References

- Adams, J. A. (1971). A closed-loop theory of motor learning. *Journal of Motor Behavior*, 3:111–150.
- Askenfelt, A. and Jansson, E. (1992). On vibration sensation and finger touch in stringed instrument playing. *Music Perception*, 9(3):311–349.
- Bhushan, N. and Shadmehr, R. (In Press). Architecture of the Human Adaptive Controller in Learning Dynamics of Reaching Movements. Cambridge, M.A.: MIT Press.
- Bockholt, U., Ecke, U., Muller, W., and Voss, G. (1999). Realtime simulation of tissue deformation for the nasal endoscopy simulator (nes). In J. Westwood, H. Hoffman, R. Robb, and D. Stredney, editors, *Medicine Meets Virtual Reality*, pp. 74–75, Amsterdam, Netherlands. IOS Press.
- Bolanowski, S. J., Gescheider, G. A., Verrillo, R. T., and Checkosky, C. M. (1988). Four channels mediate the mechanical aspects of touch. *Journal of the Acoustical Society of America*, 84(5):1680–1694.
- Bongers, B. (1994). The use of active tactile and force feedback in timbre controlling electronic instruments. In *Proceedings of the International Computer Music* Conference, pp. 171–174. International Computer Music Conference.
- Bryan, W. L. and Harter, N. (1897). Studies in the physiology and psychology of the telegraphic language. *Psychological Review*, 4:27–53.

Bryan, W. L. and Harter, N. (1899). Studies on the telegraphic language. *Psychological Review*, 6:345–375.

- Cadoz, C. (1988). Instrumental gesture and musical composition. In *Proceedings of the International Computer Music Conference*, pp. 1–12.
- Cadoz, C., Lisowski, L., and Florens, J. (1990). Modular feedback keyboard. In S. Arnold and G. Hair, editors, *International Computer Music Conference*, pp. 379–382, Glasgow. Computer Music Association, ICMC Glasgow 1990.
- Chafe, C. (1988). Simulating performance on a bowd instrument. Tech. Rep. Stan-M-48, Stanford University.
- Chafe, C. (1993). Tactile audio feedback. In *Proceedings of the ICMC*. ICMC.
- Chafe, C. and O'Modhrain, S. (1996). Musical muscle memory and the haptic display of performance nuance. In *International Computer Music Conference*, Menlo Park, CA.
- Christ, R. E. (1975). Review and analysis of color coding research for visual displays. Human Factors, 17(6):542–570.
- Chu, L. (1996). Haptic feedback in computer music performance. In *Proceedings of the ICMC*, pp. 57–58. ICMC.
- Cook, P. R. and Scavone, G. (1998). The synthesis toolkit (STK). In *Proceedings of the ICMC*, pp. 164–166. International Computer Music Conference.
- Dahl, P. (1976). Solid friction damping of mechanical vibrations. AIAA journal, 14(2):1675–1682.
- Evarts, E. X. (1973). Motor cortex reflexes associated with learned movement. *Science*, 179:501–503.
- Fitts, P. and Posner, M. I. (1967). Human Performance. Belmont, CA: Brooks/Cole.

Fitts, P. M. (1964). *Perceptual-Motor Skills Learning*, pp. 243–285. New York: Academic Press.

- Frost, B. J. and Richardson, B. L. (1976). Tactile localization of sounds: Acuity, tracking moving sources, and selective attention. *Journal of the Acoustical Society of America*, 59(4):907–914.
- Gescheider, G., Sager, L., and Ruffolo, L. (1975). Simultaneous auditory and tactile information processing. *Perception and Psychophysics*, 18(3):209–216.
- Gibet, S. and Florens, J. (1988). Instrumental gesture modeling by identification with time-varying mechanical models. In *Proceedings of the ICMC*, pp. 28–40. International Computer Music Conference.
- Gillespie, B. (1996). Haptic Displays of Systems with Changing Kinematic Constraints: The Virtual Piano Action. Ph.D. thesis, Dept. of Mech. Eng., Stanford University. Available as Stanford University Department of Music Technical Report STAN-M-92.
- Gillespie, R. B., O'Modhrain, M. S., Tang, P., Zaretzky, D., and Pham, C. (1998). The virtual teacher. In *Dynamic Systems and Controls*, vol. 64, pp. 171–178. ASME.
- Green, D. (1999). Haptic simulation of naturally occurring textures and soil properties.

