College of Engineering Biographical Data

University of Illinois at Urbana-Champaign

Department (% appnt): Nuclear, Plasma, and Radiological Engineering **Date:** September 2016

1. Name: Sullivan, Clair Julia **Birth Date:** 9/13/1975 **Citizenship:** US

2. Present Academic Rank: Assistant **3. Tenure Status:** P

4. Administrative Title:

5. Degrees *(field, institution, year awarded)*

1. BS, Astronomy, University of Michigan, 1997
2. BS, Physics, University of Michigan, 1997
3. MS, Nuclear Engineering, University of Michigan, 1998
4. PhD, Nuclear Engineering, University of Michigan, 2002

6. Academic Positions at U of I and elsewhere *(rank, institution, field, inclusive dates) (show % if you hold multiple appointments)*

1. Assistant Professor, University of Illinois, Nuclear, Plasma and Radiological Engineering, Nuclear Engineering, 2012 - present
2. Faculty Affiliate, University of Illinois, Department of Computer Science and Engineering, 2014 - present
3. Faculty Affiliate, University of Illinois, Department of Informatics, 2015 - present
4. Faculty Affiliate, University of Illinois, National Center for Supercomputing Applications, 2016 - present

7. Professional Activities

a. Other Professional Employment *(title, organization, location, inclusive dates)*

1. Scientist IV /Technical Staff Member (N-2: Advanced Nuclear Technology), Los Alamos National Laboratory, Los Alamos, NM, 2002-2009
2. Senior Project Leader (Defense and Intelligence Program Office), Los Alamos National Laboratory, Los Alamos, NM, 2007-2009
3. Technical Intelligence Officer, Central Intelligence Agency, Washington, DC, 2009-2012

b. Major Consulting Activities *(past five years) (list organization and location)*

1. Guest Scientist, Los Alamos National Laboratory, 2013-present
2. Founder and Chief Executive Officer, La Neige Analytics, 2015 - present

c. Professional Registrations *(field, location, date)*

1.

8. Honors, Recognition, and Outstanding Achievements *(list year)*

Award Name	Citation	Date Awarded

DARPA Young Faculty Award	Defense Advanced Research Projects Agency	2014
Mary Jane Oestmann Professional Women's Achievement Award	American Nuclear Society (National Award)	2015

a. Teaching

Award Name	Citation	Date Awarded
Excellence in Undergraduate Teaching	American Nuclear Society Student Chapter	2013
Collins Fellow	Academy of Excellence in Engineering Education (AE3)	2013
List of Teachers Ranked as Excellent by their Students	University of Illinois at Urbana-Champaign	Spring, 2013
List of Teachers Ranked as Excellent by their Students	University of Illinois at Urbana-Champaign	Fall, 2013
List of Teachers Ranked as Excellent by their Students	University of Illinois at Urbana-Champaign	Spring, 2014
List of Teachers Ranked as Excellent by their Students	University of Illinois at Urbana-Champaign	Fall, 2014
Engineering Council Award for Excellence in Advising	University of Illinois at Urbana-Champaign	2015
Excellence in Undergraduate Teaching	American Nuclear Society Student Chapter, University of Illinois at Urbana-Champaign	2015
List of Teachers Ranked as Excellent by their Students (awarded for two courses: NPRE 451 and NPRE 498)	University of Illinois at Urbana-Champaign	Spring, 2015
List of Teachers Ranked as Outstanding by their Students (awarded to top 10% of all instructors)	University of Illinois at Urbana-Champaign	Fall, 2015

b. Research

Award Name	Citation	Date Awarded
Graduate Student of the Year	University of Michigan, Department of Nuclear Engineering and Radiological Sciences	2002
Distinguished Performance Award	Los Alamos National Laboratory	2004
Exceptional Performance Award	Central Intelligence Agency	2010
Finalist for ICy Award (Annual Media Award)	Central Intelligence Agency	2013

c. Public Service

d. Others

Award Name	Citation	Date Awarded
Best Paper (Undergraduate Student, Radiation Detection)	American Nuclear Society Student Conference, awarded to students supervised by Prof. Sullivan	2013

9. Web pages

Full website URL	Text for link
rdii.npre.illinois.edu	Radiation Detection and Isotope Identification Group

