
ЛИТЕРАТУРА

- Асен (Aasen J. O.)
(1971) On the reduction of symmetric matrix to tridiagonal form, BIT 11, 233—242.
- Авриель (Avriel M.)
(1976) Nonlinear Programming: Analysis and Methods, Prentice-Hall, Englewood Cliffs, N. J.
- Алговер, Джордж (Allgower E., Georg K.)
(1980) Simplicial and continuation methods for approximating fixed points and solutions to systems of equations, SIAM Review 22, 28—85.
- Армийо (Armijo L.)
(1966) Minimization of functions having Lipschitz-continuous first partial derivatives, Pacific J. Math. 16, 1—3.
- Ахо, Хопкрофт, Ульман (Aho A. U., Hopcroft J. E., Ullman J. D.)
(1974) The Design and Analysis of Computer Algorithms, Addison-Wesley, Reading, Mass. [Имеется перевод: Ахо А., Хопкрофт Дж., Ульман Дж. Построение и анализ вычислительных алгоритмов. — М.: Мир, 1979.]
- Бакли (Buckley A. G.)
(1978) A combined conjugate gradient quasi-Newton minimization algorithm, Math. Prog. 15, 200—210.
- Банч, Парлетт (Bunch J. R., Parlett B. N.)
(1971) Direct methods for solving symmetric indefinite systems of linear equations, SIAM J. Numer. Anal. 8, 639—655.
- Бард (Bard Y.)
(1970) Nonlinear Parameter Estimation, Academic Press, New York.
- Барнес (Barnes J.)
(1965) An algorithm for solving nonlinear equations based on the secant method, Comput. J. 8, 66—72.
- Бартелс, Конн (Bartels R., Conn A.)
(1982) An approach to nonlinear l_1 data fitting, in Numerical Analysis, Cooeyoc 1981, ed. by Hennart J. P., Springer-Verlag, Lecture Notes in Math. 909, 48—58.
- Бейтс, Уоттс (Bates D. M., Watts D. G.)
(1980) Relative curvature measures of nonlinearity, J. Roy. Statist. Soc. Ser. B 42, 1—25, 235.
- Бил (Beale E. M. L.)
(1977) Integer programming, in The State of the Art in Numerical Analysis, ed. by Jacobs D., Academic Press, London, 409—448.
- Битон, Тьюки (Beaton A. E., Tukey J. W.)
(1974) The fitting of power series, meaning polynomials, illustrated on hand-spectroscopic data, Technometrics 16, 147—192.
- Боггс, Дэннис (Boggs P. T., Dennis J. E., Jr.)
(1976) A stability analysis for perturbed nonlinear iterative methods, Math. Comp. 30, 1—17.
- Брайян (Bryan C. A.)
(1968) Approximate solutions to nonlinear integral equations, SIAM J. Numer. Anal. 5, 151—155.
- Брент (Brent R. P.)
(1973) Algorithms for Minimization without Derivatives, Prentice-Hall, Englewood Cliffs, N. J.
- Бродли (Brodli K. W.)
(1977) Unconstrained minimization, in The State of the Art in Numerical Analysis, ed. by Jacobs D., Academic Press, London, 229—268.

