

Raymond H. Byrne, Ph.D.

email: rhbyrne@sandia.gov

Education

- June 2009 | **M.S. in Financial Mathematics, University of Chicago**, GPA = 3.81
May 1995 | **Ph.D. in Electrical Engineering, University of New Mexico**, GPA = 3.96
Dissertation - Robust Lateral Control of Highway Vehicles
May 1989 | **M.S. in Electrical Engineering, University of Colorado**, GPA = 3.98
Concentration - Control Theory and Electronics
May 1987 | **M.S. in Electrical Engineering, University of Virginia**, GPA = 3.78
Concentration - Control Theory and Electronics

Experience

- May 1989 | **Sandia National Laboratories**, Albuquerque, NM
- present | *Manager, Electric Power System Research Department 8813*
 - developed an optimization framework for estimating the maximum potential revenue from energy storage in market areas. Analyzed CAISO, ERCOT, PJM, and ISO-NE.
 - led several studies to evaluate the impact of increased renewable generation on the small signal stability of the Western Electricity Coordinating Council (WECC).
 - developed a rad-hard high speed fiber optic link for space applications. At the time, these links were the fastest ever deployed in space.
 - developed several miniature robotic vehicles to demonstrate cooperative behaviors. These robots were inducted into the Smithsonian American History museum in 2011 to to “reflect the historical record of robotic development” in the United States. The miniature robots were recognized as “2001 Time Magazine Invention of the Year” in robotics (with Doug Adkins and Ed Heller).
 - elevated to Distinguished Member of the Technical Staff in 2007.
- January 1996 | **University of New Mexico**, Albuquerque, NM
- 2001 | *Adjunct Professor*
 - EECE 495 - Introduction to Mobile Robots (Spring 1996,1997)
 - EECE 595 - Introduction to Embedded Systems (Fall 2000)
 - CS 251 - C++ Programming (Spring 2001)
- August 1987 | **University of Colorado**, Boulder, CO.
- May 1988 | *Teaching Assistant* - taught three electronics labs each semester
May 1986 | **Texas Instruments**, Dallas, TX.
- August 1986 | *Summer Internship* - investigated production problems in the guidance section of the HARM missile.

Professional Societies

- President, University of Virginia Eta Kappa Nu (1986 – 87)
Chairman, Vice-Chairman, Treasurer, and Secretary; Albuquerque IEEE Section (1992- Present)
President, UNM Sigma Xi Chapter (2012 - present)
Member of Tau Beta Pi
IEEE ABET Program Evaluator (2017-present)

Activities

Golf, skiing, mountain biking, roller-blading

Awards

Recipient of IEEE Millenium Medal (May 2000), U.S. Mid-Amateur Qualifier (1996, 1997, and 1999), Who’s Who in Science and Engineering and Who’s Who in America, Time Magazine 2001 Invention of the Year in Robotics, Sun Country Match Play Champion (2002), several robots were inducted into the Smithsonian American History Museum in 2011, elevated to IEEE Fellow January 1, 2017 for contributions to miniature robotics and grid integration of energy storage

Journal Publications

- J. F. Ellison, L. Rashkin, J. Serio, R. H. Byrne, “The benefits of grid-scale storage on Oahu,” *Journal of Energy Storage*, vol. 15, pp.336-344, 2018.
- R. H. Byrne, T. A. Nugyen, D. A. Copp, B. R. Chalamala, I. Gyuk, “Energy Management and Optimization Methods for Grid Energy Storage Systems,” *IEEE Access*, vol. 6, pp. 13231-13260, 2018.
- J. C. Neely, J. Johnson, R. H. Byrne, and R. T. Elliott, “Structured optimization for parameter selection of frequency-watt grid support functions for wide area damping,” *International Journal of Distributed Energy Resources and Smart Grids*, vol. 11, no. 1, pp. 69–94, 2015.
- A. Clauset, H. G. Tanner, C. T. Abdallah, and R. H. Byrne, “Controlling across complex networks; emerging links between networks and control,” *Annual Reviews in Control*, vol. 32, pp. 183–192, 2008.
- R. H. Byrne, D. R. Adkins, S. E. Eskridge, J. J. Harrington, E. J. Heller, and J. E. Hurtado, “Miniature mobile robots for plume tracking and source localization research,” *Journal of Micromechatronics*, vol. 1, no. 3, pp. 253–262, 2002.
- R. H. Byrne and C. T. Abdallah, “Design of a model reference adaptive controller for vehicle road following,” *Mathematical Computer Modelling*, vol. 22, no. 4-7, pp. 343–354, 1995.
- R. H. Byrne and P. R. Klarer, “Sandia National Laboratories military robotic technologies,” *Unmanned Systems*, vol. 10, no. 2, pp. 42–47, 1992.