FACTUAL INFORMATION

A. Resident Instruction and Continuing Education *(attach Teaching Activity reports, which covers 10 years)*

1. Resident Instruction *(verify the information on the appended page for sections in which you had primary responsibility; pencil in corrections)*

1. Fall, 2012: NPRE 451 (NPRE Laboratory)
2. Spring, 2013: NPRE 451 (NPRE Laboratory)
3. Fall, 2013: NPRE 451 (NPRE Laboratory)
4. Spring, 2014: NPRE 451 (NPRE Laboratory)
5. Fall, 2014: NPRE 451 (NPRE Laboratory)
6. Spring, 2015: NPRE 451 (NPRE Laboratory)
7. Spring, 2015: NPRE 498 (Advanced Radiation Detection Concepts)
8. Fall, 2015: NPRE 451 (NPRE Laboratory)
9. Spring, 2016: NPRE 451 (NPRE Laboratory)
10. Fall, 2016: NPRE 498 (Advanced Radiation Detection Concepts)
11. Fall, 2016: NPRE 598 (Advanced Radiation Detection Concepts)

2. Continuing Education *(credit courses only) (year, course, # of students, delivery method)*

3. Other Instructional Activities *(prelim and final exams, course development, short courses, etc.)*

1. Spring, 2013: Guest Lecturer, NPRE 458 (Design in NPRE, provided lecture titled "Elements of Radioprotection Design")
2. Fall, 2013: Guest Lecturer, Law 699 (Independent Study, provided lecture titled "Legal Implications of Nuclear Energy")
3. Spring, 2014: Guest Lecturer, Law 792 (Current Legal Problems: Ethics, Economics, and the Environment, provided lecture on "Ethical Implications of Nuclear Energy")
4. Spring, 2014: Guest Lecturer, NPRE 458 (Design in NPRE, provided lecture titled "Elements of Radioprotection Design")
5. Spring, 2015: Guest Lecturer, NPRE 458 (Design in NPRE, provided lecture titled "Elements of Radioprotection Design")
6. Spring, 2016: Guest Lecturer, NPRE 458 (Design in NPRE, provided lecture titled "Elements of Radioprotection Design")

a. Prelim and Final Exams

Doctoral Candidate	Prelim Exam Date	Final Exam Date	(Co-)Chair	(Co-)Director
Soonwook Jung	February 19, 2013	June 6, 2014	David Ruzic	
Liang Cai	March 1, 2013	August 15, 2013	Ling-Jian Meng	
Yi Liu	January 20, 2016	April 28, 2017	Clair Sullivan	
Jacob Stinnett	January 21, 2016	October 7, 2016	Clair Sullivan	
Xiaochun Lai	February 9, 2015	August 15, 2016	Ling-Jian Meng	

b. Course Development

1. NPRE 498: Advanced Radiation Detection Concepts
2. NPRE 444: Nuclear Analytical Methods Lab
3. NPRE 598: Advanced Radiation Detection Concepts

c. Short Courses

4. Undergraduate Advising

a. Academic Advising *(number of students, current year only)*

1. 20

b. Student Organizations *(list past five years)*

1. Faculty Advisor, American Nuclear Society, Student Chapter, 2013 - 2016
2. Faculty Advisor, Be the Match, 2014 - present
3. Faculty Advisor, Women in Nuclear, Student Chapter, 2015 - present
4. Faculty Advisor, The Hacker Within, UIUC Chapter, 2015 - present

c. Design Teams *(past five years)*

1. 2013: Radiation Detector Sensor Networks using Social Media
2. 2014: Visual Interface for Radiation Detection (ViRAD)
3. 2015: Radiation Detection using the Raspberry Pi Architecture
4. 2016: New Methods for Generating He-3 for Neutron Detectors

d. Other *(individual projects, engineering open house, etc. past five years)*

B. Research, Creative, and Other Scholarly Activities

1. Publications

List publications in print or accepted, with authors' names ordered the way they appear on the publications. Provide inclusive page numbers for papers in proceedings and journals. Follow the outline given below for the organization of the list of publications. Within each category place items in chronological order.

