
REFERENCE

- [1] Stubbs, N. and Osegueda, R., "Global damage detection in solids - experimental verification," International Journal of Analytical and Experimental Modal Anal., 5(2), pp. 81-89, 1990.
- [2] Stubbs, N., et al., "Health monitoring of tree-like structures using modal parameters," Proc., ASME NDE Engrg. Div. Topical Conf., 1992.
- [3] Stubbs, N. and Topole, K. G., "A damage localization algorithm for nonlinear structures," in Safety evaluation based on identification approached related to time-variant and nonlinear structures, T. H. G. Natke, G. R., and Yao, J. T. P., Ed.: Freidrich Vieweg & Sohn Verlagsgesellschaft GmbH, 1993, pp. 93-106.
- [4] Kim, J. T. and Stubbs, N., "Damage detection in offshore jacket structures from limited modal information," International Journal of Offshore and Polar Engineering, 5(1), pp. 58-66, 1995.
- [5] Wen, Y. K., "Intelligent structures 2: monitoring and control," Proc., International Workshop on Intelligent Sys., New York, N. Y., 1992.
- [6] Hu, N., et al., "Damage assessment of structures using modal test data," International Journal of Solids and Structures, 38(18), pp. 3111-3126, 2001.
- [7] Kahl, K. and Sirkis, J. S., "Damage detection in beam structures using subspace rotation algorithm with strain data," AIAA Journal, 34(12), pp. 2609-2614, 1996.
- [8] Berman, A. and Nagy, E. J., "Improvement of a large analytical model using test data," AIAA Journal, 21(8), pp. 1168-1173, 1983.
- [9] Levine-West, M., et al., "Mode shape expansion techniques for prediction: experimental evaluation," AIAA Journal, 34(4), pp. 821-829, 1996.
- [10] Masri, S. F., et al., "Structure-unknown nonlinear dynamic systems: identification through neural networks," Smart Materials and Structures, 1(pp. 45-46, 1992.
- [11] Masri, S. F., et al., "Neural network approach to the detection of changes in
-

- structural parameters," Journal of Engineering Mechanics, ASCE, 122(4), pp. 350-360, 1996.
- [12] Nakamura, M., et al., "A method for non-parametric damage detection through the use of neural networks," Earthquake Engineering and Structural Dynamics, 27(9), pp. 997-1010, 1998.
- [13] Huang, C. S., et al., "A neural network approach for structural identification and diagnosis of a building from seismic response data," Earthquake Engineering and Structural Dynamics, 32(2), pp. 187-206, 2003.
- [14] Salawu, O. S., "Detection of structural damage through changes in frequency: a review," Engineering Structures, 19(9), pp. 718-723, 1997.
- [15] Alampalli, S. and Fu, G. K., "Full scale dynamic monitoring of highway bridges," Structural Engineering in Natural Hazards Mitigation, 1(pp. 1602-1607, 1993.
- [16] Salawu, O. S. and Williams, C., "Bridge assessment using forced-vibration testing," Journal of Structural Engineering, ASCE, 121(2), pp. 161-173, 1995.
- [17] West, W. M., "Illustration of the use of modal assurance criterion to detect structural changes in an orbiter test specimen," Proc., 4th International Modal Analysis Conference, 1986.
- [18] Lieven, N. A. J. and Ewins, D. J., "Spatial correlation of mode shapes, the coordinate modal assurance criterion (COMAC)," Proc., 5th International Modal Analysis Conference, 1988.
- [19] Biswas, M., et al., "Diagnosis experiment spectral/modal analysis of highway bridges," The International Journal of Analytical and Experimental Modal Analysis, 5(1), pp. 33-42, 1990.
- [20] Cawley, P. and Adams, R. D., "The location of defects in structures from measurements of natural frequencies," Journal of Strain Analysis, 14(2), pp. 49-57, 1979.
- [21] Penny, J. E. T., et al., "Damage location in structures using vibration data," Proc., 11th International Modal Analysis Conference, Kissimee, FL., 1993.
- [22] Contursi, T., et al., "A multiple-damage location assurance criterion based on natural frequency changes," Journal of Vibration and Control, 4(5), pp. 619-663, 1998.
-