- Бройден (Broyden C. G.)
 (1965) A class of methods for solving nonlinear simultaneous equations, *Math. Comp.* 19, 577—593.
 (1969) A new double-rank minimization algorithm, *AMS Notices* 16, 670.
 (1970) The convergence of a class of double-rank minimization algorithms, Parts I and II, *J. I. M. A.* 6, 76—90, 222—236.
 (1971) The convergence of algorithm for solving sparse nonlinear systems, *Math. Comp.* 25, 285—294.
- Бройден, Дэннис, Морэ (Broyden C. G., Dennis J. E., Jr., Moré J. J.)
 (1973) On the local and superlinear convergence of quasi-Newton methods, *J. I. M. A.* 12, 223—246.
- Вандерграфт (Vandergraft J. S.)
 (1978) *Introduction to Numerical Computations*, Academic Press, New York.
- Вольф (Wolfe P.)
 (1969) Convergence conditions for ascent methods, *SIAM Review* 11, 226—235.
 (1971) Convergence conditions for ascent methods. II: Some corrections, *SIAM Review* 13, 185—188.
- Гандер (Gander W.)
 (1978) On the linear least squares problem with a quadratic constraint, *Stanford Univ. Computer Science Tech. Rept. STAN-CS-78-697*, Stanford, Calif.
 (1981) Least squares with a quadratic constraint, *Numer. Math.* 36, 291—307. [Это сокращенная версия работы Гандер (1978).]
- Гарфинкель, Немхаузер (Garfinkel R. S., Nemhauser G. L.)
 (1972) *Integer Programming*, John Wiley & Sons, New York.
- Гилл, Голуб, Мюррей, Сондерс (Gill P. E., Golub G. H., Murray W., Saunders M. A.)
 (1974) Methods for modifying matrix factorizations, *Math. Comp.* 28, 505—535.
- Гилл, Мюррей (Gill P. E., Murray W.)
 (1972) Quasi-Newton methods for unconstrained optimization, *J. I. M. A.* 9, 91—108.
- Гилл, Мюррей, Райт (Gill P. E., Murray W., Wright M. H.)
 (1981) *Practical Optimization*. Academic Press, London. [Имеется перевод: Гилл Ф., Мюррей У., Райт М. Практическая оптимизация. — М.: Мир, 1985.]
- Голдстейн (Goldstein A. A.)
 (1967) *Constructive Real Analysis*, Harper & Row, New York.
- Голдфарб (Goldfarb D.)
 (1970) A family of variable metric methods derived by variational means, *Math. Comp.* 24, 23—26.
 (1976) Factorized variable metric methods for unconstrained optimization, *Math. Comp.* 30, 796—811.
- Голдфельд, Куанд, Троттер (Goldfeldt S. M., Quandt R. E., Trotter H. F.)
 (1966) Maximization by quadratic hill-climbing, *Econometrica* 34, 541—551.
- Голуб, Ван Лоан (Golub G. H., Van Loan C.)
 (1983) *Matrix Computations*, the Johns Hopkins University Press.
- Голуб, Перейра (Golub G. H., Pereyra V.)
 (1973) The differentiation of pseudo-inverse and non-linear least squares problems whose variables separate, *SIAM J. Numer. Anal.* 10, 413—432.
- Гриванк (Griewank A. O.)
 (1982) A short proof of the Dennis-Schnabel theorem. *B. I. T.* 22, 252—256.
- Гриванк, Тоинт (Griewank A. O., Toint Ph. L.)
 (1982a) Partitioned variable metric updates for large sparse optimization problems, *Numer. Math.* 39, 119—137.