(*) has undergone stringent editorial review by peers
(**) invited and carries with it prestige and recognition
(s) based on work as a student
(w) co-authored with students you supervise
(!) represents most important contribution of the past decade
(P) derived from PhD thesis
(D) co-authored with post-docs

a. Books Authored or Co-Authored

1. Original Editions

1. (**)(!) W.H. Casson, C.J. Sullivan, J.M Blackadar, R.P. Paternoster, J.L. Matzke, M. Rawool-Sullivan, *Nuclear Reachback Reference Manual,* Department of Homeland Security, LA-UR-06-0504, 2006.
2. (**) C.J. Sullivan, *Modern Methods of Gamma-Ray Spectroscopy and Isotope Identification*. IOP Publishing, Bristol, UK. *In preparation.*

2. Revisions

b. Books Edited or Co-Edited

1. Original Editions

2. Revisions

c. Chapters in Books

1. (**) C.J. Sullivan, "Basic Nuclear Physics," in W.H. Casson, C.J. Sullivan, J.M. Blackadar, R.P. Paternoster, J.L. Matzke, M. Rawool-Sullivan, *Nuclear Reachback Reference Manual,* Department of Homeland Security, LA-UR-06-0504, 2006.
2. (**) C.J. Sullivan, "Isotope Identification Algorithms," in W.H. Casson, C.J. Sullivan, J.M. Blackadar, R.P. Paternoster, J.L. Matzke, M. Rawool-Sullivan, *Nuclear Reachback Reference Manual,* Department of Homeland Security, LA-UR-06-0504, 2006.
3. (**) C.J. Sullivan, "Radiation Detection and Measurement," in M. Kutz (ed.), *Handbook of Measurement in Science and Engineering, Volume 3*, John Wiley & Sons, Inc., Hoboken, NJ. 2016.
4. (*)(**)(!)(D) M-H Jeong, C.J. Sullivan, S. Wang, "Analysis of Dynamic Radiation Level Changes Using Surface Networks," in H. Onsrud and W. Kuhn (ed.), *Advancing Geographic Information Science: The Past and Next Twenty Years.* GDSI Association Press. Needham, MA. 2016.

d. Monographs *(longer than an article, but shorter than a book)*

e. Articles

1. Articles In Journals

1. (*)(S) C.J. Branch (nee), J.D. Sanders, K.J. Kearfott, B. Stojadinovic, D.K. Wehe, "An augmented reality radiation display systems (ARRDS) for radiation protection applications," *Transactions of the American Nuclear Society*, 81 (1999) 247.
2. (*)(S) C.J. Branch (nee) and K.J. Kearfott, "Positional glow curve simulation for thermoluminescent detector (TLD) system design," *Nuclear Instruments and Methods in Physics Research A*, 422 (1999) 638-642.
3. (*)(S)(P) C.J. Sullivan, Z. He, G.F. Knoll, G. Tepper, D.K. Wehe, "A high pressure xenon gamma-ray spectrometer using a coplanar anode configuration," *Nuclear Instruments and Methods in Physics Research A*, 505 (2003) 238-241.
4. (*)(W) C.J. Sullivan, M.E. Martinez, S.E. Garner, Wavelet analysis of sodium iodide spectra, *IEEE Transactions on Nuclear Science*, 53 (5) (2006) 2916-2922.
5. (*)(W) Y. Feng, J.E. Baciak, C. Sullivan, G. Gardner, "A pixilated design of high pressure xenon gamma-ray spectrometer," *Nuclear Instruments and Methods in Physics Research A*, 579 (2007) 54-57.
6. (*) C.J. Sullivan, S.E. Garner, K.B. Blagoev, D.L. Weiss, "Generation of customized wavelets for the analysis of gamma-ray spectra," *Nuclear Instruments and Methods in Physics Research A*, 579 (2007) 275-278.
7. (*)(W)(!) C.J. Sullivan and J. Stinnett, "Validation of a Bayesian-based isotope identification algorithm," *Nuclear Instruments and Methods in Physics Research A*, 784 (2014) 298-305.
8. (*)(W)(!) Z. Liu and C.J. Sullivan, "Mobile Radiation Sensor Networks for Source Detection in a Fluctuating Background Using Geo-tagged Count Rate Data," *IEEE Transactions on Nuclear Science,* accepted for publication, in revision.
9. (*)(W) J. Stinnett, M.M. Watson, C.J. Sullivan, H. Xiong, "Feature Extraction and Isotope Identification on NaI Gamma-Ray Spectra," *IEEE Transactions on Nuclear Science*, accepted for publication, in revision.
10. (*)(W) J. Zhao and C.J. Sullivan, "Spectral Analysis from Radiation Sensor Networks using Principal Component Analysis," *IEEE Transactions on Nuclear Science,* accepted for publication, in revision.
11. (*)(W)(!) M. Kamuda and C.J. Sullivan, "Automated Isotope Identification Algorithm Using Artificial Neural Networks," *IEEE Transactions on Nuclear Science,* accepted for publication, in revision.
12. (*)(W) Y. Liu, C.J. Sullivan, and F. d'Errico, "Machine Learning Method Applied in Readout System of Superheated Droplet Detector," *IEEE Transactions on Nuclear Science,* accepted for publication, in revision.
13. (*)(D) M-H Jeong, C.J. Sullivan, and S. Wang, "Urban search of radioactive materials enhanced by mobile sensor networks and geospatial methods," *IEEE Transactions on Nuclear Science*, accepted for publication, in revision.