-
- [23] Hearn, G. and Testa, R. B., "Modal analysis for damage detection in structures," Journal of Structural Engineering, ASCE, 117(10), pp. 3042-3063, 1991.
- [24] Shi, Z. Y., et al., "Structural damage localization from modal strain energy change," Journal of Sound and Vibration, 218(5), pp. 825-844, 1998.
- [25] Shi, Z. Y., et al., "Structural damage detection from modal strain energy change," Journal of Engineering Mechanics, ASCE, 126(12), pp. 1216-1223, 2000.
- [26] Zimmermann, D. C. and Kaouk, M., "Structural damage detection using a subspace rotation algorithm," Proc. AIAA 33rd Structures, Structural Dynamics, and Materials Conference, Dallas, TX, 1992.
- [27] Lim, T. W. and Kashangaki, T. A. L., "Structural damage detection of space truss structures using best achievable eigenvectors," AIAA Journal, 32(5), pp. 1049-1057, 1994.
- [28] Yao, G. C., et al., "Damage diagnosis of steel frames using vibrational signature analysis," Journal of Engineering Mechanics, ASCE, 118(9), pp. 1949-1961, 1992.
- [29] Stubbs, N. and Kim, J. T., "Damage localization in structures without baseline modal parameters," AIAA Journal, 34(8), pp. 1644-1649, 1996.
- [30] Topole, K. G. and Stubbs, N., "Non-destructive damage evaluation of a structure from limited modal parameters," Earthquake Engineering and Structural Dynamics, 24(12), pp. 1427-1436, 1995.
- [31] Messina, A., et al., "Damage detection and localisation using natural frequency changes," Proc., Identification in Engineering Systems, Swansea, Wales, 1996.
- [32] Messina, A., et al., "Structural damage detection by a sensitivity and statistical-based method," Journal of Sound and Vibration, 216(5), pp. 791-808, 1998.
- [33] Shi, Z. Y., et al., "Damage localization by directly using incomplete mode shapes," Journal of Engineering Mechanics, ASCE, 126(6), pp. 656-660, 2000.
- [34] Lin, C. S., "Location of modeling errors using modal test data," AIAA Journal, 33(9), pp. 1650-1654, 1995.
- [35] Pandey, A. K. and Biswas, M., "Damage diagnosis of truss structures by estimation of flexibility change," International Journal of Analytical and
-

- Experimental Modal Anal, 10(2), pp. 104-117, 1995.
- [36] Pandey, A. K., et al., "Damage detection from changes in curvature mode shapes," Journal of Sound and Vibration, 145(2), pp. 321-332, 1991.
- [37] Cornwell, P., et al., "Application of the strain energy damage detection method to plate-like structures," Journal of Sound and Vibration, 224(2), pp. 359-374, 1999.
- [38] Ratcliffe, C. P., "Damage detection using a modified Laplacian operator on mode shape data," Journal of Sound and Vibration, 204(3), pp. 505-517, 1997.
- [39] Wahab, M. M. A. and Roeck, D. D., "Damage detection in bridges using modal curvatures: application to a real damage scenario," Journal of Sound and Vibration, 226(2), pp. 217-235, 1999.
- [40] Ricles, J. M. and Kosmatka, J. B., "Damage detection in elastic structures using vibratory residual forces and weighted sensitivity," AIAA Journal, 30(9), pp. 2310-2316, 1992.
- [41] Kosmatka, J. B. and Ricles, J. M., "Damage detection in structures by modal vibration characterization," Journal of Structural Engineering, ASCE, 125(12), pp. 1384-1392, 1999.
- [42] Zimmermann, D. C. and Kaouk, M., "Structural damage detection using a minimum rank update theory," Journal of Vibration and Acoustics, ASME, 116(pp. 222-231, 1994.
- [43] Kaouk, M. and Zimmermann, D. C., "Structural damage assessment using a generalized minimum rank perturbation theory," AIAA Journal, 32(4), pp. 836-842, 1994.
- [44] Koh, C. G., et al., "Damage detection of buildings: numerical and experimental studies," Journal of Structural Engineering, ASCE, 121(8), pp. 1155-1160, 1995.
- [45] Shi, Z. Y., et al., "Improved damage quantification from elemental modal strain energy change," Journal of Engineering Mechanics, ASCE, 128(5), pp. 521-529, 2002.
- [46] Golden, R. M., Mathematical methods for neural network analysis and design. MIT Press, Cambridge, MA., 1996.
- [47] Adeli, H. and Hung, S. L., "A fuzzy neural network learning model for image