- (1982b) Local convergence analysis for partitioned quasi-Newton updates in the Broyden class, *Numer. Math.* 39, 429—448.
- (1982c) On the unconstrained optimization of partially separable functions, in *Nonlinear Optimization*, ed. by Powell M. J. D. Academic Press, London.
- Гринстадт (Greenstadt J. L.)
- (1970) Variations on variable-metric methods, *Math. Comp.* 24, 1—22.
- Гэй (Gay D. M.)
- (1979) Some convergence properties of Broyden's method, *SIAM J. Numer. Anal.*, 16, 623—630.
- (1981) Computing optimal locally constrained steps, *SIAM J. Sci. Stat. Comp.* 2, 186—197.
- Гэй, Шнабель (Gay D. M., Schnabel R. B.)
- (1978) Solving systems of nonlinear equations by Broyden's method with projected updates, in *Nonlinear Programming 3*, ed. by Mangasarian O., Meyer R., Robinson S., Academic Press, New York, 254—281.
- Дальквист, Бьёрк, Андерсон (Dahlquist G., Björck A., Anderson N.)
- (1974) *Numerical Methods*, Prentice-Hall, Englewood Cliffs, N. J.
- Дембо, Айзенштат, Штайхауг (Dembo R. S., Eisenstat S. C., Steihaug T.)
- (1982) Inexact Newton methods, *SIAM J. Numer. Anal.* 19, 400—408.
- Джонсон, Остриа (Johnson G. W., Austria N. H.)
- (1983) A quasi-Newton method employing direct secant updates of matrix factorizations, *SIAM J. Numer. Anal.* 20, 315—325.
- Диксон (Dixon L. C. W.)
- (1972a) Quasi-Newton family generate identical points, Parts I and II, *Math. Prog.* 2, 383—387, 2nd *Math. Prog.* 3, 345—358.
- (1972b) The choice of step length, a crucial factor in the performance of variable metric algorithms, in *Numerical Methods for Non-linear Optimization*, ed. by Lootsma F., Academic Press, New York, 149—170.
- Диксон, Церё (Dixon L. C. W., Szegö G. P.)
- (1975, 1978) *Towards Global Optimization*, Vols. 1, 2, North-Holland, Amsterdam.
- Донгарра, Банч, Моулер, Стюарт (Dongarra J. J., Bunch J. R., Moler C. B., Stewart G. W.)
- (1979) *LINPACK Users Guide*, SIAM Publications, Philadelphia.
- Дэвидон (Davidon W. C.)
- (1959) Variable metric methods for minimization, Argonne National Labs Report ANL-5990.
- (1975) Optimally conditioned optimization algorithms without line searches, *Math. Prog.* 9, 1—30.
- Дэннис (Dennis J. E., Jr.)
- (1971) Toward a unified convergence theory for Newton-like methods, in *Nonlinear Functional Analysis and Applications*, ed. by Rall L. B., Academic Press, New York, 425—472.
- (1977) Nonlinear least squares and equations, in *The State of the Art in Numerical Analysis*, ed. by Jacobs D., Academic Press, London, 269—312.
- (1978) A brief introduction to quasi-Newton methods, in *Numerical Analysis*, ed. by Golub G. H., Oliver J., AMS, Providence, R. I., 19—52.
- Дэннис, Гэй, Уэлш (Dennis J. E., Jr., Gay D. M., Welsch R. E.)
- (1981a) An adaptive nonlinear least-squares algorithm, *TOMS* 7, 348—368.
- (1981b) Algorithm 573 NL2SOL — An adaptive nonlinear least-squares algorithm [E4], *TOMS* 7, 369—383.
- Дэннис, Марвил (Dennis J. E., Jr., Marwil E. S.)
- (1982) Direct secant updates of matrix factorizations, *Math. Comp.* 38, 459—474.
- Дэннис, Мей (Dennis J. E., Jr., Mei H. H. W.)
- (1979) Two new unconstrained optimization algorithms which use function and gradient values, *J. Optim. Theory Appl.* 28, 453—482.

