Biosketch
Dr. ROBERT H. KING
February 2011

Professional Experience Summary:

1993 - Present	Professor of Engineering, CSM.
2000 - 01	Acting Director of the Engineering Division
1995 - 2003	Assistant Director of the Engineering Division
1992	Visiting Scientist, DOE, INEEL (Summer)
1991	Visiting Researcher, Mount Isa Mines, Queensland Australia (Sabbatical Leave)
1985 - 96	Engineer, Bureau of Mines and Department of Energy (Part time)
1981 - 93	Associate Professor and Professor in Mining Engineering at CSM.
1978 - 81	Assistant Professor, the Pennsylvania State University, University Park campus.
1972 - 74	Graduate Assistant, Research Assistant, and Instructor Penn State.
1969 - 72	Engineer, US Steel.

Present Semester Teaching Assignment:

EGGN 413 Computer Aided Engineering (Applied Finite Element Analysis)

Teaching Experience:

Computer Aided Engineering (Applied Finite Element Analysis), Introduction to Robotics, Electrical Circuits, Electronics, and Power, Senior Engineering Capstone Design I, and II, Computer Data Acquisition with LabVIEW (Field Session), Multidisciplinary Engineering Laboratory (MEL) I. II, and III, Outreach Courses for Industry in LabVIEW Fundamentals, LabVIEW Development, and Computer Data Acquisition and Signal Conditioning in the National Instruments Training Center at CSM. Introduction to Mining Engineering, Underground Coal Mine Design, Underground Metal/nonmetal Mine Design, Conveyor Belt Design, Rail Haulage Design, Mine Electrical System Design (Graduate Course), Mining Automation and Robotics (Graduate Course), Mine Surveying (Field Session), Mine Pumping and Drainage, Mine Hoisting, Introduction to Programming with FORTRAN (EPICS 201), Introduction to Engineering Projects (EPICS 101 and 102), Programming with Spreadsheets, Engineering Design with AutoCAD,

Selected Publications and Presentations in Automated Measurement and Health Monitoring:

1. K. Koenig, A.N. Lasseigne, J.W. Cisler, B. Mishra, and D.L. Olson, “Non-Contact Non-Destructive Hydrogen and Microstructural Assessment of Steel Welds,” International Journal of Pressure Vessels and Piping, 87 (2010), pp. 605-610.
2. King, R. H. Introduction to Data Acquisition with LabVIEW, McGraw Hill, ISBN 978-0-07-338584-6, 2008, 236 p.
3. Zhang, R. King, L. Olson, and You-lin Xu, 2005, Dynamic response of the Trinity River Relief Bridge to controlled pile damage: modeling and experimental data analysis comparing Fourier and Hilbert-Huang techniques, *Journal of Sound and Vibration*, 285, 1049 -1070.
4. King, R. H., 2004, Microclimate Effects from Closing Abandoned Mines with Culvert Bat Gates, US Bureau of Land Management, Technical Note 416.
5. F. W. Hood, W. A. Hoff, and R. H. King, "Evaluation of An Interactive System for Creating Object Models from Range Data," Proc. of ANS 7th Topical Meeting on Robotics and Remote Systems, Augusta, GA, April 27-May 1, 1997.
6. Lane, J. D. and King, R. H., 1994, “Automatic Steering of an Articulated Haul Truck for Underground Mining,” USBM Information Circular IC9407, 41 p.
7. Strickland, W. H. and King, R. H., 1993, "Characteristics of Ultrasonic Ranging Sensors in an Underground Environment," USBM Report of Investigations RI9452, 39 p.
8. Gordon, A., H. Chang, and R. H. King, 1993, “Neural Networks for Processing Data from Multiple Redundant Sensors for Mine Systems Management, Operation, Maintenance and Control,” Proceedings of SPIE Sensor Fusion VI Conference, Boston, Sept. 7-10, p. 512-521.