14. (*)(**) C.J. Sullivan, "Radiation hotspot detection with sensor networks enabled by geospatial techniques," *CyberGIS'16*, INVITED PAPER, in revision.
15. (*)(D) M.H. Jeong, Y. Cai, C.J. Sullivan, S. Wang, "Data depth based clustering analysis," *Proceedings of the 24th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems,* (29) 1-10, 2016. (doi: 10.1145/2996913.2996984)

2. Articles In Conference Proceedings

1. J.M. Blackadar, J.A. Bounds, P.A. Hypes, D.J. Mercer, C.J. Sullivan, "Evaluation of handheld isotope identifiers," *Proceedings of the INMM Southwest Section Meeting*, (2003) LA-UR-03-2742.
2. J.M. Blackadar, C.J. Sullivan, B.G. Rees, S. Garner, D.J. Mercer, "Continuing evaluation of isotopic identifiers," *Proceedings of the 45th Annual INMM Meeting*, (2004) LA-UR-03-2742.
3. C.J. Sullivan, S.E. Garner, K.B. Butterfield, "Wavelet analysis of gamma-ray spectra," *IEEE Nuclear Science Symposium Conference Record*, 1 (2004) 281-286.
4. S.L. Seitz, J.M. Blackadar, S.K. Almecci, M.A. Nelson, G.H. Gardner, M. Rawool-Sullivan, B.G. Rees, J.A. Bounds, W.H. Casson, S.E. Garner, C.J. Sullivan, "Radiation detection evaluation: RadAssessor characterizes integrated findings," *IEEE Nuclear Science Symposium Conference Record*, 1 (2005) 288-291.
5. (W) C.J. Sullivan, M.E. Martinez, S.E. Garner, "Wavelet analysis of sodium iodide spectra," *IEEE Nuclear Science Symposium Conference Record*, 1 (2005) 302-306.
6. (W) Y. Feng, J.E. Baciak, C.J. Sullivan, G.H. Gardner, "Pixelated designs of high pressure xenon gamma-ray spectrometer and position sensing," *Proceedings of the SPIE*, 6319 (2006).
7. (W) C.J. Sullivan, S.E. Garner, M. Lombardi, K.B. Butterfield, "Evaluation of key detector parameters for isotope identification," *IEEE Nuclear Science Symposium Conference Record*, 2 (2007) 1181-1184.
8. C.J. Sullivan, A. Burger, M. Groza, T.H. Prettyman, "Bulk uniformity of cadmium zinc telluride (CZT) crystals for large volume coplanar gamma spectrometers," *IEEE Nuclear Science Symposium Conference Record*, 3 (2007) 1805-1808.
9. S.A. Awadalla, H. Chen, J. Mackenzi, P. Lu, K. Iniewski, P. Marthandam, R. Redden, G. Bindley, Z. He, F. Zhang, M. Groza, A. Burger, D.R. Mayo, C.J. Sullivan, Thickness scalability of large volume cadmium zinc telluride high resolution radiation detectors, *IEEE Nuclear Science Symposium Conference Record*, 1 (2008) 58-62.
10. (W) K. Weichman, K. Schoemaker, B. Russell, J. Rehal, C.J. Sullivan, "SEE RADS platform: social, every day, and emergency radiation detection system," *American Nuclear Society Student Conference Record,* (2013)
11. (W) J. Stinnett, C.J. Sullivan, "An Automated Isotope Identification Algorithm Using Bayesian Statistics," *IEEE Nuclear Science Symposium Conference Record*, (2013).
12. (W) C.J. Sullivan, J. Lu, "Automated Photopeak Detection and Analysis in Low Resolution Gamma-Ray Spectra for Isotope Identification," *IEEE Nuclear Science Symposium Conference Record,* (2013).
13. C.J. Sullivan, "Nuclear Forensics Driven by Geographic Information Systems and Big Data Analytics," *Conference Proceedings of the Institute for Nuclear Materials Management on Information Analysis Technologies, Techniques and Methods for Safeguards, Nonproliferation and Arms Control Verification Workshop*, (2014) 273-286.
14. (W) J.B. Stinnett, C.J. Sullivan, "Automated Isotope Identification of Single-Source and Mixed-Sources," *IEEE Nuclear Science Symposium Conference Record*, (2014).
15. S.A. Pozzi, S.D. Clarke, D.K. Wehe, Z. He, K. Kearfott, J.C. Lee, A. Hero, M. Flaska, A. DiFulvio, R. Lanza, S. Kemp, J. Fischer, A. Danagoulian, A. Glaser, F. von Hippel, P. Richards, J.K. Mattingly, M. Garces, I. Jovanovic, L. Carin, P. Wilson, J. Baciak, A. Enqvist, A. Farsoni, F. d'Errico, C.J. Sullivan, "Consortium for Verification Technology Research Activities," *Proceedings of the Institute for Nuclear Materials Management*, (2015).
16. (D) M-H Jeong, C.J. Sullivan, S. Wang, "Complex radiation sensor network analysis with big data analytics," *IEEE Nuclear Science Symposium Conference Record,* (2015).

