recommended to anyone with sufficient technical background – after all, its subject is of crucial importance to everybody – and particularly to all educated people engaged in formulating policy, especially in government and the military. What I would like to see now is a lighter book (in both senses) aimed at a more general readership but covering the same range of more advanced issues.

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Linear algebra for everyone by Gilbert Strang, pp 368, £49.99 (hard), ISBN 978-1-73314-663-0, Cambridge University Press (2020)

Linear Algebra for *Everyone*? The author already has a book called 'Introduction to Linear Algebra', fifth edition 2021. So what's new? The fourth line of the preface to the present book starts 'Suppose we are given a 3 by 3 matrix ...' so this is clearly not a 'popular' exposition of the subject. The book has an unusual emphasis on rows and columns of a matrix and the spaces they span, the row space and the column space of the matrix. After a standard first section on vectors, instead of proceeding with solution of linear equations (as in the author's other textbook) the present book works towards factorizing a matrix A into CR where the columns of C span the column space of A (in fact they are independent columns of A) while the rows of R are constructed to span the row space of A and R is closely connected with the row echelon form of A. Matrix factorizations are a theme of the book: sixteen such factorizations are listed in Appendix 5, including special ones for square matrices (Jordan blocks); symmetric matrices ($A = Q\Lambda Q^T$ where Q is orthogonal and Λ is the eigenvalue matrix); and general matrices (singular value decomposition). Solving equations comes next, with a strong emphasis on reduction of a matrix to upper triangular form by means of 'pivots' on the diagonal, due consideration being given to the problems that arise with singular matrices. Permutation matrices, Gauss-Jordan elimination and expressing a square matrix as lower triangular times upper triangular ('The Great Factorization $A = LU$') are followed by a digression into meanings of inner products in mechanics, electrical circuits and economics. In fact the author includes many such excursions into applications such as card shuffling, Kirchhoff's laws, Gershgorin circles (they are really disks), Fibonacci numbers and computational mechanics. (I did find some of these a little puzzling, for example on page 66 the Fast Fourier Transform appears out of the blue, with no indication of what it actually is.)

Formal definitions of row and column spaces (as vector spaces), together with the nullspaces of A and A^T come next, and this starts to look more like a standard exposition. Cramer's rule must wait until page 185, linear transformations to page 192 and eigenvalues to page 201. Is it worth the wait? The author certainly makes every effort to explain all the concepts in great detail with well-chosen examples, and he provides a huge number of problems including 'challenge problems' and 'recommended problems'. There are also extensive web resources available. The style of sentences is short and snappy: 'It is the same combination of the same vectors! In A they are columns, in A^T they are rows. So the transpose of the column A_X is the row $x^T A^T$. That fits our formula $(Ax)^T = x^T A^T$.' The coverage of material is extensive: systems of difference equations, exponential of a matrix, compressing images via the singular value decomposition and principal component analysis are all included, some of these requiring, I would say, significant mathematical maturity to follow. I do not know whether the approach taken would be more suitable for a basic linear algebra course at a UK university than standard approaches, but the book is certainly worth consideration.

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As well as heartfelt thanks to our current referees, we would extend a very warm welcome to any new recruits. For further information, please contact Dr Gerry Leversha (*g.leversha@btinternet.com*).

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