9. Lever, P. J. A., A. Gordon, and R. H. King, 1991, "AI Techniques for Adapting to the Dynamic Mining Environment," Proceedings of the Second Canadian Conference on Computer Applications in the Mineral Industry, p 231-242.
10. Lever, P.J.A., R.H. King, and R.E. Cameron, 1991, "Adapting the Intelligent Decision Support System to Variable Mining Conditions," SME Transactions, vol. 288, pp 1859-1864.
11. Lever, P. J. A., A. Gordon, and R. H. King, 1991, "Fusing Data from Continuous Miner, Shuttle Car, and Roof Bolter Power Sensors," Proceedings, Eighth Annual Workshop, Generic Mineral Technology Center for Mine Systems Design and Ground Control, p 139-144.
12. Gordon, A. and King, R. H., 1991, "Intelligent Waveform Analysis for Ultrasonic Ranging in a Cluttered Environment," Proceedings of the 1991 IEEE/IAS Conference, Dearborn, MI. Lever, P. J. A., R. H. King, and A. Gordon, 1991, "Improved Machine Event Classification Accuracy Using Context Limited Sensor Fusion," Proceedings, International Symposium on Mine Mechanization and Automation, CSM, Golden, CO.
13. King, R. H., P. J. A. Lever, W. Strickland, and J. D. Lane, 1991, "Ultrasonic Rangers for Underground Mine Equipment Navigation," Proceedings, International Symposium on Mine Mechanization and Automation, CSM, Golden, CO.
14. Schricker, D.R., P. J. A. Lever, R. H. King, and R. E. Cameron, 1990, "Intelligent Decision support System for Mine Managers," Technical Note, Mining Engineering, vol. 42, no. 9, pp 1096 1098.
15. Strickland, W.H. and King, R.H., 1990, "Characteristics of Ultrasonic Ranging Sensors in an Underground Mine Environment," Preprint 90 134, SME Annual Meeting, Salt Lake City, Utah.
16. Gordon, A., R.H. King, and W. Wagner, 1989, "Intelligent Waveform Analysis for Ultrasonic Ranging in a Cluttered Environment," Proceedings of the Second Colorado Institute for Artificial Intelligence research Symposium.
17. King, R.H., A. Gordon, and K. Rossmiller, 1989, "Remote Detection of Mining Machine Performance Using Conceptual Clustering," Proceedings of the First Colorado Institute for Artificial Intelligence Research Symposium.
18. King, R.H., D. R. Schricker, P.J.A. Lever, and R. E. Cameron, 1989, "AI Techniques to Improve Management Information from Monitoring Systems," Preprint for the Annual SME/AIME Meeting, Las Vegas, NV.
19. Lever, P.J.A., R.H. King, D. R. Schricker, and R. E. Cameron, 1989, "Knowledge Representation Concepts for an Intelligent Decision Support System," 21st Application of Computers and Operations Research in the Mineral Industry, A. Weiss, editor.
20. King, R.H. and L. Eros, 1988, "Microcomputer Based Mine Monitoring System Proves Successful at Deserado Coal Mine, “Mining Engineering, vol. 40, no. 2. King, R.H. and L. Eros, 1986, "Deserado Mine Computer Monitoring and Control Systems Evaluation," Preprint 87 13, Annual Meeting of SME/AIME.
21. Mitchell, J., L. Eros, and R.H. King, 1986, "Deserado Mine Computer Monitoring and Control System," Proceedings of the Eighth WVU Mining Electro Technology Conference.
22. Briggs, M.R., R.H. King, and J.C. Franklin, 1985, "In Mine Evaluation of Continuous Radon and Working Level Detectors," Occupational Radiation Safety in Mining, vol. 1, Canadian Nuclear Association, Toronto, p 212 218. Lever, P.J.A.,
23. F. R. Leffler, and R.H. King, 1985, "Hoist Performance Electrical Parameters," Conference Record, 1985 IEEE/IAS Annual Meeting.
24. Calizaya F., R.H. King, and J.C. Franklin, 1985, "A Controlled Study of the Evolution of Radon Gas and Decay Products in Radioactive Mine Environments," Proceedings of the Second U.S. Mine Ventilation Symposium, Reno, NV.
25. Engleman, S.D., H.J. Beaulieu, and R.H. King, 1984, "Field Validation Study of the MDA Instant Working Level Meter in a High Gamma Background Mine Environment," paper presented at the American Industrial Hygiene Conference, Philadelphia, PA, May 1983, and published in the Journal of Industrial Hygiene.

Selected Publications and Presentations in Regolith Handling:

1. King RH, Van Susante P, and Gefreh M, “Analytical models and laboratory measurements of the soil–tool interaction force to push a narrow tool through JSC-1A lunar simulant and Ottawa sand at different cutting depths,” Journal of Terramechanics 48 (2011), pp. 85-95.