17. (W) Y. Liu, C.J. Sullivan, F. d'Errico, "Superheated Droplets Detector for Thermal Neutron Detection," *IEEE Nuclear Science Symposium Conference Record,* (2015).
18. (W) J. Stinnett, C.J. Sullivan "Automated Isotope Identification with Bayesian Classifiers," *IEEE Nuclear Science Symposium Conference Record,* (2015).
19. (D) M.-H. Jeong, S. Wang, and C. J. Sullivan. Density maps based on data. In *Proceedings of the 3rd International Conference on CyberGIS and Geospatial Data Science*, 2016.
20. (D) M-H Jeong, C.J. Sullivan, M. Cheng, S. Wang, "Minimization of the impact of sensor velocity on the probability of source detection using geographically weighted methods," *IEEE Nuclear Science Symposium.* Accepted for presentation. 2016.
21. (W) Y. Liu, C.J. Sullivan, F. d'Errico, "Thermal neutron detection with superheated droplet detector and real-time readout system," *IEEE Nuclear Science Symposium Conference Record,* 2016.
22. (W) M. Kamuda, J. Stinnett, C.J. Sullivan, "Peak quantification with neural networks for low-resolution NaI spectra," *IEEE Nuclear Science Symposium Conference Record,* 2016.
23. (W) J. Zhao, K.A. Roth, C.J. Sullivan, "Simulation and implementation of mobile sensor networks for radiation detection," *IEEE Nuclear Science Symposium Conference Record,* 2016.
24. (W) Z. Liu and C.J. Sullivan, "Urban source detection with mobile sensor networks enhanced with machine learning algorithms," *IEEE Nuclear Science Symposium Conference Record,* 2016.
25. (D) M-H Jeong, J. Yin, C.J. Sullivan, and S. Wang, "Robust statistical approaches to enhance spatial autocorrelation," *Proceedings of GIScience 2016.* Accepted for publication. 2016.
26. (*)(**) C.J. Sullivan, "Radioactive Source Localization in Urban Environments with Sensor Networks and the Internet of Things," *IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems*, 2016.
27. (W) J. Mattingly, J. Hutchinson, C. Sullivan, J. Stinnett, M. Kamuda, M. Alamaniotis, B. Simms, J. Mueller, J. Newby, J. Linkous, S. Pozzi, K. Polack, M. Hamel, Z. He, D. Goodman, M. Streicher, "CNEC and CVT Subcritical Experiments with Category I Special Nuclear Material at the Nevada National Security Site Device Assembly Facility," *Proceedings for the Institute of Nuclear Materials Management,* (2016).

