-X. *SIAM Review*, 47 (2):382–383, June 2005. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/97149>.
- [Hig05b] **Higham:2005:IPLa**  
 Nicholas J. Higham. An interview with Peter Lancaster. Numerical Analysis Report 468, Manchester Centre for Computational Mathematics, Manchester, England, June 2005. 10 pp.
- [Hig05c] **Higham:2005:IPLb**  
 Nicholas J. Higham. An interview with Peter Lancaster. *SIAM News*, 38(6):5–6, July/August 2005. ISSN 0036-1437.
- [Hig05d] **Higham:2005:SSM**  
 Nicholas J. Higham. The scaling and squaring method for the matrix exponential revisited. *SIAM J. Matrix Anal. Appl.*, 26(4):1179–1193, October 2005. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/61101>.
- [Hig06a] **Higham:2006:RAJ**  
 Nicholas J. Higham. Review of “Alan J. Laub. *Matrix Analysis for Scientists and Engineers*”. *SIAM Review*, 48(1):170–171, March 2006. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic).
- [Hig06b] **Higham:2006:RMC**  
 Nicholas J. Higham. Review of “Moody T. Chu and Gene H. Golub. *Inverse Eigenvalue Problems: Theory, Algorithms, and Applications*”. *Journal of Fluid Mechanics*, 556:442–443, 2006. CODEN JFLSA7. ISSN 0022-1120 (print), 1469-7645 (electronic).
- [Hig07a] **Higham:2007:FM**  
 Nicholas J. Higham. Functions of matrices. In Hogben [Hog07], page ?? ISBN 1-58488-510-6 (hardcover), 1-4200-1057-3 (e-book). LCCN QA184.2 .H36 2007. URL <http://www.crcnetbase.com/isbn/9781420010572>; <http://www.crcnetbase.com/isbn/9781584885108>; <http://www.loc.gov/catdir/enhancements/fy0647/2006045491-d.html>. Associate editors: Richard Brualdi, Anne Greenbaum and Roy Mathias.
- [Hig07b] **Higham:2007:MFA**  
 Nicholas J. Higham. Matrix factorizations and applications: Commentary. In Chan et al. [CGO07], page ?? ISBN 0-19-920681-3. LCCN QA188 .G67 2007. URL <http://www.loc.gov/catdir/enhancements/fy0737/2007276086-d.html>.
- [Hig07c] **Higham:2007:RLT**  
 Nicholas J. Higham. Review of “Lloyd N. Trefethen and Mark Embree. *Spectra and Pseudospectra: The Behavior of Non-*



- normal Matrices and Operators". *Bulletin of the American Mathematical Society*, 44 (2):277–284, 2007. CODEN BAMOAD. ISSN 0002-9904 (print), 1936-881X (electronic).
- [Hig08a] Nicholas J. Higham. Cayley, Sylvester, and early matrix theory. *Linear Algebra and Appl.*, 428(1):39–43, 2008. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).
- [Hig08b] Nicholas J. Higham. *Functions of Matrices: Theory and Computation*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 2008. ISBN 0-89871-646-2. xx + 425 pp. Theory and computation.
- [Hig08c] Nicholas J. Higham. In his own words [interview with Gene Golub]. *SIAM News*, 41(1):3, January/February 2008. ISSN 0036-1437. URL <https://www.siam.org/news/news.php?id=1290>. Extracts from [?].
- [Hig08d] Nicholas J. Higham. An interview with Gene Golub. MIMS EPrint 2008.8, Manchester Institute for Mathematical Sciences, The University of Manchester, Manchester, UK, February 2008. 13 pp.
- [Hig08e] Nicholas J. Higham. The Matrix Function Toolbox, 2008. URL <http://www.maths.manchester.ac.uk/~higham/mfttoolbox>.
- [Hig09] Nicholas J. Higham. The scaling and squaring method for the matrix exponential revisited. *SIAM Review*, 51(4):747–764, 2009. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic).
- [Hig14] Nicholas J. Higham. Sylvester's influence on applied mathematics. *Mathematics Today*, 50(4):202–206, 2014. ISSN 1361-2042.
- [Hig15] Nicholas J. Higham. Matrix computation toolbox. Web site., 2015. URL <http://www.ma.man.ac.uk/~higham/mctoolbox>.
- [Hig16a] Nicholas J. Higham. Knuth gives satisfaction in SIAM von Neumann Lecture. *SIAM News*, 49 (6):??, July/August 2016. ISSN 0036-1437. URL <https://sinews.siam.org/DetailsPage/TabId/900/ArtMID/2243/ArticleID/820/Knuth-Gives-Satisfaction-in-SIAM-von-Neumann-Lecture.aspx>.
- [Hig16b] Nicholas J. Higham. Mathematical word processing: Historical