Magazine Articles

- R. H. Byrne, C. T. Abdallah, and P. Dorato, “Experimental results in robust lateral control of highway vehicles,” *IEEE Control Systems Magazine*, vol. 18, no. 2, pp. 70–76, April 1998.
- R. H. Byrne, “A practical implementation of a hierarchical control system for telerobotic land vehicles,” *IEEE Aerospace and Electronics Systems Magazine*, vol. 7, no. 10, October 1992.

Book Chapters

- J. T. Feddema, D. A. Schoenwald, R. D. Robinett, and R. H. Byrne, *Encyclopedia of Complexity and Systems Science*. Springer Verlag, 2009, ch. Distributed Controls of Multiple Robotic Systems, An Optimization Approach.

Workshops

- R. H. Byrne, “Energy Storage 101 – The Basics,” “Southwest public utility commission (PUC) energy storage workshop, Albuquerque, NM, May 2016.
- J. T. Feddema, R. D. Robinett, and R. H. Byrne, “An optimization approach to distributed controls of multiple robotic vehicles,” Workshop on Control and Cooperation of Intelligent Miniature Robots, 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2003), October 2003.
- J. E. Hurtado, R. H. Byrne, S. E. Eskridge, and J. J. Harrington, “Miniature mobile robots for plume tracking and source localization research,” Workshop on Mobile Micro-Robots, 2000 IEEE International Conference on Robotics and Automation, April 2000.

Invited Presentations

- R. H. Byrne, "Energy Storage 101," the Energy Council's 2017 Global Energy and Environmental Issues Conference, Banff, Alberta, Canada, December 2017.
- R. H. Byrne, "Grid stability with high renewable penetration," South Dakota State University Fall Banquet, Brookings, SD, October 2016.
- R. H. Byrne, "An overview of embedded systems applications in robotics," Invited presentation at the Chilean Electronics Industry Association International Seminar on Microelectronics and Embedded Systems, Santiago, Chile, June 2002.

Conference Presentations

- R. H. Byrne, T. A. Nguyen, "Opportunities for energy storage in CAISO," Electrical Energy Storage Applications and Technologies (EESAT) Conference 2017, San Diego, CA, October 2017.
- R. H. Byrne, "Estimating revenue from energy storage in market areas," Stationary Energy Storage Conference, San Francisco, CA, February 2017.
- R. H. Byrne, "Energy storage overview," 2015 New Mexico Society of Professional Engineers Annual Meeting, Albuquerque, NM, November 2015.
- R. H. Byrne, "Valuation of energy storage: Arbitrage and the regulation market," Electricity Storage Association 22nd Annual Meeting, Washington, D.C., May 2012.
- R. H. Byrne, J. C. Neely, C. A. Silva-Monroy, D. A. Schoenwald, D. J. Trudnowski, and M. K. Donnelly, "Evaluation of energy storage technologies for damping control," Modeling, Simulation, And Optimization for the 21st Century Electric Power Grid, Lake Geneva, WI, October 2012.

Conference Papers

- R. H. Byrne, T. A. Nguyen and R. J. Concepcion, "Opportunities for energy storage in CAISO," submitted to the 2018 IEEE Power and Energy Society (PES) General Meeting, August 5-9, 2018.
- R. H. Byrne, T. A. Nguyen, D. A. Copp, R. J. Concepcion, B. R. Chalamala and I. Gyuk, "Opportunities for energy storage in CAISO: day-ahead and real-time market arbitrage," submitted to the 2018 IEEE SPEEDAM Conference, June 20-22, 2018.
- T. A. Nguyen, R. H. Byrne, B. R. Chalamala and I. Gyuk, "Maximizing the revenue of energy storage in market areas considering nonlinear storage efficiencies," submitted to the 2018 IEEE SPEEDAM Conference, June 20-22, 2018.
- C. Lackner, T. A. Nguyen, R. H. Byrne and F. Wiegandt, "Energy storage participation in the German secondary regulation market," accepted for publication in the 2018 IEEE Transmission and Distribution Conference and Exposition, Denver, CO, April 2018.
- A. Finelli, Z. Sutton, Q. Lu, P. Willett, Y. Bar-Shalom, K. LeGrand and R. Byrne, "Performance of an emerging Delta-GLMB Filter," accepted for publication at the 2018 IEEE Aerospace Conference, Big Sky, Montana, March 3-10, 2018.