-
- recognition," Integrated Computer-Aided Engineering, 1(1), pp. 43-55, 1993.
- [48] Adeli, H. and Hung, S. L., Machine Learning- Neural Networks, Genetic Algorithms, and Fuzzy Systems. John Wiley & Sons, New York, NY, 1995.
- [49] Adeli, H. and Park, H. S., Neurocomputing in design automation CRC Press, Boca Raton, FL, 1998.
- [50] Haykin, S., Neural networks: a comprehensive foundation. Prentice-Hall, Englewood Cliffs, NJ., 1999.
- [51] Lim, T. W., et al., "On-line identification of modal parameters using artificial neural networks," Journal of Vibration and Acoustics, ASME, 118(10), pp. 649-656, 1996.
- [52] Masri, S. F., et al., "Identification of nonlinear dynamic systems using neural networks," Journal of Applied Mechanics, 60(pp. 123-133, 1993.
- [53] Chen, H. M., et al., "Neural network for structural dynamic model identification," Journal of Engineering Mechanics, ASCE, 121(12), pp. 1377-1381, 1995.
- [54] Chen, H. M., et al., "Neural network for structure control," Journal of Computing In Civil Engineering, ASCE, 9(2), pp. 168-176, 1995.
- [55] Chassiakos, A. G. and Masri, S. F., "Modeling unknown structural system through the use of neural networks," Earthquake Engineering and Structural Dynamics, 25(2), pp. 117-128, 1996.
- [56] Huang, C. C. and Loh, C. H., "Nonlinear identification of dynamic systems using neural networks," Computer-Aided Civil and Infrastructure Engineering, 16(1), pp. 28-41, 2001.
- [57] Nerrand, O., et al., "Neural networks and nonlinear adaptive filtering: unifying concepts and new algorithms," Neural Computing, 5(2), pp. 165-199, 1993.
- [58] Sjoberg, J., et al., "Nonlinear black-box modeling in system identification: a unified overview," Automatica, 31(12), pp. 1691-1724, 1995.
- [59] Ghaboussi, J., et al., "Knowledge-based modeling of material behavior with neural networks," Journal of Engineering Mechanics, ASCE, 117(1), pp. 132-153, 1991.
- [60] Wu, X., et al., "Use of neural networks in detection of structural damage,"
-