- snippets. *SIAM News*, 49(6):??, July/August 2016. ISSN 0036-1437. URL <https://sinews.siam.org/DetailsPage/TabId/900/ArtMID/2243/ArticleID/1655/Mathematical-Word-Processing-Historical-Snippets.aspx>. [Hig18d]
- [Hig17a] N. J. Higham. The rise of multi-precision arithmetic. In Burgess et al. [BBdD17], page 1. ISBN 1-5386-1966-0 (print), 1-5386-1965-2, 1-5386-1964-4. ISSN 1063-6889. LCCN QA76.9.C62 S95 2017. URL <http://ieeexplore.ieee.org/servlet/opac?punumber=8019911>. [Hig18e]
- [Hig17b] Nicholas J. Higham. A multi-precision world. *SIAM News*, 50(8):??, October 2, 2017. ISSN 0036-1437. URL <https://sinews.siam.org/DetailsPage/a-multiprecision-world>. [Hig18f]
- [Hig18a] Nicholas Higham. Differentiation with(out) a difference. *SIAM News*, 51(5):2, 2018. ISSN 1557-9573.
- [Hig18b] Nicholas Higham. Rhapsodizing about Bohemian matrices. *SIAM News*, 51(10):2, 2018. ISSN 1557-9573.
- [Hig18c] Nicholas Higham. Snap to structure. *SIAM News*, 51(1):2, 2018. ISSN 1557-9573.
- [Higham:2017:RMA]
- [Higham:2018:TFD]
- Nicholas Higham. A timely focus on data science. *SIAM News*, 51(9):2, 2018. ISSN 1557-9573.
- [Higham:2018:HPA]
- Nicholas J. Higham. Half precision arithmetic: fp16 versus bfloat16. Web site., December 3, 2018. URL <https://nickhigham.wordpress.com/2018/12/03/half-precision-arithmetic-fp16-versus-bfloat16/>.
- [Higham:2018:UN]
- Nicholas J. Higham. The unwinding number. *SIAM News*, 51(8):2, October 2018. ISSN 0036-1437. URL <https://sinews.siam.org/DetailsPage/the-unwinding-number>.
- [Higham:2020:HWM]
- Nicholas J. Higham. *Handbook of Writing for the Mathematical Sciences*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 2020. ISBN 91-611-9760-9-X (paperback), 1-61197-610-3 (e-book). xxi + 353 pp. LCCN QA42 .H54 2020.
- [Higham:2023:NSA]
- Nicholas J. Higham. Numerical stability of algorithms at extreme scale and low precisions. In ????, editor, *ICM — International Congress of Mathematicians. Vol. 7. Sections 15–20*, pages 5098–5117. EMS Press, Berlin, Germany, 2023. ISBN

3-9854706-5-0, 3-9854756-5-2, 3-9854705-8-8.

**Higham:1993:CEA**

- [HK93a] Nicholas J. Higham and Philip A. Knight. Componentwise error analysis for stationary iterative methods. In Meyer and Plemmons [MP93], pages 29–46. ISBN 0-387-94085-5 (New York), 3-540-94085-5 (Berlin). LCCN QA184.L545 1993. URL <http://catalog.hathitrust.org/api/volumes/oclc/28182134.html>; <http://www.gbv.de/dms/ilmenau/toc/126000387.pdf>; <http://www.zentralblatt-math.org/zmath/en/search/?an=0779.00020>. [HK01]

**Higham:1993:FPB**

- [HK93b] Nicholas J. Higham and Philip A. Knight. Finite precision behavior of stationary iteration for solving singular systems. *Linear Algebra and Appl.*, 192:165–186, 1993. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). [HK02]

**Higham:1995:MPF**

- [HK95] Nicholas J. Higham and Philip A. Knight. Matrix powers in finite precision arithmetic. *SIAM J. Matrix Anal. Appl.*, 16(2):343–358, April 1995. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). [HK17]

**Higham:2000:NAQ**

- [HK00] Nicholas J. Higham and Hyun-Min Kim. Numerical analy-

sis of a quadratic matrix equation. *IMA Journal of Numerical Analysis*, 20(4):499–519, October 2000. CODEN IJNADH. ISSN 0272-4979 (print), 1464-3642 (electronic). URL [http://www3.oup.co.uk/imanum/hdb/Volume\\_20/Issue\\_04/200499abs.pdf](http://www3.oup.co.uk/imanum/hdb/Volume_20/Issue_04/200499abs.pdf); [http://www3.oup.co.uk/imanum/hdb/Volume\\_20/Issue\\_04/pdf/200499.pdf](http://www3.oup.co.uk/imanum/hdb/Volume_20/Issue_04/pdf/200499.pdf).