Conference Papers (continued)

- T. A. Nguyen, R. H. Byrne, “Maximizing the cost-savings for time-of-use and net-metering customers using behind-the-meter energy storage systems,” in *Proceedings of the 2017 IEEE North American Power Symposium (NAPS)*, Morgan Town, WV, Sept 2017, pp. 1-5.
- R. H. Byrne, S. Hamilton, D. R. Borneo, T. Olinsky-Paul, and I. Gyuk, “The value proposition for energy storage at the Sterling Municipal Light Department,” in *Proceedings of the 2017 IEEE Power and Energy Society (PES) General Meeting*, Chicago, IL, July 2017, pp. 1-5.
- D. J. Trudnowski, B. J. Pierre, F. Wilches-Bernal, D. A. Schoenwald, R. T. Elliott, J. C. Neely, R. H. Byrne, and D. N. Kosterev, “Initial closed-loop testing results for the Pacific DC Intertie wide area damping controller,” in *Proceedings of the 2017 IEEE Power and Energy Society (PES) General Meeting*, Chicago, IL, July 2017, pp. 1-5.
- T. A. Nguyen, R. H. Byrne, R. J. Concepcion, and I. Gyuk, “Maximizing revenue from electrical energy storage in MISO energy and frequency regulation markets,” in *Proceedings of the 2017 IEEE Power Energy Society (PES) General Meeting*, Chicago, IL, July 2017, pp.1-5.
- B. J. Pierre, F. Wilches-Bernal, R. T. Elliott, D. A. Schoenwald, J. C. Neely, R. H. Byrne, and D. J. Trudnowski, “Simulation results for the Pacific DC Intertie wide area damping controller,” in *Proceedings of the 2017 IEEE Power and Energy Society (PES) General Meeting*, Chicago, IL, July 2017, pp. 1-5.
- F. Wilches-Bernal, R. Concepcion, J. C. Neely, D. A. Schoenwald, R. H. Byrne, B. J. Pierre, and R. T. Elliott, “Effect of time delay asymmetries in power system damping control,” in *proceedings of the 2017 IEEE Power and Energy Society (PES) General Meeting*, Chicago, IL, July 2017, pp. 1-5.
- F. Wilches-Bernal, B. J. Pierre, R. T. Elliott, D. A. Schoenwald, R. H. Byrne, J. C. Neely, and D. J. Trudnowski, “Time delay definitions and characterization in the Pacific DC Intertie wide area damping controller,” in *Proceedings of the 2017 IEEE Power and Energy Society (PES) General Meeting*, Chicago, IL, July 2017, pp. 1-5. (Best paper session)
- B. J. Pierre, F. Wilches-Bernal, D. A. Schoenwald, R. T. Elliott, J. C. Neely, R. H. Byrne, and D. J. Trudnowski, “Open-loop testing results for the pacific DC intertie wide area damping controller,” in *2017 IEEE Manchester PowerTech*, Manchester, 2017, pp. 1-6.
- R. Byrne, R. Elliott, F. Wilches-Bernal, R. Concepcion, J. Neely, O. Lavrova, and J. Quiroz, “Small signal stability of the western North American power grid with high penetrations of renewable generation,” in *Proceedings of the 43rd IEEE Photovoltaic Specialists Conference*, Portland, OR, June 2016.
- B. Pierre, R. Elliott, D. Schoenwald, J. Neely, R. Byrne, D. Trudnowski, and J. Colwell, “Supervisory system for a wide area damping controller using PDCI modulation and real-time PMU feedback,” in *Proceedings of the 2016 IEEE Power and Energy Society (PES) General Meeting*, Boston, MA, July 2016. (Best paper session).
- R. H. Byrne, R. Concepcion, and C. A. Silva-Monroy, “Estimating potential revenue from electrical energy storage in PJM,” in *Proceedings of the 2016 IEEE Power and Energy Society (PES) General Meeting*, Boston, MA, July 2016. (Prize paper award)
- R. H. Byrne and C. A. Silva-Monroy, “Potential revenue from electrical energy storage in ERCOT: The impact of location and recent trends,” in *Proceedings of the 2015 IEEE Power and Energy Society (PES) General Meeting*, Denver, CO, July 2015, pp. 1–5.