- Computers and Structures, 42(4), pp. 649-659, 1992.
- [61] Elkordy, M. F., et al., "Neural networks trained by analytically simulated damage states," Journal of Computing In Civil Engineering., ASCE, 7(2), pp. 130-145, 1993.
- [62] Szewczyk, P. and Hajela, P., "Damage detection in structures based on feature-sensitive neural network," Journal of Computing In Civil Engineering., ASCE, 8(2), pp. 163-178, 1994.
- [63] Pandey, P. C. and Barai, S. V., "Multilayer perceptron in damage detection of bridge structures," Computers and Structures, 54(4), pp. 597-608, 1995.
- [64] Pandey, P. C. and Barai, S. V., "Time-delay neural networks in damage detection of railway bridges," Advance in Engineering Software, 28(1), pp. 1-10, 1997.
- [65] Zhao, J., et al., "Structural damage detection using artificial neural networks," Journal of Infrastructure Systems, ASCE, 4(2), pp. 93-101, 1998.
- [66] Masri, S. F., et al., "Application of neural networks for detection of changes in nonlinear systems," Journal of Engineering Mechanics, ASCE, 126(7), pp. 666-676, 2000.
- [67] Zapico, J. L., et al., "Vibration-based damage assessment in steel frames using neural networks," Smart Materials and Structures, 10(3), pp. 553-559, 2001.
- [68] Sahin, M. and Sheno, R. A., "Quantification and localisation of damage in beam-like structures by using artificial neural networks with experimental validation," Engineering Structures, 25(14), pp. 1785-1802, 2003.
- [69] Kim, S. H., et al., "Structural monitoring system based on sensitivity analysis and a neural network," Computer-Aided Civil and Infrastructure Engineering, 15(4), pp. 309-318, 2000.
- [70] Marwala, T., "Damage identification using committee of neural networks," Journal of Engineering Mechanics, ASCE, 126(1), pp. 43-50, 2000.
- [71] Yun, C. B., et al., "Joint damage assessment of framed structures using a neural networks technique," Engineering Structures, 23(5), pp. 425-435, 2001.
- [72] Ni, Y. Q., et al., "Constructing input vectors to neural networks for structural damage identification," Smart Material and Structures, 11(pp. 825-833, 2002.

-
- [73] Tsai, C. H. and Hsu, D. S., "Diagnosis of reinforced concrete structural damage based on displacement time history using the back-propagation neural network technique," Journal of Computing In Civil Engineering., ASCE, 16(1), pp. 49-58, 2002.
- [74] Wu, Z., et al., "Decentralized parameteric damage detection based on neural networks," Computer-Aided Civil and Infrastructure Engineering, 17(pp. 175-184, 2002.
- [75] McCulloch, W. and Pitts, W., "A logical calculus of ideas imminent in nervous activity," Bulletin of Mathematical Biophysics, 5(pp. 115-133, 1943.
- [76] Rosenblatt, F., "The perceptron: a probabilistic model for information storage and organization in the brain," Psychological Review, 65(pp. 386-408, 1958.
- [77] Adeli, H. and Saleh, A., Control, optimization, and smart structures: high-performance bridges and buildings of the future. John Wiley & Sons, New York, NY, 1999.
- [78] Adeli, H., "Neural network in civil engineering: 1989-2000," Compter-Aided Civil and Infrastructure Engineering, 16(2), pp. 126-142, 2001.
- [79] Rumelhart, D. E., et al., "Learning international representation by error propagation," in *Parallel Distributed Processing*, R. J. Williams, Ed. Cambridge, MA.: The MIT Press, 1986, pp. 318-362.
- [80] Hecht-Nielsen, R., "Theory of the back propagation neural network," *Proceedins of International Joint Conference on Neural Network*, IEEE, 1989.
- [81] Hung, S. L. and Lin, Y. L., "Application of an L-BFGS Neural Network Learning Algorithm in Engineering Analysis and Design," *Proc., The 2nd National Conf. on Struct. Engrg., Taiwan, R.O.C., 1994.*
- [82] Nocedal, J., "Updating quasi-Newton matrix with limited storage," Math. Computation, 35(pp. 20-33, 1980.
- [83] Hung, S. L. and Jan, J. C., "Machine learning in engineering design: an unsupervised fuzzy neural network learning model," *Proc. of Intelligent Information Systems*, IEEE Computer Society, California, 1997.
- [84] Hung, S. L. and Jan, J. C., "Machine learning in engineering analysis and design: an integrated fuzzy neural network learning model," Computer-Aided Civil and Infrastructure Engineering, 14(pp. 207-219, 1999.
-