**Higham:2001:SQM**

Nicholas J. Higham and Hyun-Min Kim. Solving a quadratic matrix equation by Newton’s method with exact line searches. *SIAM J. Matrix Anal. Appl.*, 23(2):303–316, 2001. CODEN SJMAEL. ISSN 1095-7162.

**Higham:2002:SQM**

Nicholas J. Higham and Hyun-Min Kim. Solving a quadratic matrix equation by Newton’s method with exact line searches. *SIAM J. Matrix Anal. Appl.*, 23(2):303–316, April 2002. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/35097>.

**Higham:2017:CAT**

Nicholas J. Higham and Peter Kandolf. Computing the action of trigonometric and hyperbolic matrix functions. *SIAM Journal on Scientific Computing*, 39(2):A613–A627, 2017. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

- Higham:2011:RSM**
- [HL11a] Nicholas J. Higham and Lijing Lin. On  $p$ -th roots of stochastic matrices. *Linear Algebra and Appl.*, 435(3):448–463, August 1, 2011. CODEN LAA-PAW. ISSN 0024-3795 (print), 1873-1856 (electronic).
- Higham:2011:SPA**
- [HL11b] Nicholas J. Higham and Lijing Lin. A Schur–Padé algorithm for fractional powers of a matrix. *SIAM J. Matrix Anal. Appl.*, 32(3):1056–1078, 2011. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- Higham:2013:ISP**
- [HL13] Nicholas J. Higham and Lijing Lin. An improved Schur–Padé algorithm for fractional powers of a matrix and their Fréchet derivatives. *SIAM J. Matrix Anal. Appl.*, 34(3):1341–1360, 2013. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- Higham:2015:MFS**
- [HL15] Nicholas J. Higham and Lijing Lin. Matrix functions: a short course. In Zhaojun Bai, Weiguo Gao, and Yangfeng Su, editors, *Matrix Functions and Matrix Equations*, volume 19 of *Ser. Contemp. Appl. Math. CAM*, pages 1–27. World Scientific Publishing Co., Singapore; Philadelphia, PA, USA; River Edge, NJ, USA, 2015. ISBN 981-4675-76-8 (hardcover), 981-4675-77-6 (e-book), 981-4675-78-4 (e-book). LCCN QA184.2.M39 2015. URL <http://www.worldscientific.com/worldscibooks/10.1142/9590>.
- Higham:2021:MDF**
- [HL21] Nicholas J. Higham and Xiaobo Liu. A multiprecision derivative-free Schur–Parlett algorithm for computing matrix functions. *SIAM J. Matrix Anal. Appl.*, 42(3):1401–1422, 2021. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).
- Higham:2022:OFW**
- [HL22] Nicholas J. Higham and Matthew C. Lettington. Optimizing and factorizing the Wilson matrix. *American Mathematical Monthly*, 129(5):454–465, 2022. CODEN AMMYAE. ISSN 0002-9890 (print), 1930-0972 (electronic).
- Higham:2021:IMF**
- [HLS21] Nicholas J. Higham, Matthew C. Lettington, and Karl Michael Schmidt. Integer matrix factorisations, superalgebras and the quadratic form obstruction. *Linear Algebra and Appl.*, 622:250–267, 2021. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic).
- Higham:2007:BEP**
- [HLT07] Nicholas J. Higham, Ren-Cang Li, and Françoise Tisseur. Backward error of polynomial eigenproblems solved by linearization.

*SIAM J. Matrix Anal. Appl.*, 29(4):1218–1241, 2007. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2008:BEP**

[HLT08]

Nicholas J. Higham, Ren-Cang Li, and Françoise Tisseur. Backward error of polynomial eigenproblems solved by linearization. *SIAM J. Matrix Anal. Appl.*, 29(4):1218–1241, 2008. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2019:NAP**

[HM19a]

Nicholas J. Higham and Theo Mary. A new approach to probabilistic rounding error analysis. *SIAM Journal on Scientific Computing*, 41(5):A2815–A2835, 2019. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:2019:NPE**

[HM19b]

Nicholas J. Higham and Theo Mary. A new preconditioner that exploits low-rank approximations to factorization error. *SIAM Journal on Scientific Computing*, 41(1):A59–A82, 2019. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:2020:SPB**

