

# J.R. POWERS-LUHN

jpowersl@vols.utk.edu ◊ (757) · 286 · 9023

## EDUCATION

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Ph.D.	<b>University of Tennessee–Knoxville</b> Nuclear Engineering, with a certificate in Nuclear Security	est. 2020
M.E.M.	<b>Old Dominion University</b> Engineering Management	2017
B.S.	<b>University of Virginia</b> Physics	2004

## PROFESSIONAL EXPERIENCE

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**University of Tennessee–Knoxville** Aug. 2016 - Present  
*Graduate Research Assistant / NSSC Fellow* Knoxville, TN

- Developing neural network model to correct misalignment in associated particle imager
- Developing portable, miniaturized associated particle imager for nuclear security
- Designed OpenMPI software tool for synthesizing multiple single-threaded monte carlo simulations
- Constructed MCNP models to allow for data augmentation for training networks on ORNL NMIS system
- Performed CT reconstruction sensitivity to assess the impact of measurement error on image analysis

**Lawrence Livermore National Laboratory** May 2019 - Aug. 2019  
*Data Science Summer Intern* Livermore, CA

- Used long short-term memory neural networks to categorize operations for nuclear facilities
- Used machine learning and natural language processing tools to predict properties for new molecules

**Intercap Energy Systems** May 2011 - Aug. 2016  
*Data Scientist* Baltimore, MD

- Developed regression models to predict commercial building load curves
- Developed and deployed Apache Tomcat based product to manage building operations strategies
- Managed software deployments in Amazon AWS and on-site data centers

**U.S. Navy and Navy Reserves** May 2004 - Present  
*Submarine Officer* Various, worldwide

- Supervised major upgrade of reactor instrumentation and control system
- Completed two missions vital to national security
- Qualified Senior Reactor Operator (equivalent)

## TEACHING EXPERIENCE

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**University of Tennessee–Knoxville**  
*Graduate Research Assistant in Nuclear Engineering*

Aug. 2016 - Present  
*Knoxville, TN*

- NE 530, Nuclear Security (graduate-level)

## SELECTED COURSEWORK

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- Machine Learning (COSC 528): Derivation and implementation of machine learning algorithms for classification and regression
- Empirical Modeling and Diagnostics (NE 579): Parametric and non-parametric regression techniques, model regularization, and fault detection
- Operations Research (ENMA 603): Deterministic and stochastic models for decision making

## COMPUTER SKILLS

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<b>Languages</b>	Python, C++
<b>Versioning and Testing</b>	git, PyTest
<b>Tools</b>	Pandas, Keras, TensorFlow, Flask, L <sup>A</sup> T <sub>E</sub> X, Matlab, Jupyter, MPI, AWS, Astra computed tomography toolkit
<b>Nuclear Software</b>	MCNP

## SECURITY CLEARANCE

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DoD: Top Secret, SCI eligible  
DoE: Q

## HONORS AND AWARDS

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Navy Achievement Medal	2007, 2008, 2014
Navy Commendation Medal	2008, 2011
Alpha Nu Sigma Honor Society	2016
NSSC Fellow	2016-2020

## PRESENTATIONS AND POSTERS

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- J.R. Powers-Luhn. “Neutron array alignment determination in an associated particle imaging system.” Pacific Northwest National Laboratory, Richland, WA, April 2020.
- J.R. Powers-Luhn, G. Konjevod. “Long short-term memory networks for diversion detection.” (poster) Lawrence Livermore National Laboratory, Livermore, CA, August 2019.
- J.R. Powers-Luhn, J. Auxier, D. Miller, D. Penchoff, H.L. Hall. “Cavity ring-down spectroscopy for isotopic measurements.” (poster) 2017 University Program Review, Walnut Creek, CA, June, 2017.
- J.R. Powers-Luhn. “Re-tuning buildings: Using predictive analytics to control building demand.” Sandia National Laboratory, Livermore, CA, October, 2014.