

CONTACT INFORMATION Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831
dugankj@ornl.gov

EDUCATION **Université de Paris Sud XI**, Orsay, FRANCE October 2013 – October 2016
Commissariat à l'Énergie Atomique, Saclay, FRANCE
Ph.D. in Nuclear Energy

Texas A&M University, College Station, TX, USA August 2011 – August 2013
M.S. Nuclear Engineering
GPR: 3.900/4.0

Texas A&M University, College Station, TX, USA August 2007 – May 2011
B.S. Nuclear Engineering
GPR: 3.547/4.0

SELECTED PUBLICATIONS **K. Dugan**, I. Zmijarevic, R. Sanchez, “Cross Section Homogenization for Reactivity Induced Transient Calculations,” *Journal of Computational and Theoretical Transport*, 45(6):425–441, 2016
<http://dx.doi.org/10.1080/23324309.2016.1188116>

Conference Proceedings

K. Dugan, I. Zmijarevic, R. Sanchez, “Cross Section Homogenization Technique for Transient Calculations,” *PHYSOR (2016)*, May 2016, Sun Valley, ID

K. Dugan, I. Zmijarevic, R. Sanchez, “Cross Section Homogenization for Transient Calculations,” *International Conference on Transport Theory*, September 2015, Taormina (Italy)

B. T. Rearden, **K. Dugan**, F. Havluj, “Quantification of Uncertainties and Correlations in Criticality Experiments with SCALE,” *Nuclear Criticality and Safety Division, ANS*, September 2013

K. Dugan, J. Ragusa, D. Lebrun-Grandie, “Hp-FEM Automatic-Mesh Adaptivity Applied to Two Dimensional Neutron Diffusion”, *ANS Winter Conference*, November 2011, Washington D.C.

L. Vasudevan, **K. Dugan**, A. Tijerina, “A Standardized Approach for Low Level Waste Quantification at the Texas A&M Nuclear Science Center using Gamma Spectroscopy and ISOCS Mathematical Calibration Software”, *National Health Physics Meeting*, June 2010.

Theses

K. Dugan, “Developing a Multiphysics Solver in APOLLO3 and Applications to Cross Section Homogenization,” *Université Paris-Saclay*, 2016
<https://tel.archives-ouvertes.fr/tel-01531828>

K. Dugan, “Dynamic Adaptive Multimesh Refinement for Coupled Physics Equations Applicable to Nuclear Engineering,” *Texas A&M University*, 2013
<http://hdl.handle.net/1969.1/151073>

WORK HISTORY **Postdoctoral Fellow** June 2017 – Present
Oak Ridge National Laboratory
Reactor Physics Group
Description: Working on the NEAMS Workbench to facilitate coupled physics simulations.

Ph.D. Student

October 2013 – October 2016

Commissariat à l'Énergie Atomique (CEA), Saclay, FRANCE

DEN/DM2S/SERMA/LTSD

Description: To build a multiphysics framework within the APOLLO3 software package. The framework will use matrix-free methods and will support coupling between neutron transport and thermal hydraulics. Special attention was devoted to the treatment of homogenized cross sections in transient simulations.

Graduate Research Assistant

August 2011 – August 2013

Texas A&M University, College Station, TX, USA

Department of Nuclear Engineering

Description: To build a high fidelity model of coupled physics important to reactor analysis. The proposed method uses the mesh adaptive finite element method which can utilize the Deal.II FEM library written in C++. The physics modeled are two-group transient neutron diffusion and non-linear heat conduction.

Summer Internship

May 2012 – August 2012

Oak Ridge National Lab, Oak Ridge, TN, USA

Reactor and Nuclear Systems Division

Description: Built a tool for the SCALE suite that evaluates how manufacturing tolerances impact the behavior of k-eff. This tool also handles the situation where parameters within a model are correlated and when possible correlations exist between different models. The tool was later incorporated in the SCALE 6.2 release.

Reactor Operator/ Health Physicist

May 2009 – May 2011

Nuclear Science Center, College Station, TX, USA

Description: A reactor operator ensures the safe operation of the reactor facility, and also performs necessary maintenance on the reactor (1MW TRIGA). A health physicist performs environmental surveys on the facility and conducts analysis experiments using the available reactor.

CERTIFICATIONS Senior Reactor Operator License November 2010 – December 2012
Reactor Operator License March 2010 – November 2010

REFERENCES **Dr. Igor Zmijarevic** Ph.D. Research Advisor CEA - Saclay FRANCE
Dr. Richard Sanchez Ph.D. Research Advisor CEA - Saclay FRANCE

Dr. Jean Ragusa Master's Research Advisor Texas A&M University College Station, TX, USA
Dr. Brad Rearden SCALE Project Leader Oak Ridge National Lab Oak Ridge, TN, USA

Jerry Newhouse Reactor Supervisor TAMU Nuclear Science Center College Station, TX, USA
Dr. Latha Vasudevan Radiation Safety Officer Texas A&M University College Station, TX, USA

*Contact Information for References is Available on Request.

TECHNICAL SKILLS – Programming Languages: C++, MATLAB, FORTRAN, PERL, PYTHON
– Modeling: Nuclear Reactor Transients, 2D Fluid Flows, Uncertainty Analysis
– Document Processing: L^AT_EX, Microsoft Word & Excel
– Nuclear Codes: APOLLO3, SCALE, MCNP
– Nuclear Experimentation: Neutron Activation Analysis, Gamma Spectroscopy, Instrument Calibration, Reactor Operation, Radioactive Material Packaging, Robotic Arm Manipulation, Environmental Surveying

- MISCELLANEOUS
- Studied French in Paris, France at the Sorbonne University for one month (JUN2010)
 - Eagle Scout rank earned (APR2006)
 - **Languages:** English (Native), French (Proficient)
 - **Countries Visited:** Australia, Austria, Belgium, Czech Republic, France, Germany, Greece, Italy, Monaco, U.A.E.