- Дэннис, Морэ (Dennis J. E., Jr., Moré J. J.)
 (1974) A characterization of superlinear convergence and its application to quasi-Newton methods, *Math. Comp.* 28, 549—560.
 (1977) Quasi-Newton methods, motivation and theory, *SIAM Review* 19, 46—89.
- Дэннис, Тапиа (Dennis J. E., Jr., Tapia R. A.)
 (1976) Supplementary terminology for nonlinear iterative methods, *SIGNUM Newsletter* 11: 4, 4—6.
- Дэннис, Уолкер (Dennis J. E., Jr., Walker H. F.)
 (1981) Convergence theorems for least-change secant update methods, *SIAM J. Numer. Anal.* 18, 949—987, 19, 443.
 (1983) Sparse secant update methods for problems with almost sparse Jacobians, in preparation.
- Дэннис, Шнабель (Dennis J. E., Jr., Schnabel R. B.)
 (1979) Least change secant updates for quasi-Newton methods, *SIAM Review* 21, 443—459.
- Зирилли (Zirilli F.)
 (1982) The solution of nonlinear systems of equations by second order systems of o.d.e. and linearly implicit A-stable techniques, *SIAM J. Numer. Anal.* 19, 800—815.
- Канторович Л. В.
 (1948) Функциональный анализ и прикладная математика. УМН 3, No. 6, 89—185.
- Кауфман (Kaufman L. C.)
 (1975) A variable projection method for solving separable nonlinear least squares problems, *BIT* 15, 49—57.
- Клайн, Моулер, Стюарт, Уилкинсон (Cline A. K., Moler C. B., Stewart G. W., Wilkinson J. H.)
 (1979) An estimate for the condition number of a matrix, *SIAM J. Numer. Anal.* 16, 368—375.
- Конт, де Бур (Conte S. D., de Boor C.)
 (1980) *Elementary Numerical Analysis: An Algorithmic Approach*, 3d ed., McGraw-Hill, New York.
- Коулман, Морэ (Coleman T. F., Moré J. J.)
 (1982) Estimation of sparse Hessian matrices and graph coloring problems, Argonne National Labs, Math.-C. S. Div. TM-4.
 (1983) Estimation of sparse Jacobian matrices and graph coloring problems, *SIAM J. Numer. Anal.* 20, 187—209.
- Куртис, Пауэлл, Райд (Curtis A., Powell M. J. D., Reid J. K.)
 (1974) On the estimation of sparse Jacobian matrices, *J. I. M. A.* 13, 117—120.
- Левенберг (Levenberg K.)
 (1944) A method for solution of certain problems in least squares, *Quart. Appl. Math.* 2, 164—168.
- Лоусон, Хенсон, Кинкейд, Крог (Lawson C. L., Hanson R. J., Kincaid D. R., Krogh F. T.)
 (1979) Basic linear algebra subprograms for Fortran usage, *ACM TOMS* 5, 308—323.
- Марвил (Marwil E. S.)
 (1978) Exploiting sparsity in Newton-type methods, Cornell Applied Math. Ph. D. Thesis.
 (1979) Convergence results for Schubert's method for solving sparse nonlinear equations, *SIAM J. Numer. Anal.* 16, 588—604.
- Маркварт (Marquardt D.)
 (1963) An algorithm for least-squares estimation of nonlinear parameters. *SIAM J. Appl. Math.* 11, 431—441.
- Морэ (Moré J. J.)
 (1977) The Levenberg — Marquardt algorithm: implementation and theory, in *Numerical Analysis*, ed. by Watson G. A., *Lecture Notes in Math.* 630, Springer-Verlag, Berlin, 105—116.

- Морэ, Гарбов, Хиллстром (Moré J. J., Garbow B. S., Hillstrom K. E.)
 (1980) User guide for MINPACK-1, Argonne National Labs Report ANL-80-74.
 (1981a) Testing unconstrained optimization software, TOMS 7, 17—41.
 (1981b) Fortran subroutines for testing unconstrained optimization software, TOMS 7 136—140.
- Морэ, Соренсен (Moré J. J., Sorensen D. C.)
 (1979) On the use of directions of negative curvature in a modified Newton method, Math. Prog. 16, 1—20.
- Мюррей (Murray W.)
 (1972) Numerical Methods for Unconstrained Optimization. Academic Press, London.
- Мюррей, Овертон (Murray W., Overton M. L.)
 (1980) A projected Lagrangian algorithm for nonlinear minimax optimization, SIAM J. Sci. Statist. Comput. 1, 345—370.
 (1981) A projected Lagrangian algorithm for nonlinear l_1 optimization, SIAM J. Sci. Statist. Comput. 2, 207—224.
- Нелдер, Мид (Nelder J. A., Mead R.)
 (1965) A simplex method for function minimization, Comput. J. 7, 308—313.
- Орен (Oren S. S.)
 (1974) On the selection of the parameters in self-scaling variable metric algorithms, Math. Prog. 7, 351—367.
- Ортега, Рейнболдт (Ortega J. M., Rheinboldt W. C.)
 (1970) Iterative Solution of Nonlinear Equations in Several Variables. Academic Press, New York. [Имеется перевод: Ортега Дж., Рейнболдт В. Итерационные методы решения нелинейных систем уравнений со многими неизвестными. — М.: Мир, 1975.]
- Осборн (Osborne M. R.)
 (1976) Nonlinear least squares — the Levenberg algorithm revisited, J. Austral. Math. Soc. 19 (Series B), 343—357.
- Пауэлл (Powell M. J. D.)
 (1970a) A hybrid method for nonlinear equations, in Numerical Methods for Nonlinear Algebraic Equations, ed. by Rabinowitz P., Gordon and Breach, London, 87—114.
 (1970b) A new algorithm for unconstrained optimization, in Nonlinear Programming, ed. by Rosen J. B., Mangasarian O. L. and Ritter K., Academic Press, New York, 31—65.
 (1975) Convergence properties of a class of minimization algorithms, in Nonlinear Programming 2, ed by Mangasarian O. L., Meyer R. and Robinson S., Academic Press, New York, 1—27.
 (1976) Some global convergence properties of variable metric algorithm without exact line searches, in Nonlinear Programming, ed. by Cottle R. and Lemke C., AMS, Providence, R. I., 53—72.
 (1981) A note on quasi-Newton formulae for sparse second derivative matrices, Math. Prog. 20, 144—151.
- Пауэлл, Тoint (Powell M. J. D., Toint Ph. L.)
 (1979) On the estimation of sparse Hessian matrices, SIAM J. Numer. Anal. 16, 1060—1074.
- Пратт (Pratt J. W.)
 (1977) When to stop a quasi-Newton search for a maximum likelihood estimate, Harvard School of Business WP 77—16.
- Райд (Reid J. K.)
 (1973) Least squares solution of sparse systems of non-linear equations by a modified Marquardt algorithm, in Proc. NATO Conf. at Cambridge, July 1972, North-Holland, Amsterdam, 437—445.
- Райнш (Reinsch C.)
 (1971) Smoothing by spline functions, II, Numer. Math. 16, 451—454.