[HM20]

Nicholas J. Higham and Theo Mary. Sharper probabilistic backward error analysis for basic linear algebra kernels with random data. *SIAM Journal on Scientific Computing*, 42(5):A3427–

A3446, 2020. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:2022:MPA**

[HM22a]

Nicholas J. Higham and Theo Mary. Mixed precision algorithms in numerical linear algebra. *Acta Numerica*, 31:347–414, May 2022. CODEN ANUMFU. ISSN 0962-4929 (print), 1474-0508 (electronic). URL <https://www.cambridge.org/core/journals/acta-numerica/article/mixed-precision-algorithms-in-numerical-linear-algebra/43CA701BA29251B5790C653E66F46197>.

**Higham:2022:SBL**

[HM22b]

Nicholas J. Higham and Theo Mary. Solving block low-rank linear systems by  $LU$  factorization is numerically stable. *IMA Journal of Numerical Analysis*, 42(2):951–980, April 2022. CODEN IJNADH. ISSN 0272-4979 (print), 1464-3642 (electronic). URL <http://academic.oup.com/imajna/article/42/2/951/6238550>.

**Higham:2022:AEM**

[HM22c]

Nicholas J. Higham and Mantas Mikaitis. Anymatrix: an extensible MATLAB matrix collection. *Numerical Algorithms*, 90(3):1175–1196, July 2022. CODEN NUALEG. ISSN 1017-1398 (print), 1572-9265 (electronic). URL <https://link.springer.com/article/10.1007/s11075-021-01226-2>.

**Higham:2004:CPD**

- [HMMT04] Nicholas J. Higham, D. Steven Mackey, Niloufer Mackey, and Françoise Tisseur. Computing the polar decomposition and the matrix sign decomposition in matrix groups. *SIAM J. Matrix Anal. Appl.*, 25(4):1178–1192, October 2004. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/42664>.

**Higham:2005:FPM**

- [HMMT05] Nicholas J. Higham, D. Steven Mackey, Niloufer Mackey, and Françoise Tisseur. Functions preserving matrix groups and iterations for the matrix square root. *SIAM J. Matrix Anal. Appl.*, 26(3):849–877, July 2005. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/44221>.

**Higham:2006:SLM**

- [HMMT07a] Nicholas J. Higham, D. Steven Mackey, Niloufer Mackey, and Françoise Tisseur. Symmetric linearizations for matrix polynomials. *SIAM J. Matrix Anal. Appl.*, 29(1):143–159, 2006/2007. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2007:SLM**

- [HMMT07b] Nicholas J. Higham, D. Steven Mackey, Niloufer Mackey, and

Françoise Tisseur. Symmetric linearizations for matrix polynomials. *SIAM J. Matrix Anal. Appl.*, 29(1):143–159, 2007. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2009:CGP**

- [HMT10] Nicholas J. Higham, Christian Mehl, and Françoise Tisseur. The canonical generalized polar decomposition. *SIAM J. Matrix Anal. Appl.*, 31(4):2163–2180, 2009/10. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2006:CLM**

- [HMT06] Nicholas J. Higham, D. Steven Mackey, and Françoise Tisseur. The conditioning of linearizations of matrix polynomials. *SIAM J. Matrix Anal. Appl.*, 28(4):1005–1028, January 2006. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2009:DMP**

- [HMT09] Nicholas J. Higham, D. Steven Mackey, and Françoise Tisseur. Definite matrix polynomials and their linearization by definite pencils. *SIAM J. Matrix Anal. Appl.*, 31(2):478–502, 2009. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2010:CGP**

- [HMT10] Nicholas J. Higham, Christian Mehl, and Françoise Tisseur.

The canonical generalized polar decomposition. *SIAM J. Matrix Anal. Appl.*, 31(4):2163–2180, 2010. CODEN SJ-MAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2008:SSS**

- [HMTG08] Nicholas J. Higham, D. Steven Mackey, Françoise Tisseur, and Seamus D. Garvey. Scaling, sensitivity and stability in the numerical solution of quadratic eigenvalue problems. *International Journal for Numerical Methods in Engineering*, 73(3):344–360, 2008. CODEN IJN-MBH. ISSN 0029-5981 (print), 1097-0207 (electronic).

**Higham:2016:ACP**

- [HN16] Nicholas J. Higham and Vanni Noferini. An algorithm to compute the polar decomposition of a  $3 \times 3$  matrix. *Numerical Algorithms*, 73(2):349–369, October 2016. CODEN NUALEG. ISSN 1017-1398 (print), 1572-9265 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s11075-016-0098-7.pdf>.