-
- [85] Hung, S. L. and Jan, J. C., "Augmented IFN Learning Model," Journal of Computing in Civil Engineering, ASCE, 14(1), pp. 15-22, 2000.
- [86] Hung, S. L. and Lai, C. M., "Unsupervised fuzzy neural network structural active pulse controller," Earthquake Engineering and Structural Dynamics, 30(4), pp. 465-484, 2001.
- [87] Wen, C. M. and Hung, S. L., "Unsupervised fuzzy neural network for the damage detection of structures," (Submitted to Earthquake Engineering and Structural Dynamics), 2004.
- [88] Jan, J. C., "The development of neural network machine learning models: preliminary design in building structure," in *Dept. of Civil Engineering*. Hsinchu, Taiwan: National Chiao Tung University, 2000.
- [89] Maia, N. M. M., et al., Theoretical and experimental modal analysis. Research Studies Press, Ltd., Baldock, Hertfordshire, England, 1997.
- [90] He, J. and Fu, Z. F., Modal analysis. Butterworth-Heinemann, Woburn, MA, 2001.
- [91] Yun, C. B. and Bahng, E. Y., "Substructural identification using neural networks," Computers and Structures, 77(1), pp. 41-52, 2000.
- [92] Huang, C. S., "Structural identification from ambient vibration measurement using the multivariate AR model," Journal of Sound and Vibration, 241(3), pp. 337-359, 2001.
- [93] Huang, C. S., "A study on techniques for analyzing ambient vibration measurement (II) - time series methods," National Center for Research on Earthquake Engineering, Taiwan, R.O.C NCREE Report No. NCREE-99-018, 1999.
- [94] Yeh, S. C., et al., "Shaking table tests on scaled down five-story steel structures," National Center for Research on Earthquake Engineering, Taiwan, R.O.C. NCREE Reprot No. NCREE-99-002, 1999.
- [95] Allemang, R. L. and Brown, D. L., "A correlation coefficient for modal vector analysis," Proceeding of the first International Modal Analysis Conference, Bethel, Connecticut, U.S.A., 1983.
- [96] Trifunac, D., "Comparisons between ambient and forced vibration experiments," Earthquake Engineering and Structural Dynamics, 1(pp. 133-150,
-

- 1972.
- [97] Huang, C. S. and Lin, H. L., "Modal identification of structures from ambient vibration, free vibration, and seismic response data via a subspace approach," Earthquake Engineering and Structural Dynamics, 30(12), pp. 1857-1878, 2001.
- [98] Inman, D. J., "Dynamics of asymmetric nonconservative systems," Journal of Applied Mechanics, ASME, 50(pp. 199-203, 1983.
- [99] Fox, R. L. and Kapoor, M. P., "Rate of change of eigenvalues and eigenvectors," AIAA Journal, 6(pp. 2426-2429, 1968.
- [100] Lam, H. F., et al., "Localization of damaged structural connections based on experimental modal and sensitivity analysis," Journal of Sound and Vibration, 210(1), pp. 91-115, 1998.
- [101] Shi, Z. Y., et al., "Optimum sensor placement for structural damage detection," Journal of Engineering Mechanics, ASCE, 126(11), pp. 1173-1179, 2000.
- [102] Law, S. S., et al., "Efficient numerical model for the damage detection of large scale engineering structures," Engineering Structures, 23(5), pp. 436-451, 2001.
- [103] Chen, H. L., et al., "Evaluating structural deterioration by dynamic response," Journal of Structural Engineering, ASCE, 121(8), pp. 1197-1204, 1995.
- [104] Stubbs, N. and Garcia, G., "Application of pattern recognition to damage localization," Microcomputers in Civil Engineering, 11(pp. 395-409, 1996.
- [105] Abdalla, M. O., et al., "Structural damage detection using linear matrix inequality methods," Journal of Vibration and Acoustics, ASME, 122(10), pp. 448-455, 2000.
- [106] Titurus, B., et al., "Damage detection using generic elements: part I. model updating," Computers and Structures, 81(24-25), pp. 2273-2286, 2003.
- [107] Titurus, B., et al., "Damage detection using generic elements: part II. damage detection," Computers and Structures, 81(24-25), pp. 2287-2299, 2003.
- [108] Juneja, V., et al., "Damage detection and damage detectability-analysis and experiments," Journal of Aerospace Engineering, ASCE, 10(4), pp. 135-142, 1997.
- [109] Wang, Z., et al., "Structural damage detection using measured FRF data,"