- Соренсен (Sorensen D. C.)
 (1977) Updating the symmetric indefinite factorization with applications in a modified Newton's method, PH. D. Thesis, U. C. San Diego, Argonne National Labs Report ANL-77-49.
 (1982) Newton's method with a model trust region modification, SIAM J. Numer. Anal. 19, 409—426.
- Стренг (Strang G.)
 (1976) Linear Algebra and Its Applications, Academic Press, New York. [Имеется перевод: Стренг Г. Линейная алгебра и ее приложения. — М.: Мир, 1980.]
- Стюарт (Stewart G. W., III)
 (1967) A modification of Davidson's method to accept difference approximations of derivatives, J. ACM 14, 72—83.
 (1973) Introduction to Matrix Computations, Academic Press, New York.
- Тоинт (Toint Ph. L.)
 (1977) On sparse and symmetric matrix updating subject to a linear equation, Math. Comp. 31, 954—961.
 (1978) Some numerical results using a sparse matrix updating formula in unconstrained optimization, Math. Comp. 32, 839—851.
 (1981) A sparse quasi-Newton update derived variationally with a non-diagonally weighted Frobenius norm, Math. Comp. 37, 425—434.
- Уилкинсон (Wilkinson J. H.)
 (1963) Rounding Errors in Algebraic Processes, Prentice-Hall, Englewood Cliffs, N. J.
 (1965) The Algebraic Eigenvalue Problem, Oxford University Press London. [Имеется перевод: Уилкинсон Дж. Алгебраическая проблема собственных значений. — М.: Наука, 1970.]
- Флетчер (Fletcher R.)
 (1970) A new approach to variable metric algorithms, Comput. J. 13, 317—322.
 (1980) Practical Methods of Optimization, Vol. 1, Unconstrained Optimization, John Wiley & Sons, New York.
- Флетчер, Пауэлл (Fletcher R., Powell M. J. D.)
 (1963) A rapidly convergent descent method for minimization, Comput. J. 6, 163—168.
- Форд (Ford B.)
 (1978) Parameters for the environment for transportable numerical software, TOMS 4, 100—103.
- Фосдик (Fosdick L. ed.)
 (1979) Performance Evaluation of Numerical Software, North-Holland, Amsterdam.
- Фрэнк, Шнабель (Frank P., Schnabel R. B.)
 (1982) Calculation of the initial Hessian approximation in secant algorithms, in preparation.
- Хайберт (Hiebert K. L.)
 (1982) An evaluation of mathematical software that solves systems of nonlinear equations, TOMS 8, 5—20.
- Хебден (Hebden M. D.)
 (1973) An algorithm for minimization using exact second derivatives, Rept. TP515, A. E. R. E., Harwell, England.
- Хемминг (Hamming R. W.)
 (1973) Numerical Methods for Scientists and Engineers, 2 ed., McGraw-Hill, New York. [Имеется перевод первого издания: Хемминг Р. В. Численные методы для научных работников и инженеров. — М.: Наука, 1979.]
- Хестенс (Hestenes M. R.)
 (1980) Conjugate-direction Methods in Optimization, Springer Verlag, New York.

