References

Armstrong, B., "Friction: Experimental Determination, Modeling and Compensation", *IEEE International Conference on Robotics and Automation*, Philadelphia, vol. 3, pp.1422-1427, 1988.

Armstrong-Helouvry, B., "Stick Slip and Control in Low-Speed Motion," *IEEE Transactions on Automatic Control* vol. 38, no 10, 1993.

Armstrong-Helouvry, B., and Amin, B., "PID Control in the Presence of Static Friction: Exact and Describing Function Analysis," *Proceedings of the American Control Conference*, pp 597-601, June, 1994.

Armstrong-Helouvry, B., and Amin, B., "PID Control in the Presence of Static Friction: A Comparison of Algebraic and Describing Function Analysis (Revised)," *Automatica*, vol. 32, no 5, pp. 679-692, 1996.

Armstrong-Helouvry, B., Dupont, P., and Canudas De Wit, C., "A Survey of Models, Analysis Tools and Compensation Methods for the Control of Machines with Friction," *Automatica*, vol. 30., no. 7, pp. 1083-1138, 1994.

Bridgman, P.W., Dimensional Analysis, Yale University Press, New Haven, Ct., 1931.

*Buckingham, E., "On Physically Similar Systems: Illustrations of the Use of Dimensional Equations," *Physics Review*, vol. 4 no. 4, pp. 345-376, 1914.

Canudas, C., Astrom, K.J. and Braun, K., "Adaptive Friction Compensation in DC Motor Drives," *Proc. of the 1986 International Conference on Robotics and Automation*, San Francisco: IEEE, pp. 1556-1561, 1986.

Craig, J.J., *Introduction to Robotics: Mechanics and Control*, Addison-Wesley Publishing Company, Reading, Ma, 1989.

*Dahl, P.R., "Measurement of Solid Friction Parameters of Ball Bearings", *Proc. of 6th Annual Sympo. on Incremental Motion Control Systems and Devices*, University of Illinois, 1977.

de Wit, C.C., Noel, P, Aubin, and A., Brogliato, "Adaptive Friction Compensation in Robot Manipulators: Low Velocities," *The International Journal of Robotics Research*, vol. 10. no. 3, pp. 189-199, 1991.

de Wit, C.C., Olsson, H., Astrom, K.J., and Lischinky, P., "A New Model for Control of Systems with Friction," A New Model for Control of Systems with Friction", *IEEE Transactions on Automatic Controls*, vol. 40, pp. 419-425, 1995.

de Wit, C.C. and Lischinky, P., "Adaptive Friction Compensation with Partially Known Dynamic Friction Model", *International Journal of Adaptive Control and Signal Processing*, vol. 11, pp. 65-80, 1997.

Electro-Craft Corp, *DC Motors, Speed Controls, Servo Systems: an Engineering Handbook,* Hopkins, Minn, 1980.

Friedland, B. and Park, Y-J, "On Adaptive Friction Compensation," *IEEE Transactions on Automatic Control*, vol. 37, no. 10, 1992.

Fu, K.S., Gonzalez, R.C. and Lee, C.S.G, *Robotics: Control, Sensing, Vision, and Intelligence,* McGraw-Hill, New York, 1987.

*Gilbart, J.W. and Winston, G.C., "Adaptive Compensation fro an Optical Tracking Telescope", *Automatica*, vol. 10, pp. 125-131, 1974.

Gieras, J. F. and Wing, M., *Permanent magnet Motor Technology: Design and Applications*, Marcel Dekker, New York, 1997.

Gottlieb, I.M., *Electric Motors and Control Techniques*, McGraw-Hill, New York, 1994.

Hamdi, E.S., Design of Small Electrical Machines, John Wiley & Sons, Chichester, 1994.

Hersey, M.D., Theory and Research in Lubrication, John Wiley & Sons, New York, 1966.

Hoenig S.A, and Payne F.L., *How to Build and Use Electronic Devices*, Little, Brown and Co., Boston, 1973.

Ipsen, D.C., Units, Dimensions, and Dimensionless Numbers, McGraw-Hill, New York, 1960.

Mabie, H.H. and Reinholtz, C.F., *Mechanisms and Dynamics of Machinery*, John Wiley & Sons, New York, 1987.

Nasar, S.A., Boldea, I., Unnewehr, L.E., *Permanent Magnet, Reluctance, and Self-Synchronous Motors*, CRC Press, Boca Raton, Fla, 1993.

Ogata, K., Modern Control Engineering, Prentice-Hall, Englewood Cliffs, NJ, 1970.

Rao, S.S., Mechanical Vibrations, Addison-Wesley, Reading, Mass, 1990.

Saner, F.E., Pittman, Servo Motor Application Notes, Pittman, Harleysville, Pa, 1993.

Saunders, W.R., Cole, D.G., and Fanin C.A., "Similitude Analyses for Piezostructures," *Journal of Intelligent Material Systems and Structures*, vol. 7, March, pp. 162-166, 1996.

Schepartz, B., *Dimensional Analysis in the Biomedical Sciences*, Charles C Thomas Publisher, Springfield, IL, 1980.

Servo Systems, 1996-1997 Servo Systems Catalog, Montville, NJ, 1996.

Staicu, C.I., *Restricted and General Dimensional Analysis*, Abacus House, Tunbridge Wells, Kent, England, 1982.

Stoten, D.P., *Model Reference Adaptive Control of Manipulators*, John Wiley & Sons, New York, 1992.

Thomson, W.T., Laplace Transformation, Prentice-Hall, Englewood Cliffs, NJ, 1960.

*Tustin, A. "The Effects of Backlash and of Speed-Dependent Friction on the Stability of Closed-Cycle Control Systems", *Journal of the Institution of Electrical Engineers*, vol. 94, no. 2A, pp. 143-151, 1947.

Walker, P., *Direct Current Motors: Characteristics and Applications*, Tab Books, Blue Ridge Summit, Pa, 1978.

Walrath, C.D., "Adaptive Bearing Friction Compensation Based on Recent Knowledge of Dynamic Friction", *Automatica*, vol. 20, no. 6, pp. 717-727, 1984.

White, F.M., Fluid Mechanics, McGraw-Hill, New York, 1986.

Wylie, C.R., Advanced Engineering Mathematics, McGraw Hill, New York, 1951.

Yang, S. and Tomizuka M., "Adaptive Pulse width Control for Precise Positioning Under the Influence of Stiction and Coulomb Friction," *Journal of Dynamic Systems, Measurement, and Control*, vol. 110, pp. 221-227, 1988.

* Indicates sources cited in the literature that the author was unable to access through Va. Tech's library.