Conference Papers (continued)

- J. A. Love, R. L. Hansen, D. K. Melgaard, D. B. Karelitz, T. A. Pitts, and R. H. Byrne, "Evaluation of urban vehicle tracking algorithms," in *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2015, pp. 1–20.
- R. T. Elliott, R. H. Byrne, A. Ellis, and L. Grant, "Impact of increased photovoltaic generation on inter-area oscillations in the western North American power system," in *Proceedings of the 2014 IEEE Power and Energy Society (PES) General Meeting*, Washington, DC, July 2014, pp. 1–5.
- R. H. Byrne, D. J. Trudnowski, J. C. Neely, R. T. Elliott, D. A. Schoenwald, and M. K. Donnelly, "Optimal locations for energy storage damping systems in the western North American interconnect," in *Proceedings of the 2014 IEEE Power and Energy Society (PES) General Meeting*, Washington, DC, July 2014.
- R. H. Byrne and C. A. Silva-Monroy, "Maximizing revenue from electrical energy storage in the Electricity Reliability Council of Texas (ERCOT)," in *Proceedings of the 2014 IEEE Power and Energy Society (PES) General Meeting*, Washington, DC, July 2014.
- C. A. Silva-Monroy, J. C. Neely, R. H. Byrne, R. T. Elliott, and D. A. Schoenwald, "Wind generation controls for damping of inter-area oscillations," in *Proceedings of the 2013 IEEE Power and Energy Society (PES) General Meeting*, Vancouver, BC, July 2013, pp. 1–5.
- J. C. Neely, R. H. Byrne, R. T. Elliott, C. A. Silva-Monroy, D. A. Schoenwald, D. J. Trudnowski, and M. K. Donnelly, "Damping of inter-area oscillations using energy storage," in *Proceedings of the 2013 IEEE Power and Energy Society (PES) General Meeting*, Vancouver, BC, July 2013, pp. 1–5.
- R. Byrne, M. Griesmeyer, R. Schmidt, J. Shaddix, and D. Bodette, "Benefits of a geosynchronous orbit (GEO) observation point for orbit determination," in *Proceedings of the 2011 Advanced Maui Optical and Space Surveillance Technologies Conference*, Maui, HI, September 2011.
- A. Clauset, B. Tanner, R. Byrne, and C. T. Abdallah, "Controlling across complex networks," in *Proceedings of the IFAC Time-delay Symposium*, Nantes, France, September 2007.
- A. Regmi, R. Sandoval, R. Byrne, H. Tanner, and C. T. Abdallah, "Experimental implementation of flocking algorithms in wheeled mobile robots," in *Proceedings of the 2005 American Control Conference*, Portland, OR, June 2005, pp. 4917–4922.
- R. Sandoval-Rodriguez, C. T. Abdallah, H. Jerez, and R. H. Byrne, "Experimental results on the effects of 802.11b WLAN on networked control systems," in *Proceedings of the 13th Mediterranean Conference on Control and Automation*, June 2005, pp. 1113–1118.
- R. Sandoval-Rodriguez, C. T. Abdallah, and R. H. Byrne, "Effects of quantization, saturation, and sampling time in multi output systems," in *Proceedings of the 43rd IEEE Conference on Decision and Control*, vol. 4, The Bahamas, December 2004, pp. 4509–4514.
- R. Sandoval-Rodriguez, C. T. Abdallah, P. F. Hokayem, E. Schamiloglu, and R. H. Byrne, "Robust mobile robotic formation control using internet-like protocols," in *Proceedings of the 42nd IEEE Conference on Decision and Control*, vol. 5, Maui, Hawaii, December 2003, pp. 5109–5112.