- Хьюбер (Huber P. J.)
 (1973) Robust regression: asymptotics, conjectures, and Monte Carlo, *Annals of Statistics* 1, 799—821.
 (1981) Robust Statistics, John Wiley & Sons, New York. [Имеется перевод: Хьюбер Дж. П. Робастность в статистике. — М.: Мир, 1984.]
- Шанно (Schanno D. F.)
 (1970) Conditioning of quasi-Newton methods for function minimization, *Math. Comp.* 24, 647—657.
 (1978) Conjugate-gradient methods with inexact searches, *Math. of Oper. Res.* 3, 244—256.
 (1980) On the variable metric methods for sparse Hessians, *Math. Comp.* 34, 499—514.
- Шанно, Фун (Schanno D. F., Phua K. H.)
 (1978a) Matrix conditioning and nonlinear optimization, *Math. Prog.* 14, 145—160.
 (1978b) Numerical comparison of several variable metric algorithms, *J. Optim. Theory Appl.* 25, 507—518.
- Шнабель (Schnabel R. B.)
 (1977) Analysing and improving quasi-Newton methods for unconstrained optimization, Ph. D. Thesis, Cornell Computer Science TR-77-320.
 (1982) Convergence of quasi-Newton updates to correct derivative values, in preparation.
- Шнабель, Вайс, Кунц (Schnabel R. B., Weiss B. E., Koontz J. E.)
 (1982) A modular system of algorithms for unconstrained minimization, *Univ. Colorado Computer Science*, TR CU-CS-240-82.
- Штайхауг (Steihaug T.)
 (1981) Quasi-Newton methods for large scale nonlinear problems, Ph. D. Thesis, Yale University.
- Шуберт (Schubert L. K.)
 (1970) Modification of a quasi-Newton method for nonlinear equations with a sparse Jacobian, *Math. Comp.* 24, 27—30.
- Шульц, Шнабель, Бирд (Shultz G. A., Schnabel R. B., Byrd R. H.)
 (1982) A family of trust region based algorithms for unconstrained minimization with strong global convergence properties, *Univ. Colorado Computer Science* TR CU-CS-216-82.

Добавлено при переводе

- Бахвалов Н. С., Жидков Н. П., Кобельков Г. М.
 (1987) Численные методы: учебное пособие для вузов. — М.: Наука.
- Васильев Ф. П.
 (1980) Численные методы решения экстремальных задач. — М.: Наука.
- Евтушенко Ю. Г.
 (1982) Методы решения экстремальных задач и их применение в системах оптимизации. — М.: Наука.
- Марчук Г. И., Лебедев В. И.
 (1971) Численные методы теории переноса нейтронов. — М.: Атомиздат.
- Михалевич В. С., Гупал А. М., Норкин В. И.
 (1987) Методы невыпуклой оптимизации. — М.: Наука.
- Поляк Б. Т.
 (1983) Введение в оптимизацию. — М.: Наука.
- Пшеничный Б. Н., Данилин Ю. М.
 (1975) Численные методы в экстремальных задачах. — М.: Наука.
- Самарский А. А., Николаев Е. С.
 (1978) Методы решения сеточных уравнений. — М.: Наука.
- Сухарев А. Г., Тимохов А. В., Федоров В. В.
 (1986) Курс методов оптимизации. — М.: Наука.

432 Литература

Shub M., Smale S.

(1985) Computational complexity: on the geometry of polynomials and a theory of cost; Part I, Ann. Sci. Ecole Norm. Sup. 4 serie t. 18, pp. 107—142.

(1986) Computational complexity: on the geometry of polynomials and a theory of cost; Part II, SIAM J. Computing, Vol. 15 (1986), pp. 145—161.

Smale S.

(1985) On the efficiency of algorithms of analysis, Bull. Amer. Math. Soc. (N. S.) 13 (1985), pp. 87—121.

(1986a) Newton's method estimates from data at one point, Mathematical Sciences Research Institute, Berkeley, California (April), 16 p.

(1986b) Algorithms for solving equations, Intern. Congress of Math., Berkeley, 43 p.