GUILLAUME L'HER

Denver, Colorado
glher(at)mines(dot)edu

EDUCATION

PhD Colorado School of Mines, Nuclear Engineering — May 2022
Dissertation: "A Multifaceted Approach to Nuclear Energy in a Complex World"
Committee: M. Bazilian (chair), M. Deinert, A. Osborne, J. Shafer, N. Duncan

MS University Paris-Saclay - INSTN, Nuclear Engineering — May 2012

BS University Paris-Saclay, Physics — May 2010
Minored in Mathematics

HONORS AND AWARDS

Rath Research Award Nomination — 2022
This award recognizes the Colorado School of Mines doctoral graduates whose theses demonstrate the greatest potential for societal impact

NRC Fellowship — 2016

EDF Nuclear Production Innovation of the Year — 2015
This award recognizes a project that is deemed as the most innovative for the production department of EDF

RESEARCH AND WORK EXPERIENCE

World Bank Group, USA — 2019 to 2023
Consultant

- Analyzed infrastructure exposure and resilience to natural hazards in the Caribbean
- Performed a network disruption analysis on infrastructure and supply chain
- Derived economic impacts of climate change in Brazil in the context of the Brazilian Country Climate and Development Report (CCDR)
- Analyzed the natural hazards exposure in multiple African countries
- Resilience analysis for Beyond the Gap in South Africa

TerraAnalytics, Inc., USA — 2018 to 2023
Co-Founder

- Developed the database, back-end and front-end design
- Managed the servers
- Developed algorithms applied to hazards data

Colorado School of Mines, USA 2022 to 2023
Research Associate, Deinert Research Group
Risk and Reliability Analysis

- Developed a framework for failure propagation in nuclear plant design applied to the early conceptual stages of designs

Nuclear Engineering

- Explored material damage reduction and design optimization for advanced nuclear reactors
- Developed a time dependent 3D diffusion code software based on a Jacobian Free Newton-Krylov solver (ReDINKS)

Geospatial Analysis

- Assessed nuclear reactors siting potential
- Derived climate and natural hazards consequences on energy and infrastructure systems
- Assessed residential Solar development pathways in the United States

Data Science

- Used machine learning to explore public opinions on energies on social media
- Obtained the half-life of adverse events on mainstream energies

Colorado School of Mines, USA 2017 to 2022
Graduate Research Assistant, Deinert Research Group

ConverDyn, USA 2017
Data Consultant – Engineering Intern

- Recommended customer (industrial and governmental) contracts negotiation strategies

Colorado School of Mines, USA 2016
Graduate Research Assistant, Van Bossuyt Research Group

Electricité de France (EDF), France 2012 to 2016
Senior Nuclear Engineer, Nuclear Production Division

- Was the Lead Developer for the safety analysis application
- Performed Real-time and accidental transient analyses for in operation reactors
- Performed Safety studies for the new reactor design EPR
- Created AREP and STEP, applications used by every nuclear reactor in France
- Presented EDF calculation chain performance to the French national regulatory commission
- Carried responsibility for the calculation code and neutronic database used in safety studies
- Studied the performance of a new core calculation scheme based on the simplified Pn/SN method

TEACHING EXPERIENCE

Colorado School of Mines, USA May 2016 to May 2022

Part-time Instructor and Lecturer, Mechanical and Nuclear Engineering

- Risk and Reliability Engineering course
  - Presented the use of the SAPHIRE software and designed the final project
- Nuclear Reactor Physics course
  - Presented the analytical solutions to various core geometries
  - Held mathematical-oriented blackboard sessions
  - Developed a code-based projects for students
  - Graded homework and final project
- Computational Nuclear Physics course
  - Numerical uncertainties

PUBLICATIONS

Journal Publications

Duncan, N., **L'Her, G.**, Osborne, A., Schweikert, A., Sawyer, S. and Deinert, M., forthcoming, 2022. Non-Pharmaceutical Interventions Prevented ~ 250 Million United States SARS-CoV-2 Infections. Royal Society Open Science. ***(co- first author)***

Schweikert, A.E., Flanagan, R.R., Bui, J.T., **L'Her, G.F.**, Kerber, S.W., Elvidge, C.D. and Deinert, M.R., 2022. Mobility, nightlights and air pollution during the early phases of the SARS-CoV-2 pandemic. Environmental Research Communications, 4(4), p.041003.

G. F. L'Her, Schweikert, A. E., and M. R. Deinert. "Simple method for identifying interdependencies in service delivery in critical infrastructure networks." Applied Network Science 6, no. 1 (2021): 1-13. ***(co- first author)***

Schweikert, A., **L'Her, G.** and Deinert, M., 2020. Resilience in the Caribbean: Natural Hazards Exposure Assessment and Areas for Future Work, The World Bank

L'Her, G., Van Bossuyt, D.L. and O'Halloran, B.M., 2017. Prognostic systems representation in a function-based bayesian model during engineering design. International Journal of Prognostics and Health Management, 8(2), p.23.

Cooley, B.J., Thatcher, T.W., Hashmi, S.M., **L'Her, G.**, Le, H.H., Hurwitz, D.A., Provenzano, D., Touhami, A. and Gordon, V.D., 2013. The extracellular polysaccharide Pel makes the attachment of P. aeruginosa to surfaces symmetric and short-ranged. Soft Matter, 9(14), pp.3871-3876

Journal Papers in Review and Forthcoming

L'Her, G., Kemp, R., Bazilian, M., Deinert, M., forthcoming, 2023. Potential for small and micro modular reactors to electrify developing regions. *Submitted*.

