Curriculum Vitae

Name: Dakota Roberson
Title: White House Fellow, Assistant Professor *(on leave)*
Department: Electrical & Computer Engineering

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Academic Appointments

- **University of Idaho** — Idaho Falls, ID
  Assistant Professor, Electrical & Computer Engineering — *Aug. 2017 - Present (on leave)*
- **Center for Advanced Energy Studies** — Idaho Falls, ID
  Associate Member — *Aug. 2017 - Present (on leave)*
- **University of Idaho** — Idaho Falls, ID
  Affiliate Faculty, Nuclear Engineering — *Sept. 2018 - Present (on leave)*

Non-Academic Experience & Consulting

- **White House Fellow** — Washington, D.C.
  Appointed by President Donald J. Trump, U.S. Department of Defense — *Aug. 2019 - Present*
- **Chrysalis Energy Systems, LLC** — Wilmington, NC
  Advisor to the Board of Directors — *Jan. 2019 - August 2019*
- **Aktzin Systems** — Laramie, WY & Idaho Falls, ID
  Principal Consultant, Power Systems and Circuit Design — *May 2017 - August 2019*
- **Sandia National Laboratories (Lockheed Martin Corp.)** — Albuquerque, NM
  Electric Power Systems Research, R&D Engineering, Intern — *May 2013 - May 2017*

Education

- **University of Wyoming** — Laramie, WY
  Doctor of Philosophy, Electrical Engineering — *Aug. 2013 – May 2017*
  - **Dissertation**: *On Loop-Shaped HVDC Wide-Area Damping Control*
  - **Graduate Minor**: Statistics
- **University of Wyoming** — Laramie, WY
  Bachelor of Science, Electrical Engineering; Cum Laude; Hons. — *Aug. 2009 – May 2013*
  - **Specialization**: Power System Analysis
  - **Minor**: Mathematics

Scholarship

- **Patents**:

1. **D. Roberson** and J. F. O'Brien, "Variable Loop Gain Using Excessive Regeneration Detection for a Delayed Wide-Area Control System, US Patent No.: 10,355,485 B2," *U.S. Patent & Trademark Office*, Jul. 16, 2019

- **Peer Reviewed**:

1. J. C. Bell, N. Kharadia, and **D. Roberson**, "Fuel Supply Chains in the Western Interconnect: Evaluating Availability During Extreme Weather Events," *The Electricity Journal*, vol. 33, Jan. 2020
2. **D. Roberson** and J. F. OBrien, "Asymmetric Dual Sensor Latency in Distributed Control," *IEEE Transactions on Power Systems*, vol. 34, pp. 4533–4541, Nov. 2019
3. A. Al Rashdan and **D. Roberson**, "A Frequency Domain Control Perspective on Xenon Resistance for Load Following of Thermal Nuclear Reactors," *IEEE Transactions on Nuclear Science*, vol. 66, pp. 2034–2041, Sep. 2019

4. J. Hatton, **D. Roberson**, B. Johnson, and R. Nuqui, "Multi-terminal VSC HVDC Cyberattack Detection and Mitigation," in *2019 IEEE Power Energy Society General Meeting*, Aug. 2019
5. N. Kharadia and **D. Roberson**, "Design & modeling of a micro-reactor power plant for a military base," in *2019 American Nuclear Society Student Conference*, Jan. 2019
6. **D. Roberson** and J. F. OBrien, "Variable loop gain using excessive regeneration detection for a delayed wide-area control system," *IEEE Transactions on Smart Grid*, vol. 9, pp. 6623–6632, Nov. 2018
7. **D. Roberson** and J. F. OBrien, "A Feedback Perspective on Forced Oscillation/Small-Signal Stability Discrimination," in *2018 IEEE Power Energy Society General Meeting (PESGM)*, pp. 1–5, Aug 2018
8. **D. Roberson** and J. F. OBrien, "Loop-shaping methods for multivariable control design for stability augmentation and oscillation rejection in wide-area damping using hvdc," *Elsevier Electric Power Systems Research*, vol. 157, pp. 238–250, April 2018
9. **D. Roberson** and J. F. O'Brien, "A comparison of hvdc damping controllers in the western north american power system," in *2017 IEEE Power Energy Society General Meeting*, pp. 1–5, July 2017
10. **D. Roberson** and J. F. O'Brien, "Transient stability augmentation with excessive regeneration detection in a delayed wadc," in *2017 IEEE Transportation Electrification Conference and Expo (ITEC)*, pp. 311–316, June 2017
11. **D. Roberson** and J. F. OBrien, "Loop shaping of a wide-area damping controller using hvdc," *IEEE Transactions on Power Systems*, vol. 32, pp. 2354–2361, May 2017
12. **D. Roberson** and J. F. O'Brien, "Coupling analysis & preliminary mimo control design for wide-area damping using hvdc," in *2016 North American Power Symposium (NAPS)*, pp. 1–6, Sep. 2016