Conference Papers (continued)

- R. Byrne, S. Eskridge, J. Harrington, and J. Hurtado, "Micro robots and applications," in *Proceedings of the Unmanned Vehicle System Technology Conference*, Brussels, Belgium, December 2001.
- C. T. Abdallah, M. Arioloa, and R. Byrne, "Statistical-learning of an ABR explicit rate algorithm for ATM switches," in *Proceedings of the 39th IEEE Conference on Decision and Control*, Sydney, Australia, December 2000.
- A. Hvezda, J. Garcia, P. Klarer, R. Byrne, G. Heileman, and C. Abdallah, "LOBOTomous: an autonomous platform for indoor environments," in *Proceedings of the 14th National Conference on Artificial Intelligence (AAAI-97)*, Providence, RI, July 1997.
- R. Byrne, B. Rainwater-Sturgis, and R. Robinett, "A moving mass trim control system for reentry vehicle guidance," in *Proceedings of the AIAA Atmospheric Flight Mechanics Conference*, San Diego, CA, July 1996.
- R. Byrne, B. Rainwater-Sturgis, and R. Robinett, "Moving mass trim control system design," in *Proceedings of the AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, July 1996.
- R. H. Byrne, C. T. Abdallah, and P. Dorato, "Experimental results in robust lateral control of highway vehicles," in *Proceedings of the 34th IEEE Conference on Decision and Control*, vol. 4, New Orleans, LA, December 1995, pp. 3572–3575.
- R. H. Byrne and C. T. Abdallah, "Robust lateral control of highway vehicles," in *Proceedings of the Intelligent Vehicles '94 Symposium*, Paris, France, October 1994, pp. 375–380.
- C. Abdallah, P. Dorato, J. Benitez-Read, and R. Byrne, "Delayed positive feedback can stabilize oscillatory systems," in *Proceedings of the American Control Conference*, San Francisco, CA, June 1993, pp. 3106–3107.
- R. H. Byrne, P. R. Klarer, and J. B. Pletta, "Military robotic technologies," in *Proceedings of the American Nuclear Society 5th Topical Meeting on Robotics and Remote Sensing*, Knoxville, TN, April 1993.
- R. H. Byrne and J. J. Harrington, "Cooperation of mobile robots for accident scene inspection," in *Robotics and Manufacturing, Recent Trends in Research, Education, and Applications*, Santa Fe, NM, November 1992, pp. 531–537.
- R. H. Byrne, "A practical implementation of a hierarchical control system for telerobotic land vehicles," in *Proceedings of the National Telesystems Conference*, Washington, D.C., May 1992, pp. 10.1–10.5.

Technical Reports

- R. H. Byrne, J. C. Neely, L. J. Rashkin, D. Roberson, D. J. Trudnowski, and D. Wilson, "Final technical report: Distributed controls for high penetrations of renewables," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2015-11072, December 2015.
- R. H. Byrne, D. R. Borneo, C. O. Christensen, D. R. Conover, I. Gyuk, J. Hernandez, G. Huff, M. Kinter-Meyer, J. Lin, D. Rosewater, D. A. Schoenwald, and V. Viswanathan, "Recommendations on energy storage for the energy information agency," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2015-11015, December 2015.
- D. Bender, R. Byrne, and D. Borneo, "ARRA energy storage demonstration projects: Lessons learned and recommendations," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2015-5242, June 2015.

Technical Reports (continued)