f. Pending Publications

1. (*)(D) C.J. Sullivan, M.H. Jeong, S. Wang, "Application of Geographic Information System Techniques to the Analysis of Radiation Sensor Networks," *In preparation.*
2. (W) J. Stinnett, C.J. Sullivan, "A Bayesian-Based Algorithm for the Analysis of Low-Resolution Gamma-Ray Spectra," *In preparation.*

g. Invited Lectures

Title	Conference	Location	Year	URL
Instrumentation for Homeland Defense	Seminar	University of Florida	2005	
Techniques of Isotope Identification: Gamma-Ray Spectroscopy in the Real World	JOWOG-29	Department of Energy	2006	
Rapid Response Spectral Analysis	Workshop	International Atomic Energy Agency, Vienna, Austria	2006	
Wavelet Analysis of Gamma-Ray Spectra	Seminar	North Carolina State University	2012	
Wavelet Analysis of Gamma-Ray Spectra	Seminar	Massachusetts Institute of Technology	2012	
Wavelet Analysis of Gamma-Ray Spectra	Seminar	University of Michigan	2012	
Evaluation of Radiation Detectors for Nuclear Emergency Response	Seminar	University of Illinois	2012	

Radiation Detection for Nuclear Emergency Response	Seminar	University of Illinois	2012
Alumni Perspective (Panelist)	Celebrating 25 Years of Undergraduate Research: Diversity, Inclusion, and Impact	University of Michigan	2014
Radiation Detection for Nuclear Emergency Response	Seminar	Kansas State University	2014
Nuclear Forensics Driven by Geographic Information Systems and Big Data Analytics	Seminar	University of Illinois Department of Computer Science and Engineering	2014
Radiation Detection for Nuclear Emergency Response	Seminar	University of Wisconsin	2015
Nuclear Forensics Driven by Geographic Information Systems and Big Data Analytics	Seminar	Los Alamos National Laboratory	2015
Radiation Detection for Nuclear Emergency Response	Seminar	University of Florida	2016
Radiation Sensor Network Measurements Decoded through Data Analytics	Seminar	University of California at Berkeley	2016
Radioactive Source Localization in Urban Environments with Sensor Networks and the Internet of Things	*IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems*	Baden-Baden, Germany	2016
Nuclear Emergency Response using Radiation Sensor Networks and Data Science	Seminar	University of Utah	2016
Radiation Sensor Network Measurements Decoded through Data Analytics	Seminar	University of Illinois, Department of Physics	2017

h. Other Publications *(patents, bulletins or reports, magazine articles, etc.)*

1. Patents

1. (S) C.J. Branch (nee), K.J. Kearfott, D.S. McGregor, Augmented Reality Radiation Display System and In Situ Spectrometry Method for Determining the Depth Distribution of Radionuclides (1999) *U.S. Provisional Patent, Serial No. 60/129,837*, Washington, DC: U.S. Patent and Trademark Office.
2. (S) C.J. Branch-Sullivan, K.J. Kearfott, B. Stojadinovic, D.S. McGregor, Method and System for High-Speed 3D Imaging of Optically-Invisible Radiation (2004) *U.S. Patent No. 6,815,687*, Washington, DC: U.S. Patent and Trademark Office.
3. K.D. Ianakiev, P.B. Littlewood, K.B. Blagoev, M.T. Swinhoe, J.L. Smith, C.J. Sullivan, B.S. Alexandrov, J.C. Lashley, Semiconductor Neutron Detector (2011) *U.S. Patent No. 7,902,517*, Washington, DC: U.S. Patent and Trademark Office.

2. Bulletins

3. Magazine Articles

1. D. Ambrose and C.J. Sullivan, "STEM Leader From the Roeper School: An Interview With Nuclear Engineer Clair J. Sullivan", *Roeper Review*, 38:199 202, 2016.