- **Magazine Articles**:

1. **D. Roberson** et al., "Improving Gird Resilience Using High-Voltage DC: Strengthening the Security of Power System Stability," *IEEE Power and Energy Magazine*, vol. 17, pp. 38–47, May 2019

- **Book Chapters**:

1. **D. Roberson** et al., *Pumped Storage Hydropower Valuation Guidebook: A Cost-Benefit and Decision Analysis Valuation Framework (Chapter 5).* Argonne National Laboratory, 2019

- **Invited Panelist**:

1. **D. Roberson**, "Improving Grid Resilience Using HVDC," *IEEE Power & Energy Society General Meeting*, 2019

- **Pending & In Preparation**:

1. J. F. O'Brien, **D. Roberson**, and D. A. Schoenwald, "Sensor / Actuator Colocation in Distributed Power System Control," *IEEE Transactions on Power Delivery*, submitted Aug. 2019
2. J. Tacke, R. A. Borrelli, and **D. Roberson**, "High Performance Control in Nuclear Energy Systems," *IEEE Transactions on Nuclear Science*, in preparation 2020
3. J. Tacke and **D. Roberson**, "Auto-Synthesis of High Performance Power System Compensators," *IEEE Transactions on Power Systems*, in preparation 2020
4. J. Bell and **D. Roberson**, "Hierarchical Inference and Spoofing Alarm in HVDC Control Systems," *IEEE Transactions on Smart Grids*, in preparation 2020
5. J. F. O'Brien, **D. Roberson**, and D. A. Schoenwald, "Energy Storage Actuation for Wide-Area Damping," *IEEE Transactions on Power Systems*, in preparation 2020

- **Conference Presentations**:

1. **D. Roberson**, "Variable Loop Gain using Excessive Regeneration Detector for a Delayed Wide-area Control System," *IEEE Power & Energy Society General Meeting*, 2018
2. **D. Roberson**, "Loop Shaping of a Wide-area Damping Controller Using HVDC," *IEEE Power & Energy Society General Meeting*, 2017
3. **D. Roberson** and J. W. Pierre, "Asymptotic Cramèr-Rao Lower Bound AR(2) Process, Poster Presentation," *IEEE Power & Energy Society General Meeting*, 2015
4. D. A. Schoenwald, J. C. Neely, R. T. Elliott, R. H. Byrne, **D. Roberson**, D. Trudnowski, and M. K. Donnelly, "Active Power Damping of Inter-Area Oscillations, Poster Presentation, SAND NO. 2013-XXXXP," *Department of Energy Information Session*, 2013

5. D. Sowder, C. Watkins, D. Schoenwald, **D. Roberson**, and D. Borneo, "Duke Energy Substation-Based ESS Smoothing, Poster Session, SAND2013-8848C," *Department of Energy Information Session*, 2013

- **Reports**:

1. **D. Roberson**, J. Ellison, D. Bhatnagar, and D. A. Schoenwald, "Performance of assessment of the pnm prosperity electricity storage project: A study for the doe energy storage systems program," *Sandia National Laboratories, SAND2014-2883*, May 2014

- **Awards**:

  - *Advances in Engineering*, Featured Paper Selection (F'2018)
  - Nicholson Power Systems Engineering Fellowship (F'2014-F'2015)

- **Grants Awarded**:

1. U.S. Department of Energy, Scientific Infrastructure Support for Consolidated Innovative Nuclear Research (CINR), *Co-PI: $285,763*. "NuScale Simulator at the Center for Advanced Energy Studies", 2019. PI: Richard N. Christensen; Co-PIs: R. A. Borrelli, Michael G. McKellar, Michael Haney, David Arcilesi
2. Energy Policy Institute (EPI) / Battelle Energy Alliance , *PI: $26,679*. "Value of Power System Stability Services, with Emphasis on Valuation of Proposed Pumped Storage Hydropower", June 2019 - Sept. 2019
3. Office of Research & Economic Development, University of Idaho , *PI: $35,645*. "Electronics For Frequency-Domain Feedback (EF3): A Laboratory for Brushless DC Motor Control", May 2019 - April 2019
4. Battelle Energy Alliance , *PI: $56,000*. "Indoor Positioning of Drones", March 2019 - Sept. 2019
5. Battelle Energy Alliance , *PI: $24,911*. "Developing Electric Vehicle Charging Control Strategies for Extreme Fast Charging (XFC) Sites", March 2019 - Sept. 2019
6. Battelle Energy Alliance , *PI: $45,794*. "Dynamic Earth Energy Storage: Terawatt-Year, Grid-Scale Energy Storage using Planet Earth as a Thermal Battery (GeoTES)", Oct. 2018 - Sept. 30, 2019. Partners: Lawrence Berkeley National Laboratory, Rocky Mountain Power, Palo Verde Nuclear Generating Station, University of Wyoming
7. Center for Advanced Energy Studies (CAES) / Battelle Energy Alliance , *PI: $20,000*. "Engineering and Design of Cyber-physical Energy Control Systems", May. 2018 - Sept. 2018
8. Design Magnitude, LLC, *PI: $4,000*. "Advanced Multirotor Drone Design", Sept. 2018 - May. 2019
9. U.S. Department of Energy, ABB, *Co-PI: $249,992*. "Cyber Attack Resilient HVDC System", Oct. 2017 - Sept. 2019. PI: Brian K. Johnson; Partner Institutions: Argonne National Laboratory, University of Illinois Urbana-Champagne
10. Fisher Innovation Challenge, *PI: $25,000*. "Aktzin Control Systems: Grid-Scale Energy Storage Control Systems", Jan. 2017 - Aug. 2017
11. Energy Leadership Summit, *PI: $2,000*. "Silicon Valley Leadership Seminars", 2016

- **Unfunded Grant Proposals**:

1. Idaho Global Entrepreneurial Mission, State of Idaho, *Co-PI: $1,997,860*. "Cyber Physical Systems Security Institute", submitted 2019. Partner: Boise State University
2. National Science Foundation, *PI: $297,006*. "AMPS: Bayesian Inference in a Nonlinear Dynamic Compensation Framework", submitted 2019. Partner: West Virginia University
3. Avista Corporation, *Co-PI: $79,877*. "Asset Health Management for Avista System", submitted 2019
4. Battelle Energy Alliance , *Co-PI: $2,500,000 ($200,000 as University PI)*. "Flexible Geothermal Power Generation Utilizing Geologic Thermal Energy Storage", Sept. 2019 - July, 2021. Partners: Lawrence Berkeley National Laboratory, PacifiCorp, Arizona Public Services, University of Wyoming, National Renewable Energy Laboratory
5. U.S. Department of Energy, *PI: $672,489*. "Embedded Precursor Detection in Synchrophasor Measurements: A Data-Driven Approach", 2019. Partner: George Mason University
6. National Science Foundation: Harnessing the Data Revolution (HDR), *PI*. "NSF HDR Ideas Labs (I-DIRESE-IL): Data-Intensive Expansion of Automatic Control Systems (preproposal)", 2019
7. National Science Foundation, *Co-PI: $824,139*. "CPS: Medium: Collaborative Research: An Integrated Sensor-Drone-Satellite Analyzer System to Enhance Soil-Crop Health", 2018. Partner: Idaho State University