- R. L. Hansen, J. A. Love, D. B. Karelitz, J. D. Zollweg, D. Z. Anderson, D. A. Bender, D. K. Melgaard, T. A. Pitts, P. Nandy, G. L. Whitlow, and R. H. Byrne, "Large scale tracking algorithms," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2015-0209, January 2015.
- T. Jenkin, V. Diakov, E. Drury, B. Bush, P. Denholm, J. Milford, D. Arent, R. Margolis, and R. Byrne, "The use of solar and wind as a physical hedge against price variability within a generation portfolio," National Renewable Energy Laboratory, Golden, CO, Tech. Rep. NREL/TP-6A20-59065, August 2013.
- C. A. S. Monroy, V. W. Loose, J. F. Ellison, R. T. Elliott, R. Guttromson, L. S. Tesfatsion, and R. H. Byrne, "New wholesale power market design using linked forward markets : a study for the DOE energy storage systems program," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2013-2789, April 2013.
- R. H. Byrne, B. W. Bush, and T. Jenkin, "Long-term modeling of natural gas prices," Sandia National Laboratories, Tech. Rep. SAND2013-2898, April 2013.
- R. H. Byrne, R. T. Elliott, J. C. Neely, C. A. Silva-Monroy, D. A. Schoenwald, and L. L. Grant, "Renewable source controls for grid stability," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2012-10416, December 2012.
- R. H. Byrne and C. A. Silva-Monroy, "Estimating the maximum potential revenue for grid connected electricity storage: Arbitrage and the regulation market," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2012-3863, December 2012.
- R. H. Byrne, M. K. Donnelly, V. Loose, and D. J. Trudnowski, "Methodology to determine the technical performance and value proposition for grid-scale energy storage systems: A study for the doe energy storage systems program," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2012-10639, December 2012.
- J. F. Ellison, L. S. Tesfatsion, V. W. Loose, and R. H. Byrne, "Project report : a survey of operating reserve markets in U.S. ISO/RTO-managed electric energy regions," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2012-1000, September 2012.
- R. H. Byrne, J. T. Feddema, and C. T. Abdallah, "Algebraic connectivity and graph robustness," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2009-4494, July 2009.
- J. Lewis, C. D. Harrison, D. K. Melgaard, D. S. Myers, D. S. Lee, J. J. Carlson, and R. H. Byrne, "Application specific compression: Final report," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2008-6566, December 2008.
- K. N. Groom, R. H. Byrne, G. A. Laguna, B. R. Rohrer, D. G. Wilson, R. D. Robinett, J. J. Harrington, R. J. Bickerstaff, and J. B. Rigdon, "Design tools for complex dynamic security systems," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2007-0433, January 2007.
- R. H. Byrne, J. C. Neely, S. Buerger, J. T. Feddema, D. K. Novick, S. E. Rose, B. L. Spletzer, B. R. Sturgis, and D. G. Wilson, "Advanced robot locomotion," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2007-1466, January 2007.
- R. Baker, E. Blansett, R. Byrne, J. Lyle, and T. Wrobel, "Peregrine PE97201 optical transceiver proton single-event upset radiation test final report," Sandia National Laboratories Internal Technical Report, Albuquerque, NM, June 2005.

Technical Reports (continued)

- J. T. Feddema, R. H. Byrne, J. J. Harrington, D. M. Kilman, C. L. Lewis, R. D. Robinett, B. P. V. Leeuwen, and J. G. Young, "Advanced mobile networking, sensing, and controls," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2005-1661, March 2005.
- R. Baker, E. Blansett, R. Byrne, C. Kuznia, J. Lyle, and T. Wrobel, "Peregrine optical transceiver PSC97201 heavy ion single-event upset test," Sandia National Laboratories Internal Technical Report, Albuquerque, NM, January 2005.
- J. T. Feddema, R. D. Robinett, and R. H. Byrne, "Military airborne and maritime application for cooperative behaviors," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2004-4764, September 2004.
- R. Byrne, L. Jones, P. Klarer, B. R. Sturgis, and M. Vaughn, "Moving mass control system feasibility study," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2004-2921, June 2004.
- R. H. Byrne, S. E. Eskridge, J. E. Hurtado, and E. L. Savage, "Algorithms and analysis for underwater vehicle plume tracing," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2003-2643, July 2003.
- D. Schmitt, R. Byrne, J. Feddema, G. Fischer, J. Harrington, C. Little, J. Neely, and B. Rigdon, "Intelligent mobile land mine IMLM system," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. 2003-1186, May 2003.
- E. J. Heller, D. Adkins, R. Byrne, and J. Wolf, "LDRD 10785, integrated microsensors for autonomous microrobots FY02 final report," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2002-4195, February 2003.
- R. Byrne, E. Heller, J. Feddema, T. Weber, K. Wessendorf, B. Spletzer, C. Anderson, J. Bryan, and C. Landron, "Final report: Integration of micro-sensor technology into a miniature robotic vehicle," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND2000-0777, April 2000.
- R. H. Byrne, B. R. Sturgis, M. R. Vaughn, C. T. Coffin, R. D. Robinett, D. V. Zuiden, and J. B. Pulaski, "Moving-mass trim control for precision-strike warheads," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND97-2341, October 1997.
- R. Byrne, J. Pletta, R. Case, and P. Klarer, "Commercial vehicle incident monitors," Sandia National Laboratories Report Prepared for FHWA, OMC, Albuquerque, NM, February 1997.
- R. H. Byrne and W. A. Amai, "Driver monitoring," Sandia National Laboratories Internal Technical Report, Albuquerque, NM, April 1995.
- R. H. Byrne, "The mobile unit tester," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND92-0833, May 1994.
- R. H. Byrne, "Global positioning system receiver evaluation results," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND93-0827, September 1993.
- J. B. Pletta, W. A. Amai, P. R. Klarer, D. Frank, J. Carlson, and R. H. Byrne, "The remote security station RSS final report," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND92-1947, October 1992.
- R. H. Byrne, P. R. Klarer, and J. B. Pletta, "Techniques for autonomous navigation," Sandia National Laboratories, Albuquerque, NM, Tech. Rep. SAND92-0457, March 1992.