 Master's thesis, MIT, Cambridge, MA.
- Hasser, C., Goldenberg, A., Martin, K., and Rosenberg, L. (1998). User performance in a gui pointing task with a low-cost force-feedback computer mouse. In R. Furness, editor, *Proceedings of ASME WAM DSC*, pp. 151–156, New York. ASME.
- Hasser, C. J. and Massie, T. (1997). The haptic illusion. In C. Dodsworth, editor, Digital Illusion, pp. 287–310. New York: Addison Wesley Pub. Co Inc.
- Hayward, V. and Armstrong, B. (1997). A new computational model of friction applied to haptic rendering. In *Proceedings of ASME WAM DSC*. ASME WAM DSC.

Henmi, K. and Yoshikawa, T. (1998). Virtual lesson and its application to virtual calligraphy system. In *International Conference on Robotics and Automation*, pp. 1275–1279, Leuven, Belgium.

- Huron, D. and Berec, J. (1995). The influence of performance physiology on musical organization: A case study of idiomaticism and the b-flat valve trumpet. Presented at the Annual Conference of the Society for Music Perception and Cognition.
- Jansson, E. e. a. (1970). Resonances of a violin body studied by hologram interferometry and acoustical methods. *Physica Scripta*, 2(6):243–256.
- Kalmeman, D. (1973). Attention and Effort. Englewood Cliffs, NJ.: Prentice-Hall.
- Kaufmann, C., Rhee, P., and Burris, D. (1998). Telepresence surgery system enhances medical student surgery training. In J. Westwood, H. Hoffman, D. Stredney, and R. Robb, editors, *Proceedings of Medicine Meets Virtual Reality 6.*, pp. 174–178, Amsterdam, Netherlands. IOS Press.
- Kawamura, S., Ida, M., Wada, T., and Wu, J.-L. (1995). Development of a virtual sports machine using a wire drive system-a trial of virtual tennis. 1:111–116.
- Keele, S. W. (1973). Attention and Human Performance. Pacific Palisades, CA.: Goodyear.
- Kellogg, R. S., Kennedy, R. S., and Woodruff, R. (1984). Comparison of color versus black-and-white visual displays as indicated by bombing and landing performance in the 2b35 ta-4j flight simulator. Tech. rep., University of Dayton Research Institution, Dayton, Ohio. Tech Rpt 84-22 (18p).
- Kontarinis, D. A. and Howe, R. D. (1995). Tactile display of vibratory information in teleoperation and virtual environments. *Presence*, 4(4):387–402.
- Koprowski, R. and Barth, G. (2000). Rubato in rosenthal's recordings of chopin's mazerkas. Personal Communication.

Kugler, P. N. and Turvey, M. T. (1987). Information, Natural Law and the Self-assembly of Rhythmic Movement. Hilsdale, NJ.: Erlbaum.

- Lashley, K. (1942). The problem of cerebral organization in vision. In L. Jeffress, editor, *Biological symposia*, *Vol. VII. Visual mechanisms*, pp. 301–322. Jaques Cattell Press.
- Lederman, S. J. and Klatzky, R. L. (1997). Haptic aspects of motor control. In M. Jeannerod, editor, *Handbook of Neurophysiology*, vol. 11, pp. 131–148. Amsterdam: Elsevier.
- Loomis, J. M. (1992). Distal attribution and presence. *Presence*, 1(1):113–119.
- MacKenzie, S. (1992). Fitts' law as a research and design tool in human-computer interaction. *Human-Computer Interaction*, 7:91–139.
- McIntyre, M. E., Schumacher, R. T., and Woodhouse, J. (1983). On the oscillations of musical instruments. *Journal of the Acoustical Society of America*, 74(5):1325–1345.
- McMillen, K. (1994). Zipi: Origins and motivations. Computer Music Journal, 18(4):47–51.
- O'Modhrain, M. S. and Gillespie, R. B. (1996). The moose: A haptic user interface for blind persons. In *The third WWW6 Conference*, Santa Clara, California.
- O'Toole, O., Playter, R., Krummel, T., Blank, W., Cornelius, N., Roberts, W., Bell, W., and Raibert, M. (1998). Assessing skill and learning in surgeons and medical students using a force feedback surgical simulator. In W. Wells, A. Colchester, and S. Delp, editors, *Proceedings of the first International Conference on Medical Image Computing and Computer-Assisted Intervention*, pp. 899–909, Berlin, Germany. Springer-Verlag.
- Palmer, C. (1997). Monitoring and planning capacities in the acquisition of music performance skills. Canadian Journal of Experimental Psychology, 51(4):369–384.