Kerber, S., Duncan, N., **L'Her, G.**, Bazilian, M., Elvidge, C., Deinert, M., forthcoming, 2023. Tracking electricity losses and their perceived causes using nighttime light and social media. *Submitted.*

L'Her, G., Osborne, A., Flanagan, R., Deinert, M., forthcoming, 2023. The benefits of residential solar depend on the local cost and carbon signature of electricity. *In Progress.*

L'Her, G., Duncan, N., Deinert, M., forthcoming, 2023. Perception of energy technologies varies geospatially and in how it recovers after adverse events. *In Progress.*

Kerber, S., Flanagan, R., **L'Her, G.**, Rabiti, C., Worsham, E., Hansen, J., Deinert, M., forthcoming, 2023. Integrated Energy System with hydrogen production energy storage and carbon taxes. *In Progress.*

Internal Publications

L'Her, G., Angers, L., 2016. A presentation of the performance of the French nuclear fleet to fuel partners ENUSA and Westinghouse. EDF Nuclear Production, Paris, France
Dorville, J., **L'Her, G.**, Thomas, M., Courau, T., Freude, T., Angers, L., 2015. NACRE (New Refueling Safety Calculation Application) v2: An improved calculation code. EDF Nuclear Production, Lyon, France

L'Her, G., 2015. Experimental feedback analysis of the 2015 ramp experiments in every French nuclear reactors. EDF Nuclear Production, Lyon, France

L'Her, G., Guillemin, P., 2014. Experimental feedback analysis of the 2014 ramp experiments in every French nuclear reactors. EDF Nuclear Production, Lyon, France

L'Her, G., Freude, T., Camand, C., 2014. Neutronic impact of assembly repairs with INOX pins in French nuclear reactors. EDF Nuclear Production, Lyon, France

Leclercq, L., **L'Her, G.**, Freude, T., 2014. Safety analysis of the potential refueling of used assemblies. EDF Nuclear Production, Lyon, France
L'her, G., Leclercq, L., 2013. Creation of a neutronics library using APOLLO2 transport code for a Westinghouse UOX fuel assembly for use in NACRE. EDF Nuclear Production, Lyon, France

Guillemin, P., **L'Her, G.**, 2013. Experimental feedback analysis of the 2013 ramp experiments in every French nuclear reactors. EDF Nuclear Production, Lyon, France

L'Her, G., 2012. Reflector models in two-groups diffusion and for multi-group SPN calculations. Master of Science Thesis, National Institute of Nuclear Science and Technology, CEA, Paris, France

Conference Papers

(Abstract-Reviewed)

L'Her, G., Deinert, M., 2021. Impact of Fuel Supply Chain Disruptions on Energy Resilience: A case for Nuclear Energy. TWoFCS International Workshop 2021, Aix-En-Provence, France

PRESENTATIONS AND INVITED LECTURES

Paper Presentation, "Prognostic systems representation in a function-based bayesian model during engineering design.," Prognostics and Health Management conference, Utrecht, Netherlands, 2018.

Workshop, "Impact of Fuel Supply Chain Disruptions on Energy Resilience: A case for Nuclear Energy," TWoFCS International Workshop 2021, Aix-En-Provence, France.

Invited Speaker at the United States Military Academy at West Point 2023

Invited Speaker at the Colorado School of Mines 2023

PROFESSIONAL TRAINING

Complexity Interactive
Santa Fe Institute, Santa Fe, NM, 2020
Description: Complexity Interactive provides a foundation for thinking broadly about complex systems, encouraging participants to explore syntheses across systems in an open dialog with SFI faculty

Complex Systems Summer School
Santa Fe Institute, Santa Fe, NM, 2022
Description: Develop a deeper understanding of the theory and methods used to describe and predict the behavior of complex systems, explore the latest applications of complex systems science to diverse research questions, and collaborate on a transdisciplinary research project in complex systems science

PROFESSIONAL AFFILIATIONS

American Nuclear Society, 2017-2022

Nuclear Engineering Student Delegation, 2021

Every year, about sixteen of the U.S. brightest students head to Washington, D.C. to discuss the issues facing nuclear energy, policy, education, and research with key policymakers.

LANGUAGES

French: Native Language

English: ACTFL Distinguished level in Listening, Speaking, Reading, and Writing

COMPUTER SKILLS

Programming: Python, Java, C, C++, Fortran, Javascript, Matlab

Applications: QGIS, SQL, PostgreSQL, PostGIS, Kepler.gl, SAPHIRE, MCNP, SERPENT, APOLLO2, COCCINELLE, etc.

Platforms: Linux, Windows, Mac

OTHER SKILLS

Engineering: Bayesian Networks, Monte Carlo, Database Management, Computational Physics, Geospatial Information Systems, Computer Vision, Machine Learning

Personal: Public speaking, Technical writing, Small team management, Project planning, Teaching

OTHER

Hobbies: Tennis, Triathlon, Hiking, Reading

Dual citizenship: USA, France

REFERENCES

Dr. Mark Deinert, Associate Professor
Mechanical Engineering
Colorado School of Mines
Email: mdeinert(at)mines(dot)edu

Dr. Andrew Osborne, Assistant Professor
Mechanical Engineering
Colorado School of Mines
Email: osbornea(at)mines(dot)edu

Dr. Nick Duncan, Lieutenant Colonel, Director,
Nuclear Science and Research Engineering Center
United States Military Academy, West Point
Email: nickolas.duncan(at)westpoint(dot)edu

Laetitia Angers, Manager
Nuclear Engineer
Electricite de France (EDF)
Email: laetitia.angers(at)edf(dot)fr