Robert Sterling Spencer

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EDUCATION

Master of Science, Environmental and Water Resources Engineering Graduated: Dec 2016
University of Texas at Austin | GPA: 3.86

Bachelor of Science, Environmental Engineering Graduated: Dec 2014
University of Colorado at Boulder | GPA: 3.42 | Dean's List (5)

RELEVANT WORK EXPERIENCE

National Renewable Energy Laboratory (NREL) Golden, CO 80401 Mar 2017 - Present
Researcher III – Data Scientist & Engineer | Data Science and Innovation Group

- Lead developer and creator of Engage, a highly accessible and flexible web-based energy planning model for rapid multi-sectoral scenario exploration. Its cloud-based shared data model, intuitive interface and visualizations facilitate collaboration and communication among diverse stakeholder groups, teams, and experts.
- R&D of novel methods in geospatial predictive analytics for assessing techno-economic potential of renewable energy resources and their longterm impacts.
- Crowdsourcing and standardizing of industry and government data for enhanced accessibility and search-ability.
- Creating interactive and immersive visualizations for exploring and analyzing large multi-dimensional datasets.
- Parallel processing of big data on NREL's High Performance Computer (HPC) and Amazon Web Services (AWS)

Kaleid, LLC Denver, CO 80401 Oct 2018 – Present
Founder - A grassroots media platform for exploring the best ideas from all sides of controversial topics.

Science Systems and Applications, Inc. (SSAI) Greenbelt, MD 20771 Mar 2017 – Mar 2018
Scientific Programmer/Analyst I (See descriptions below for NASA: Goddard Space Flight Center)

NASA: Goddard Space Flight Center (GSFC) Greenbelt, MD 20771 Jun 2016 - Dec 2016
Student Research Assistant (Aug 2016 – Dec 2016) **|** **Graduate Intern** (Jun 2016 – Aug 2016)

- Evaluated a satellite retrieval algorithm's quality assurance for atmospheric aerosols by performing geospatial and temporal collocations and exploratory data analysis with aircraft and ground-based instruments.
- Developed scripts to extract, sample, and visualize key areas from large remote sensing datasets and imagery.
- Aided atmospheric scientists in characterizing the interactions and uncertainties between aerosols and clouds.

University of Texas Center for Research in Water Resources Austin, TX 78705 Jan 2016 - May 2016
Graduate Research Assistant

- Developed a framework and workflow for producing planning maps for emergency responders in flooding events.
- Visualized probable flooding depths and velocities at river crossings for road closures from a hydraulic model.
- Worked with stakeholders to optimize communication interfaces between forecasting systems and firefighters.

Institute of Arctic and Alpine Research Boulder, CO 80303 May 2013 - Aug 2015
Antarctic Field Research Grantee McMurdo Dry Valleys LTER, Antarctica Dec 2014 - Feb 2015

- Procured climate and ecological data through stream flow measurements, land surveying, water quality sampling, and algal mass collection, while maintaining a network of hydrologic stream gauges in Antarctica.
- Lived and worked among a small efficient team while inhabiting Antarctica's extreme environments.

Undergraduate Research Assistant

- Rectified and published raw stream flow, rating curve, and water quality records for an online database.
- Developed a regression analysis to model synthetic hydraulic behaviors of a glacier-fed stream.
- Conducted sampling and tracer studies at various rivers and lakes within Colorado's watersheds.
- Assisted with preparing graduate research papers for publication through peer review sessions.

RELEVANT VOLUNTEER EXPERIENCE

Engineers Without Borders, University of Colorado's Nepal Team Mar 2011 - May 2013
Project Design Leader (May 2012 – May 2013) **|** **Treasurer** (Dec 2011 – Dec 2012)

- Effectively provided clean drinking water to a developing community of over 200 Nepali people by designing and constructing a protection system and tap stand for a fresh water spring.
- Ensured sustainability of a water treatment system for a hospital in Nepal by composing an O&M plan.
- Collected, compiled, and assessed land survey data and performed water quality tests on spring sources.
- Obtained approval to implement technical design plans through collaboration with licensed engineers.
- Documented health and safety forms pertaining to site and travel safety.