- Comput. Methods Appl. Mech. Engrg., 147(1-2), pp. 187-197, 1997.
- [110] Wang, X., et al., "Structural damage identification using static test data and changes in frequencies," Engineering Structures, 23(6), pp. 610-621, 2001.
- [111] Mazurek, D. F. and Dewolf, J. T., "Experimental study of bridge monitoring technique," Journal of Structural Engineering, ASCE, 116(9), pp. 2532-2547, 1990.
- [112] Catbas, F. N. and Aktan, A. E., "Condition and damage assessment: issues and some promising indices," Journal of Structural Engineering, ASCE, 128(8), pp. 1026-1036, 2002.
- [113] Jang, J. H., et al., "Experimental investigation of system-identification-based damage assessment on structures," Journal of Structural Engineering, ASCE, 128(5), pp. 673-682, 2002.
- [114] Ndambi, J. M., et al., "Damage assessment in reinforced concrete beams using eigenfrequencies and mode shape derivatives," Engineering Structures, 24(4), pp. 501-515, 2002.
- [115] Ren, W. X. and Roeck, G. D., "Structural damage identification using modal data. I: simulation verification," Journal of Structural Engineering, ASCE, 128(1), pp. 87-95, 2002.
- [116] Ren, W. X. and Roeck, G. D., "Structural damage identification using modal data. II: test verification," Journal of Structural Engineering, ASCE, 128(1), pp. 96-104, 2002.
- [117] <http://wusceel.cive.wustl.edu/asce.shm/>.
- [118] Meltz, G., et al., "Formation of Bragg gratings in optical fiber by a transverse holographic method," Opt. Lett., 14, pp. 823-825, 1989.
- [119] Morey, W. W., et al., "Evaluation of a fiber Bragg grating hydrostatic pressure sensor," Proc. 8th International Conference on Optical Fiber Sensors, Monterey, CA, USA, 1992.
- [120] James, S. W., et al., "Independent measurement of temperature and strain using in-fibre Bragg grating sensors," Proc. 11th International Conference on Optical Fibre Sensors, Sapporo, Japan, 1996.
- [121] Theriault, S., et al., "High-g accelerometer based on an in-fibre Bragg grating sensor," Proc. 11th International Conference on Optical Fibre Sensors, Sapporo,

-
- Japan, 1996.
- [122] Rao, Y. J., "Recent progress in applications of in-fibre Bragg grating sensors," Optics and Lasers in Engineering, 31(4), pp. 297-324, 1999.
- [123] Othonos, A. and Kalli, K., Fiber Bragg gratings: fundamentals and applications in telecommunications and sensing. Artech House, Boston, Mass., 1999.
- [124] Kashyap, R., Fiber Bragg gratings. Academic Press, San Diego, CA, 1999.
- [125] Rao, Y. J., "In-fibre Bragg grating sensors," Measurement Science and Technology, 8(4), pp. 355-375, 1997.
- [126] Banks, H. T., et al., "An experimentally validated damage detection theory in smart structures," Journal of Sound and Vibration, 191(5), pp. 859-880, 1996.
- [127] Sohn, H. and Law, K. H., "Damage diagnosis using experimental Ritz vectors," Journal of Engineering Mechanics, ASCE, 127(11), pp. 1184-1193, 2001.
- [128] Xia, Y., et al., "Damage identification of structures with uncertain frequency and mode shape data," Earthquake Engineering and Structural Dynamics, 31(5), pp. 1053-1066, 2002.
- [129] Casas, J. R. and Aparicio, A. C., "Structural damage identification from dynamic-test data," Journal of Structural Engineering, ASCE, 120(8), pp. 2437-2450, 1994.
- [130] Thyagarajan, S. K., et al., "Detecting structural damage using frequency response functions," Journal of Sound and Vibration, 210(1), pp. 162-170, 1998.
- [131] Worden, K. and Burrows, A. P., "Optimal sensor placement for fault detection," Engineering Structures, 23(8), pp. 885-901, 2001.
-