**Hogben:2007:HLA**

- [Hog07] Leslie Hogben, editor. *Handbook of Linear Algebra*. Discrete Mathematics and its Applications (Boca Raton). Chapman and Hall/CRC, Boca Raton, FL, USA, 2007. ISBN 1-58488-510-6 (hardcover), 1-4200-1057-3 (e-book). xxx + 1370 pp.

LCCN QA184.2 .H36 2007. URL <http://www.crcnetbase.com/isbn/9781420010572>; <http://www.crcnetbase.com/isbn/9781584885108>; <http://www.loc.gov/catdir/enhancements/fy0647/2006045491-d.html>. Associate editors: Richard Brualdi, Anne Greenbaum and Roy Mathias.

**Higham:1993:PSV**

- [HP93] Nicholas J. Higham and Pythagoras Papadimitriou. Parallel singular value decomposition via the polar decomposition. Numerical Analysis Report 239, Manchester Centre for Computational Mathematics, Manchester, England, October 1993.

**Higham:1994:NPA**

- [HP94a] Nicholas J. Higham and Pythagoras Papadimitriou. A new parallel algorithm for computing the singular value decomposition. In John G. Lewis, editor, *Proceedings of the Fifth SIAM Conference on Applied Linear Algebra*, pages 80–84. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 1994. ISBN 0-89871-336-6.

**Higham:1994:PAC**

- [HP94b] Nicholas J. Higham and Pythagoras Papadimitriou. A parallel algorithm for computing the polar decomposition. *Parallel Computing*, 20(8):1161–1173, August 1994. CODEN PACOEJ. ISSN 0167-8191 (print), 1872-7336 (electronic).

**Higham:1994:SPI**

- [HP94c] Nicholas J. Higham and Alex Pothen. Stability of the partitioned inverse method for parallel solution of sparse triangular systems. *SIAM Journal on Scientific Computing*, 15(1):139–148, January 1994. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:2019:SLP**

- [HP19] Nicholas J. Higham and Srikanth Pranesh. Simulating low precision floating-point arithmetic. *SIAM Journal on Scientific Computing*, 41(5):C585–C602, 2019. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:2021:ELP**

- [HP21] Nicholas J. Higham and Srikanth Pranesh. Exploiting lower precision arithmetic in solving symmetric positive definite linear systems and least squares problems. *SIAM Journal on Scientific Computing*, 43(1):A258–A277, 2021. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:2019:SMH**

- [HPZ19] Nicholas J. Higham, Srikanth Pranesh, and Mawussi Zounon. Squeezing a matrix into half precision, with an application to solving linear systems. *SIAM Journal on Scientific Computing*, 41(4):A2536–A2551, 2019. CODEN SJOCE3. ISSN

1064-8275 (print), 1095-7197 (electronic).

**Higham:2014:ECN**

- [HR14a] Nicholas J. Higham and Samuel D. Relton. Estimating the condition number of the Fréchet derivative of a matrix function. *SIAM Journal on Scientific Computing*, 36(6):C617–C634, 2014. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:2014:HOF**

- [HR14b] Nicholas J. Higham and Samuel D. Relton. Higher order Fréchet derivatives of matrix functions and the level-2 condition number. *SIAM J. Matrix Anal. Appl.*, 35(3):1019–1037, 2014. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2016:ELE**

- [HR16] Nicholas J. Higham and Samuel D. Relton. Estimating the largest elements of a matrix. *SIAM Journal on Scientific Computing*, 38(5):C584–C601, 2016. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Higham:1987:NLA**

- [HS87] N. J. Higham and G. W. Stewart. Numerical linear algebra in statistical computing. In Iserles and Powell [IP87], pages 41–57. ISBN 0-19-853614-3. LCCN QA297.J65 1986. URL <http://www.gbv.de/dms/hbz/toc/>



ht002967923.pdf; <http://zbmath.org/?q=an:0611.00024>.

**Higham:1990:FPD**

- [HS90] Nicholas J. Higham and Robert S. Schreiber. Fast polar decomposition of an arbitrary matrix. *SIAM Journal on Scientific and Statistical Computing*, 11(4):648–655, July 1990. CODEN SIJCD4. ISSN 0196-5204.

**Higham:1998:NWE**

- [HS98] Nicholas J. Higham and David J. Silvester. “Nothing was Ever the Same Again”. *SIAM News*, 31(7):1, 8, September 1998. ISSN 0036-1437. URL <https://www.siam.org/news/news.php?id=868>.