U.S. Patents

“Control System for Active Damping of Inter-Area Oscillations”, application in progress.

“Communication enabled fast-acting imbalance reserve”, filed 10/10/2017.

“Cooperative System and Method using Mobile Robots for Testing a Cooperative Search Controller”, U.S. Patent Number 6,408,226, issued 6/18/2002.

“Portable Control Device for Networked Mobile Robots”, U.S. Patent 6,438,456, issued 8/20/2002.

“Cooperating Mobile Robots”, U.S. Patent number 6,687,571, issued 2/3/04.

Recent Competitive Proposal Awards (\$8.7M since 2012)

“Secure, Scalable Control and Communications for Distributed PV”, U.S. Department of Energy SunShot Program, Award 30690, \$2.7M, 2016.

“Multitarget-Multisensor Tracking”, Sandia National Laboratories Internal R&D (LDRD program), Award number 16-0445, \$600K, 2015.

“Distributed Controls for High Penetrations of Renewables”, U.S. Department of Energy SunShot Program, Award 29094, \$454K, 2015.

“Dynamic Simulation over Long Time Periods with 100% Solar Generation”, U.S. Department of Energy SunShot Program, Award 29095, \$350K, 2015.

“Large Scale Tracking of Non-Resolved Targets”, Sandia National Laboratories Internal R&D (LDRD program), Award number 14-0682, \$600K, 2014.

“Wide Area Damping Control Proof-of-Concept”, (co-written with Dan Trudnowski) Bonneville Power Administration, Technology Innovation Grant, Award Number 2013-1522, \$4M (including DOE matching funds), 2012.

Notable Press Releases

https://share.sandia.gov/news/resources/news_releases/smithsonian-robots/#.VsYDDHLrvX4

<http://americanhistory.si.edu/press/releases/smithsonian-adds-robotics-collection-and-invites-public-national-robotics-week>

<http://spectrum.ieee.org/automaton/robotics/military-robots/smithsonian-snaps-up-nine-historic-robots-from-sandia-national-labs>

http://content.time.com/time/specials/packages/article/0,28804,1936165_1936255,00.html

IEEE Activities

| | |
|--------------|---|
| 1991-1992 | Vice-Chair, Albuquerque Section |
| 1993 | Chair, Albuquerque Section |
| 1995 | Treasurer, Albuquerque Section |
| 1996-1999 | Secretary, Albuquerque Section |
| 1999-2003 | Treasurer, Albuquerque Section |
| 2004-2005 | Secretary, Albuquerque Section |
| 2006-2006 | Vice-Chair, Albuquerque Section |
| 2007-2008 | Chair, Albuquerque Section |
| 2010-2011 | Chair, Albuquerque Section |
| 2012-2013 | Treasurer, Albuquerque Section |
| 2014-2015 | Secretary, Albuquerque Section |
| 2016-present | Professional Activities, Albuquerque Section |
| 2017-present | Vice-Chair, Albuquerque Section |
| 2017-present | Energy Storage and Stationary Battery Committee (ESSB) Fellow Coordinator |