8. Battelle Energy Alliance, *PI.* "Laboratory Directed R&D: INL/CAES - University of Idaho Pilot Program for Encouraging Domestic Students to Pursue Advanced Academic Degrees in Power Systems Engineering", 2018
9. U.S. Air Force Research Laboratory, *PI: $416,738.* "Reconfigurable Feedback Control for Multiscale Structures Subject to Non-stationary Conditions", 2018
10. Alfred P. Sloan Foundation, *Co-PI: $241,343.* "Smart Asset Health Management for Electric Power Systems", 2018
11. U.S. Department of Energy, *Co-PI: $749,786.* "Visualization of Dynamic Systems in the Computer Assisted Virtual Environment: A Collaborative Research Venture at the Center for Advanced Energy Studies", 2018
12. U.S. Department of Energy, *PI: $200,000.* "ARPA-E: HomeBase Energy Management System for the Nanogrid", 2018. Partner: InergyTech
13. Avista Corporation, *Co-PI: $79,877.* "Asset Health Management for Avista System", 2018
14. Idaho Department of Commerce IGEM, *Co-PI: $240,000.* "HomeBase with 6kW GaN Split Phased Inverter", 2018. InergyTech
15. U.S. Department of Energy, Office of Fossil Energy, *PI: $312,416.* "Innovative AVR and Electronic Excitation Strategies for Synchronous Machines", 2018. Partner: University of Wyoming
16. University of Idaho Office of Research & Economic Development, *PI: $11,944.* "Seed Grant: Cyber-Physical Systems Reverse Engineering and Forensics Laboratory", 2018
17. U.S. Department of Energy, SunShot, *Co-PI: $600,000.* "SETO: Integrated Front-End Control and Back-End Analytics for Solar PVs", 2018. Partner: Idaho National Laboratory
18. NASA Idaho Space Grant Consortium, *PI: $47,552.* "High-Performance Control and Automation Education for Underrepresented Student Recruitment and Retention", 2017
19. National Science Foundation, *PI: $616,816.* "EPCN: Cyber-Physical Learning Paradigms Responsive to Feedback Compensator Output", 2017. Partner: University of Wyoming
20. National Science Foundation, *Co-PI: $298,684.* "SaTC: EDU: Cyberphysical systems Forensics and Reverse Engineering Lab and Curriculum Development", 2017
21. U.S. Office of Naval Research, *PI: $788,350.* "Learning Paradigms Responsive to Feedback Compensator Output", 2017. Partner: University of Wyoming
22. U.S. Department of Energy, *PI: $125,000.* "ARPA-E: Advanced Control Systems for Distributed Power Systems", 2017. Partner: University of Wyoming

Teaching Accomplishments

- **University of Idaho**
  Areas of Specialization: Power Systems, Automatic Control Systems
  - **Courses Taught**:
    - Advanced Frequency-Domain Control, ECE 504, (S'2018)
    - Power System Stability, ECE 521, (F'2017, S'2019)
    - Control Systems, ECE 470 / ME 481, (F'2018)
  - **Graduate Students Advised**:
    - John Tacke, M.S.E.E., (F'2019 - Present)
    - Kendall Bean, M.S.E.E., (F'2019 - Present)
    - John Bell, M.S.E.E., (F'2018 - Present)
    - Nephi Kharadia, M.S.E.E., (F'2018 - Present)
    - Arthur Peck, M.S.E.E., (F'2018-Present)
    - Michael L. Pokallus, M.S.E.E. (S'2018 - Present)
    - Kimberly A. Cattelan, M.E.E.E. (S'2018 - Present)
  - **Graduate Student Committee Service**:
    - Kelley Verner, Ph.D., (Expected Grad. S'2020)
    - Robert L. Cloud, Ph.D., External (Expected Grad. S'2020)
    - Don Scoffield, M.S.E.E., (Graduated S'2019)
    - Jessica Hatton, M.S.E.E., (Graduated S'2018)
    - David Arnett, M.S.E.E., (Graduated S'2018)