**Higham:2003:CMC**

- [HS03] Nicholas J. Higham and Matthew I. Smith. Computing the matrix cosine. *Numerical Algorithms*, 34(1):13–26, September 2003. CODEN NUALEG. ISSN 1017-1398 (print), 1572-9265 (electronic). URL <http://ipsapp008.kluweronline.com/content/getfile/5058/47/2/abstract.htm>; <http://ipsapp008.kluweronline.com/content/getfile/5058/47/2/fulltext.pdf>.

**Higham:2016:AAA**

- [HS16a] Nicholas J. Higham and Nataša Strabić. Anderson acceleration of the alternating projections method for computing the nearest correlation matrix. *Numerical Algorithms*, 72(4):

1021–1042, August 2016. CODEN NUALEG. ISSN 1017-1398 (print), 1572-9265 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s11075-015-0078-3.pdf>.

**Higham:2016:BDN**

- [HS16b] Nicholas J. Higham and Nataša Strabić. Bounds for the distance to the nearest correlation matrix. *SIAM J. Matrix Anal. Appl.*, 37(3):1088–1102, 2016. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic).

**Higham:2022:HCP**

- [HS22] Nicholas J. Higham and Dennis Sherwood. *How to Be Creative: a Practical Guide for the Mathematical Sciences*, volume 179 of *OT*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 2022. ISBN 1-61197-702-9 (paperback), 1-61197-703-7 (e-book). xii + 109 pp. LCCN QA63 .H54 2022.

**Higham:2023:HDQ**

- [HS23] Nicholas J. Higham and Dennis Sherwood. Hamilton’s discovery of the quaternions and creativity in mathematics. *London Mathematical Society. Newsletter*, (507):28–31, 2023. ISSN 2516-3841, 2516-385X.

**Higham:2016:RDS**

- [HSŠ16] Nicholas J. Higham, Nataša Strabić, and Vedran Šego.

- Restoring definiteness via shrinking, with an application to correlation matrices with a fixed block. *SIAM Review*, 58(2): 245–263, 2016. CODEN SIREAD. ISSN 0036-1445 (print), 1095-7200 (electronic). [HT03]
- Higham:2000:BAM**
- [HT00] Nicholas J. Higham and Françoise Tisseur. A block algorithm for matrix 1-norm estimation, with an application to 1-norm pseudospectra. *SIAM J. Matrix Anal. Appl.*, 21(4):1185–1201, October 2000. CODEN SJ-MAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/35608>.
- Higham:2001:BEM**
- [HT01] Nicholas J. Higham and Françoise Tisseur. Bounds for eigenvalues of matrix polynomials. Numerical Analysis Report 371, Manchester Centre for Computational Mathematics, Manchester, England, January 2001. 16 pp. To appear in *Linear Algebra and Appl.* [HT24]
- Higham:2002:MPP**
- [HT02] Nicholas J. Higham and Françoise Tisseur. More on pseudospectra for polynomial eigenvalue problems and applications in control theory. *Linear Algebra and Appl.*, 351–352:435–453, August 15, 2002. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). Fourth special issue on linear systems and control.
- Higham:2003:BEM**
- Nicholas J. Higham and Françoise Tisseur. Bounds for eigenvalues of matrix polynomials. *Linear Algebra and Appl.*, 358(1–3):5–22, January 1, 2003. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). URL <http://www.elsevier.nl/gej-ng/10/30/19/207/25/27/abstract.html>; [http://www.sciencedirect.com/science?\\_ob=GatewayURL&\\_origin=SOCJLA&\\_urlversion=4&\\_method=citationSearch&\\_version=1&\\_piikey=S0024379501003160&\\_volkey=00243795%23358%235%2322&md5=51223bc8229cca92374c1fcdbfa6b770](http://www.sciencedirect.com/science?_ob=GatewayURL&_origin=SOCJLA&_urlversion=4&_method=citationSearch&_version=1&_piikey=S0024379501003160&_volkey=00243795%23358%235%2322&md5=51223bc8229cca92374c1fcdbfa6b770). Special issue on accurate solution of eigenvalue problems (Hagen, 2000).
- Higham:2024:ONJ**
- Desmond J. Higham and Françoise Tisseur. Obituary: Nicholas J. Higham. SIAM Web site, May 1, 2024. URL <https://sinews.siam.org/Details-Page/obituary-nicholas-j-higham>.
- Haidar:2018:HGT**
- Azzam Haidar, Stanimire Tomov, Jack Dongarra, and Nicholas J. Higham. Harnessing GPU tensor cores for fast FP16 arithmetic to speed up mixed-precision iterative refinement solvers. In IEEE, editor, *SC '18 Proceedings of the International Conference for High*

*Performance Computing, Networking, Storage, and Analysis, Dallas, Texas, November 11–16, 2018*, pages 47:1–47:11. IEEE Computer Society Press, 1109 Spring Street, Suite 300, Silver Spring, MD 20910, USA, 2018. ISBN 1-5386-8384-9. LCCN ???? URL <https://dl.acm.org/citation.cfm?id=3291656.3291719>.