- Developed strong relationships with the community by participating in user group and municipality meetings.
- Successfully maintained an annual budget of approximately $100,000 by managing withdrawals and spending.
- Secured funding through writing grant proposals, organizing fundraiser events, and presenting to rotaries.

Other Activities and Affiliations

- Freelance Private Tutoring for all levels of STEM topics — Aug 2015 – Feb 2017
- American Geophysical Union — Aug 2016 – Present
- American Water Works Association – Rocky Mountain Region — Oct 2011 - Present
- Society of Environmental Engineers — Aug 2011 - Dec 2014
- Volunteering – Habitat for Humanity, Volunteers for Outdoor Colorado

Awards and Honors

- An NREL Key Contributor (4 out of 4 years) — 2020
- NASA Goddard Summer Student Award – 1st Place — 2016
- NSF's Antarctica Service Medal of the United States of America — 2015
- RMWEA/RMSAWWA Student Design Competition – 2nd Place — 2014
- Engineers Without Borders – Chapter of the Year Award — 2012
- Art Institute Scholarship – 2nd Place — 2009

Publications

- Spencer, R. S., Levy, R. C., Remer, L. A., Mattoo, S., Arnold, G. T., Hlavka, D. L., et al. (2019). Exploring aerosols near clouds with high−spatial−resolution aircraft remote sensing during SEAC4RS. Journal of Geophysical Research: Atmospheres, 124, 2148– 2173. https://doi.org/10.1029/2018JD028989
- Spencer, R. S., Macknick, J., Aznar, A., Warren A., and Reese, M. O. (2019). Floating Photovoltaic Systems: Assessing the Technical Potential of Photovoltaic Systems on Man-Made Water Bodies in the Continental United States. Environmental Science & Technology 2019 53 (3), 1680-1689. DOI: 10.1021/acs.est.8b04735
- Liber, W. Bartle, C., Spencer, R., Macknick, J., Cagle, A., Lewis, T. Colorado's Statewide Potential Study for the Implementation of Floating Solar Photovoltaic Arrays (2020). Colorado Energy Office. https://drive.google.com/file/d/1PjrwsUeXygNyW7xBBvcZyxTRT8aB19N3/view
- Lee, N. Grunwald, U, Rosenlieb, E., Mirletz H., Aznar, A., Spencer, R., Cox, S. (2020). Hybrid floating solar photovoltaics-hydropower systems: Benefits and global assessment of technical potential. Renewable Energy. Volume 162. Pages 1415-1427. https://doi.org/10.1016/j.renene.2020.08.080.
- Koebrich, S., Sigrin B., Spencer R., Schwabe P., Haase S., Choi S., Kramer J. (2021). Distributed Solar Adoption in Orlando: A household-level model for distribution resource planning. National Renewable Energy Laboratory, Orlando Utilities Commission. NREL PR-6A20-77308. https://www.nrel.gov/docs/fy21osti/77308.pdf
- [PENDING] Characterizing land-cover under utility-scale solar to understand food-energy-water impacts

Skills: Algorithm Development | Spatiotemporal Data Analysis | Visualization | Uncertainty Modeling (Monte Carlo Simulation, Multivariate, Extreme Value) | Systems Modeling | Multi-objective Optimization | L/NL/MIL Programming | Bayesian Inference | Decision Trees | Hypothesis Testing | Machine Learning (ANN, SVM, Clustering) | Data Curation/QA | Cost-Benefit Analysis

Tools: Python | Django | ArcGIS | SAS | SQL | R | Bash | GAMS | CPLEX | LaTeX | GitHub | Matlab | VBA | Adobe | HTML/CSS | JavaScript | D3 | Ruby on Rails | Docker | Postgres | Scrum | AnyLogic | AWS | Celery | Redis | Earth Engine

Courses: Air Pollution Control | Environmental Fluid Mechanics | Sampling & Analyses | Material & Energy Balances | Heat Transfer | Thermodynamics | Decision, Risk, and Reliability | Engineering Processes | Ecology | Geomorphology | Hydrology | Groundwater Engineering | Sustainability & Renewable Energy | GIS | Systems Engineering | Regression Analysis | Water Resources Planning & Management | Physical and Chemical Treatment | Material & Energy Balances