- **Undergraduate Student Project Sponsorship**:
  - 5 Student Team, B.S. Electrical Engineering Capstone Design: "Advanced Multirotor Drone Design", (F'2018-S'2019)
  - 4 Student Team, B.S. Mechanical Engineering Capstone Design: "Small-scale Maximum Power Point Tracking Photovoltaic System", Brigham Young University - Idaho (S'2018)
- **Non-credit Classes, Workshops, Seminars, Invited Lectures, etc.**:
  - Invited Lecture: Idaho National Laboratory Energy Storage and Electric Vehicles Group "High-Performance Control Strategies" (S'2019)
  - Invited Lecture: ECE Undergraduate Students at University of Idaho: "The Versatility of Energy Detection", Moscow, ID. (F'2018)
  - Invited Lecture: Codebreakers CAES Seminar Series: "Power System (In)Stability in the West", Idaho Falls, ID. (S'2018)
  - Invited Lecture: to ECE Undergraduate Students at University of Idaho: "High-Performance Wide-Area Damping Control", Moscow, ID. (F'2017)
  - Invited Lecture: IEEE Eastern Idaho Section: "Brew with the Crew: Innovations in Energy Detection", Idaho Falls, ID. (F'2018)
  - Guest Lecturer: Resilient Control of Critical Infrastructure, ECE469, (F'2017, F'2018)

- **University of Wyoming**
  Areas of Specialization: Power Systems, Signal Processing
  - **Courses Taught**:
    - Digital Signal Processing (partial), ECE 4220, (F'2015)
    - Electromechanics Laboratory, ECE 5410, (F'2013)
    - Orientation to Engineering (TA), ES 1000, (F'2011, S'2012)
  - **Non-credit Classes, Workshops, Seminars, Invited Lectures, etc.**:
    - "On Loop-Shaped HVDC Wide-Area Damping Control", Faculty & Graduate Student Seminar on wide-area control, ECE Department, University of Wyoming, (S'2017)
    - "The System", Faculty & Graduate Student Seminar on the western North American Power System, ECE Department, University of Wyoming, Laramie, WY (F'2015)
    - "A Cool Way to Spend Your Summer", Presentation to IEEE Student Chapter, University of Wyoming RE: Research at Sandia National Labs, Laramie, WY (F'2013)

Service

- **Professional and Scholarly Organizations**:
  - Institute of Electrical and Electronics Engineers (IEEE)
    - Member (2010 - present)
  - IEEE Power & Energy Society
    - Member (2011 - present)
  - Scholastic Peer Review:
    - *IEEE Transactions on Industrial Informatics*
    - *IET Generation, Transmission & Distribution*
    - *IEEE Transactions on Power Systems*
    - *Elsevier Electric Power Systems Research*
    - *IEEE PES General Meeting*
  - Tau Beta Pi
    - Member (2012 - present)
    - Chairperson (2013 - 2016)
    - President WY-A (2014 - 2015)

- **Awards**:

- Tau Beta Pi Outstanding Member (2015-2016)

- **Major Committee Assignments**:
  - Founder and Coordinator, *Codebreaker: CAES Seminar Series*, Multi-institutional (F'2017-present)
  - ECE Power Systems Committee; Departmental (F'2017-present)
  - ECE Chair Search Committee; Departmental (S'2019)
  - ECE Interim Chair Search Committee; Departmental (F'2018)
  - Computer Science IGEM Faculty Search; College (S'2018)
  - Dean's Academic Dishonesty Appeal Panel Chairperson; University of Wyoming, College (2013-2017)
  - College of Engineering & Applied Sciences Ambassador; University of Wyoming, College (2012-2017)

- **Outreach Service**:
  - Invited Lecture: Brigham Young University - Idaho IEEE and ASME Student Sections: "The Versatility of Energy Detection", Rexburg, ID (S'2018)
  - Invited Lecture: Rock Springs High School, Rock Springs, WY: "Power Systems at UWYO" (S'2015,S'2016)
  - Invited Lecture: *A Study for the DOE Energy Storage Systems Program*, Albuquerque, NM and Livermore, CA: "Performance Assessment of the PNM Prosperity Electricity Storage Project" (F'2014)

- **Continued Education**:
  - Sunnylands Media and Crisis Communication Training w/ Dr. Kathleen Hall Jamieson (2019)

- **Community Engagement**:
  - Snake River Cutthroats Fly Fishing, Member (2017 - present)
  - Blackfoot River Bowmen, Member (2018 - present)
  - High Plains Archery Club
    - President (2016-2017)
    - Vice President (2015-2016)
    - Member (2013-2017)
  - Laramie Dirt Riders Motocross Club
    - President (2015-2016)
    - Member (2011-2017)
  - Albany County Sheriff's Office Search & Rescue (2015-2017)
    - First Aid and Wilderness Responder Training