**Higham:2002:DDH**

- [HTV02] Nicholas J. Higham, Françoise Tisseur, and Paul M. Van Dooren. Detecting a definite Hermitian pair and a hyperbolic or elliptic quadratic eigenvalue problem, and associated nearness problems. *Linear Algebra and Appl.*, 351–352:455–474, August 15, 2002. CODEN LAA-PAW. ISSN 0024-3795 (print), 1873-1856 (electronic). Fourth special issue on linear systems and control.

**Higham:1998:NAP**

- [HWG98] D. J. (Desmond J.) Higham, G. A. Watson, and D. F. (David Francis) Griffiths, editors. *Numerical analysis 1997: proceedings of the 17th Dundee Biennial Conference, June 24–27, 1997*, volume 380 of *Pitman Research Notes in Mathematics*. Longman Scientific and Technical, Essex, UK, 1998. ISBN 0-582-31261-2 (paperback). ISSN 0269-3674. LCCN QA297 .D85 1997.

**Iserles:1987:SAN**

- [IP87] A. Iserles and M. J. D. Pow-

ell, editors. *State of the Art in Numerical Analysis. Proceedings of the Joint IMA/SIAM Conference held at the University of Birmingham, 14–18 April 1986*, volume 9 of *The Institute of Mathematics and Its Applications conference series; new series*. Oxford University Press, Walton Street, Oxford OX2 6DP, UK, 1987. ISBN 0-19-853614-3. LCCN QA297.J65 1986. URL <http://www.gbv.de/dms/hbz/toc/ht002967923.pdf>; <http://zbmath.org/?q=an:0611.00024>. ■

**Lin:2014:CSR**

- [LHP14] Lijing Lin, Nicholas J. Higham, and Jianxin Pan. Covariance structure regularization via entropy loss function. *Computational Statistics & Data Analysis*, 72:315–327, 2014. CODEN CSDADW. ISSN 0167-9473 (print), 1872-7352 (electronic).

**Moonen:1993:LAL**

- [MGD93] Marc S. Moonen, Gene H. Golub, and Bart L. R. De Moor, editors. *Linear Algebra for Large Scale and Real-Time Applications: Proceedings of the NATO Advanced Study Institute, Leuven, Belgium, August 3–14, 1992*, volume 232 of *NATO ASI series. Series E, Applied sciences*. Kluwer Academic Publishers, Norwell, MA, USA, and Dordrecht, The Netherlands, 1993. ISBN 0-7923-2151-0. LCCN QA185.D37 L56 1993.

URL <http://catdir.loc.gov/catdir/enhancements/fy0823/92046135-d.html>; <http://www.gbv.de/dms/hbz/toc/ht004938330.pdf>; <http://zbmath.org/?q=an:0810.00029>. [NH13]

**Meyer:1993:LAM**

- [MP93] C. D. (Carl Dean) Meyer and Robert J. Plemmons, editors. *Linear algebra, Markov chains, and queueing models: [... some of the lectures given at the Workshop Linear Algebra, Markov Chains, and Queueing Models held January 13–17, 1992, as part of the Year of Applied Linear Algebra at the Institute for Mathematics and its Applications]*, volume 48 of *The IMA volumes in mathematics and its applications*. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1993. ISBN 0-387-94085-5 (New York), 3-540-94085-5 (Berlin). LCCN QA184 .L545 1993. URL <http://catalog.hathitrust.org/api/volumes/oclc/28182134.html>; <http://www.gbv.de/dms/ilmenau/toc/126000387.pdf>; <http://www.zentralblatt-math.org/zmath/en/search/?an=0779.00020>. [NH18]
- [NN24] Yuji Nakatsukasa and Vanni Noferini. Nick Higham (1961–2024). *Linear Algebra and Appl.*, 698(??):1–4, October 1, 2024. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). URL <http://www.sciencedirect.com/science/article/pii/S0024379524002039>. [NH12]

**Nakatsukasa:2012:BSI**

- [NH12] Yuji Nakatsukasa and Nicholas J. Higham. Backward stability of iterations for computing the polar decomposition. *SIAM J. Matrix Anal. Appl.*, 33(2):460–479, ??? 2012. CODEN SJMAEL. [SLEK19]

ISSN 0895-4798 (print), 1095-7162 (electronic).