2. R. H. King, P. van Susante, and M. A. Gefreh, Comparing Blade/Soil Interaction Models in a Matlab Program to Measurements of Forces to Push Narrow Rods Through Sand and Simulant Materials for Design of Extraterrestrial Soil Handling Machines, Space Resources Rountable XI, CSM June 10, 2010.
3. A. T. Brewer and R. H. King, Laboratory-Scale Distributed Stress Measurements of Blade Interaction with JSC-1A Lunar Simulant, Space Resources Rountable XI, CSM June 10, 2010.
4. R. H. King, P. van Susante, and R. P. Mueller, Comparison of Lance Blade Data and Analytical Force Models, Space Resources Rountable XI, CSM June 10, 2010.
5. P. J. van Susante and R. H. King, Finite Element Method to Calculate Forces and Stresses on Blades Excavating Lunar Simulants, Space Resources Rountable XI, CSM June 10, 2010.
6. Johnson, Lee L. and R. H. King, 2010, "Measurement of Force to Excavate Extraterrestrial Regolith with a Small Bucket-wheel Device " Journal of Terramechanics, v47(2), 87-95.
7. Mueller, R. P. and R. H. King, "Trade Study of Excavation Tools and Equipment for Lunar Outpost Development and ISRU," AIP Conf. Proc. 969, 237-244, 2008.
8. R.P. Mueller and R.H.King, Criteria for Lunar Outpost Excavation, Space Resources Rountable IX, CSM Oct. 26, 2007.
9. R. H. King, L. L. Johnson, M. B. Duke, Laboratory Measurement of Soil Excavation Forces and Relation to Lunar Soil Geotechnical Properties, Space Resources Rountable IX, CSM Oct. 26, 2007.
10. R. H. King and P. van Susante, Geotechnical Properties of the JSC1-A Lunar Simulant, Paper 5-6, Planetary and Terrestrial Mining Smposium, June 10-13, Sudbury, Ont. Published in the on-line conference proceedings at: http://www.ptmss.com/members/papers/papers2007.aspx
11. King, R. H. M. B. Duke, and L. Johnson, "Evaluation of Lunar-regolith Excavator Concepts for a Small ISRU Oxygen Plant," Space Resources Roundtable VII: LEAG Conference on Lunar Exploration, Oct 25-28, 2005, League City, TX
12. Damer, B., Rasmussen, D. Newman, P., Blair, B., Duke, M., King, R., Muff, T., Shirley, M. and Shen, W-M."Design Simulation of Lunar Exploration and ISRU Prototype Vehicles and Mission Scenarios," Space Resources Roundtable VII: LEAG Conference on Lunar Exploration, Oct 25-28, 2005, League City, TX
13. Muff, T., L. Johnson, R. King and M.B. Duke, 2004, A Prototype Bucket Wheel Excavator for the Moon, Mars and Phobos**,** AIP Conference Proceedings, February 4, 2004, Volume 699, Issue 1, pp. 967-974.
14. Nock, K, Duke, M., King R. et al, 2002, "An Interplanetary Rapid Transit system Between Earth and Mars, AIP Conference Proceedings, January 28, 2003, Volume 654, Issue 1, pp. 1075-1086.
15. Muff, T, R. King, and M. Duke, 2001, "Analysis of a Small Robot for Martian Regolith Excavation," Proceedings of the AIAA Space 2001 Conference and Exposition, Albuquerque.
16. Muff, T., King, R. H., and Duke, M. B., 2000, "Preliminary Analysis of a Small Robot for Martian Regolith Excavation," Proceedings of the Space Resources Roundtable Conference, Golden.
17. Gothard B. and R H. King, 1990, "An Extraterrestrial Excavator Robot", in Proceedings of FY90 Workshop on Extraterrestrial Mining and Construction, PP IV-21-43, August 7 - 9, Golden, NTIS.

Selected Publications and Presentations in Engineering Education:

1. King, R. H. "Enhancing Thinking Maturity with the Multidisciplinary Engineering Laboratory Course Sequence," Invited Presentation at University of Queensland, Australia, March 25, 2003.
2. King, R. H. "Teaching Design at the Colorado School of Mines," Teaching and Learning Seminar at the University of Sydney, Australia, March 21, 2003.
3. King and Gosink, "Meeting ABET EC 2000 Criterion 3 Outcomes with a Laboratory Course." Proceedings of the 2001 ASEE Annual Meeting, Albuquerque.
4. King, Parker, Gosink, Grover, 2001, " A Sequence of Multidisciplinary Engineering Laboratory Courses, " Proceedings of the 2001 ASEE Annual Meeting, Albuquerque.
5. Streveler, R. A. and R. H. King, 2000, "Facilitating Open-ended Problem Solving: Training Engineering TAs to Facilitate Open-ended Problem Solving," Journal of Graduate Teaching Assist Development, v7, n3, p. 139-146.
6. King, R. H., T. E. Parker, T. P. Grover, J. P. Gosink, N. T. Middleton, 1999, "A Multidisciplinary Engineering Laboratory Course, Journal of Engineering Education, July, v 88, n 3, p 311- 316.
7. King, R. H., 1999, "Using Educational Goals to Select Appropriate Technology for Laboratory Courses," Teaching With Technology 99 Conference, University of Colorado System, July 14-17, CSM Campus.

8. Gosink, J., N. Middleton and R. King, "An Interdisciplinary Engineering Laboratory at the Colorado School of Mines", Proceedings of the 1997 ASME Mechanical Engineering Department Heads Education Conference, March 1997.
9. King, R. H., Parker, T., Grover, T., Gosink, J., Middleton, N., 1997, “Multidisciplinary Engineering Laboratory Experiments,” paper F2F.4, FIE97, Frontiers in Education Conference Proceedings, Pittsburgh PA Nov 5-8.

Information on additional publications and reports from completed research projects and graduate student supervision available on request.