Phillips, C. G. (1977). *Brains and Hands*, chap. 4, pp. 48–58. Springfield, Ill.: C. C. Thomas. Edited by M. Critchley and R.A. Henson.

- Ramos, C. (1992). How models help us to understand interactions between posture and voluntary movements. *IEEE Eng. in Medicine and Biology Magazine*, 11(4):91–92.
- Repperger, D. W., Haas, M. W., Brickman, B. J., Hettinger, L. J., Lu, L., and Roe, M. M. (1997). Design of a haptic stick interface as a pilot's assistant in a high turbulence task environment. *Perceptual and Motor Skills*, 85(3):1139–1154.
- Richardson, B. L. and Frost, B. J. (1979). Tactile localization of the direction and distance of sounds. *Perception and Psychophysics*, 25(4):336–344.
- Roads, C. (1996). The Computer Music Tutorial. Cambridge, Mass.: MIT Press.
- Rosenberg, L. B. (1994). Virtual Fixtures: Perceptual overlays enhance operator performance in telepresence tasks. Ph.D. thesis, Dept. of Mechanical Engineering, Stanford University.
- Rovan, J. and Hayward, V. (2000). Typology of tactile sounds and their synthesis in gesture-driven computer music performance. In M. Wanderley and M. Battier, editors, *Trends in Gestural Control of Music*, pp. 297–320. Paris: Editions IRCAM.
- Schelleng, R. (1973). The bowed string and the player. JASA, 53:26-41.
- Schmidt, R. (1976). Control processes in motor skills. *Exercise and sport sciences* reviews, pp. 229–261.
- Schmidt, R. A. and Lee, T. D. (1999). *Motor Control and Learning: a Behavioral Emphasis*. Champaign, Ill.: Human Kinetics, 3rd edn.
- Serafin, S., Smith, J. I., and Woodhouse, J. (1999). An investigation of the impact of torsion waves and friction characteristics on the playability of virtual bowed strings. In *Proceedings of the 1999 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, pp. 87–90, Pitcataway, NJ. WASPAA, IEEE.

Shadmehr, R., Brashers-Krug, T., and Mussa-Ivaldi, F. (1995). Interference in learning internal models of inverse dynamics in humans. In G. Tesauro, D. Touretzky, and T. Leen, editors, *Advances in Neural Information Processing Systems* 7, pp. 1117–24, Cambridge, MA. Proceedings of NIPS94 - Neural Information Processing Systems: Natural and Synthetic, MIT Press.

- Shaffer, L. H. (1991). Cognition and motor programming. In *Tutorials in motor neuroscience*, pp. 371–383. Dordrecht, Kluwer Academic Publishers.
- Shaffer, L. H. (1993). Motor programs and musical performance. In A. Badley and L. Wisekranz, editors, Attention: Selection, awareness, and control: A tribute to Donald Broadbent, chap. 7, pp. 135–151. Oxford: Clarindon Press.
- Shaffer, R. H. and Todd, N. (1987). The interpritive component in musical performance. In A. Gabrielson, editor, *Action and Perception in Rhythm and Music*, no. 55, pp. 139–152.
- Siegal, S. (1988). Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 2nd edn.
- Smith, J. O. (1998). Principles of digital waveguide models of musical instruments. In M. Kahrs and K. Brandenburg, editors, Applications of Digital Signal Processing to Audio and Acoustics, pp. 417–466. Boston/Dordrecht/London: Kluwer Academic Publishers. ISBN 0-7923-8130-0. see http://www.wkap.nl/book.htm/0-7923-8130-0.
- Tseng, C., Lee, Y., Chan, Y., Wu, S., and Chiu, A. (1998). A pc-based surgical simulator for laparoscopic surgery. In J. Westwood, H. Hoffman, D. Stredney, and S. Weghorst, editors, *Proceedings of Medicine Meets Virtual Reality 6.*, pp. 155–160, Amsterdam, Netherlands. IOS Press.
- Verrillo, R. (1992). Vibration sensation in humans. Music Perception, 9(3):281–302.
- von Holst, C. (1989). Relations between the central nervous system and the peripheral organs. *British Journal of Animal Behavior*, 2:89–94.

White, B. W. (1970). Perceptual findings with the vision-substitution system. In *Transactions On Man-Machine Systems*, vol. MMS-11, pp. 54–58. IEEE.