**Nakatsukasa:2013:SES**

Yuji Nakatsukasa and Nicholas J. Higham. Stable and efficient spectral divide and conquer algorithms for the symmetric eigenvalue decomposition and the SVD. *SIAM Journal on Scientific Computing*, 35(3):A1325–A1349, ??? 2013. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic). See [SLEK19].

**Nadukandi:2018:CWK**

Prashanth Nadukandi and Nicholas J. Higham. Computing the wavekernel matrix functions. *SIAM Journal on Scientific Computing*, 40(6):A4060–A4082, ??? 2018. CODEN SJOCE3. ISSN 1064-8275 (print), 1095-7197 (electronic).

**Nakatsukasa:2024:NH**

Yuji Nakatsukasa and Vanni Noferini. Nick Higham (1961–2024). *Linear Algebra and Appl.*, 698(??):1–4, October 1, 2024. CODEN LAAPAW. ISSN 0024-3795 (print), 1873-1856 (electronic). URL <http://www.sciencedirect.com/science/article/pii/S0024379524002039>. [Sukkari:2019:QBS]

**Sukkari:2019:QBS**

Dalal Sukkari, Hatem Ltaief, Aniello Esposito, and David Keyes. A QDWH-based SVD software framework on distributed-memory manycore

- systems. *ACM Trans. Math. Software*, 45(2):18:1–18:21, April 2019. CODEN ACMSCU. ISSN 0098-3500 (print), 1557-7295 (electronic). URL <https://dl.acm.org/citation.cfm?id=3309548>. See [NH13]. [WG00]
- [TH01] Françoise Tisseur and Nicholas J. Higham. Structured pseudospectra for polynomial eigenvalue problems, with applications. *SIAM J. Matrix Anal. Appl.*, 23(1):187–208, 2001. CODEN SJMAEL. ISSN 1095-7162. **Tisseur:2001:SPP**
- [TH02] Françoise Tisseur and Nicholas J. Higham. Structured pseudospectra for polynomial eigenvalue problems, with applications. *SIAM J. Matrix Anal. Appl.*, 23(1):187–208, January 2002. CODEN SJMAEL. ISSN 0895-4798 (print), 1095-7162 (electronic). URL <http://epubs.siam.org/sam-bin/dbq/article/37145>. [Wil23] **Tisseur:2002:SPP**
- [THDC09] Anne Trefethen, Nick Higham, Iain Duff, and Peter Coveney. Developing a high-performance computing/numerical analysis roadmap. *The International Journal of High Performance Computing Applications*, 23(4):423–426, November 2009. CODEN IHPCFL. ISSN 1094-3420 (print), 1741-2846 (electronic). URL <http://hpc.sagepub.com/content/23/4/423.full.pdf+html>. [ZH16] **Trefethen:2009:DHP**
- [ZHLT22] Mawussi Zounon, Nicholas J. Higham, Craig Lucas, and Françoise Tisseur. Performance impact of precision reduction in sparse linear systems solvers. **Zounon:2022:PIP**
- [Watson:2000:NAD] George Alistair Watson and David Francis Griffiths, editors. *Numerical analysis 1999: [the 18th Dundee Biennial Conference on Numerical Analysis was held at the University of Dundee during the 4 days 29th June–2nd July, 1999]*, volume 420 of *Chapman & Hall/CRC Research Notes in Mathematics*. Chapman and Hall/CRC, Boca Raton, FL, USA, 2000. ISBN 1-58488-020-1 (paperback). LCCN QA297 .D85 1999; QA297 .N825 2000; QA297 .N853 1999.
- [Wilkinson:2023:REA] J. H. (James Hardy) Wilkinson. *Rounding Errors in Algebraic Processes*, volume 89 of *Classics in applied mathematics*. Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, 2023. ISBN 1-61197-751-7. xiii + 161 pp. LCCN QA275 .W64 2023. New foreword by N. J. Higham. **Wilkinson:2023:REA**
- [Zhang:2016:MDE] Weijian Zhang and Nicholas J. Higham. Matrix Depot: an extensible test matrix collection for Julia. *PeerJ Computer Science*, 2:e58:1–e58:25, April 2016. ISSN 2376-5992. **Zhang:2016:MDE**

*PeerJ Computer Science*, 8:  
e778:a-e778:22, January 2022.  
ISSN 2376-5992.