4. Reports

1. C.J. Branch-Sullivan, R.J. Estep, “Three-dimensional imaging of radiological contamination in soil using the material basis set method,” (2000) LA-UR-00-2163.
2. J.M. Blackadar, C.J. Sullivan, B.G. Rees, “A twelve category approach to evaluating the correctness of isotope identification,” (2004) *LA-UR-04-0192*.
3. C.J. Sullivan, K.D. Ianakiev, “Analysis of vibration-resistant electrode design of gas-based gamma-ray spectrometers for spectroscopic portal monitors,” (2005) *LA-UR-05-4005*.
4. C.J. Sullivan, D.L. Weiss, “Wavelet work for the MIMBS project,” (2006) *LA-UR-06-6834*.
5. C.J. Sullivan, “Low-resolution gamma-ray spectroscopy with wavelet analysis,” (2008) *LA-UR-08-00684*.

2. Grants, contracts and gifts *(in chronological order up to past ten years)*

a. For Research

Years (Inclusive)	Brief Title or Description	Source of Funds	Total Funding	Funds Allocated to this prof	#PI's and lead PI if not this prof
2004-2005	Vibration-Resistant High Pressure Xenon Detectors	Department of Homeland Security	$150,000	$150,000	1
2005-2008	New Materials for Radiation Detection	Los Alamos National Laboratory - Laboratory Directed Research and Development (LDRD) - Directed Research (DR)	$3,100,0000	$225,000	3 PIs, Lead PI: Darryl Smith
2006-2008	Wavelet-Based Isotope Identification Algorithm	Department of Energy, Office of Emergency Response (NA-42)	$500,000	$500,000	1
2006-2008	6 cm^3 CdZnTe Isotope Identifier	Department of Energy, Office of Nonproliferation Verification Research and Development (NA-22)	$600,000	$600,000	1
2013-2018	Isotope Identification of Post-Detonation Debris using Advanced Mathematical Techniques	Defense Threat Reduction Agency	$782,744	**$782,744** (Year 1: $157,359, Year 2: $161,681, Year 3: $168,034, Year 4: $145,875, Year 5: $149,794)	1
2014-2019	Consortium for Verification Technology (CVT), "Radionuclide Information Barriers using Novel Statistical Approaches"	National Nuclear Security Administration (NNSA), Department of Energy	$25,000,000	**$798,288** (Year 1: $160,087, Year 2: $159,637, Year 3: $159,721 , Year 4: $159,833 Year 5: $159,009)	10 PIs, Lead PI: Sara Pozzi (University of Michigan)
2014-2019	Consortium for Nonproliferation Enabling Capabilities (CNEC), "Simulation of	National Nuclear Security Administration (NNSA), Department	$25,000,000	**$1,487,125** (Year 1: $287,125, Year 2: $300,000, Year 3: $300,000, Year	5 PIs, Lead PI: Robin Gardner (North Carolina State

	Data-Enhanced Radiation Sensor Networks"	of Energy		4: $300,000, Year 5: $300,000)	University)
2014-2016	Detection of the Illicit Movement of Nuclear Materials with Big Data	University of Illinois, College of Engineering, Strategic Research Initative	$149,406	**$149,406** (Year 1: $74,841, Year 2: $74,564)	3 PIs, Lead PI: Clair Sullivan
2014-2016	Long-Range Detection of Special Nuclear Materials	Defense Advanced Research Projects Agency (DARPA) Young Faculty Award	$489,662	**$489,662** (Year 1: $244,973, Year 2: $244,689)	1
2017-2020	RadSITE™ Directional RAD/NUC Finder	Department of Homeland Security (DHS), Domestic Nuclear Detection Office (DNDO)	$2,000,000 (PENDING)	**$250,000 (PENDING)**	3 PIs, Lead PI: James Winso (Spectral Labs Inc.)
2017-2020	Development of Radiation Context Awareness Framework for Police Vehicles	Department of Homeland Security (DHS), Domestic Nuclear Detection Office (DNDO)	$2,500,000 (PENDING)	**$240,000 (PENDING)**	4 PIs, Lead PI: Daniel Chivers (Berkeley Applied Analytics)
2017-2020	Transformational Improvements in Vehicle Based Rad/Nuc Monitoring by Data Fusion	Department of Homeland Security (DHS), Domestic Nuclear Detection Office (DNDO)	$1,890,000 (PENDING)	**$290,000 (PENDING)**	5 PIs, Lead PI: Craig Duff (Kromek, Ltd.)
FY15	TOTAL FUNDING AVAILABLE TO PI				$924,385
FY16	TOTAL FUNDING AVAILABLE TO PI				$940,571
FY17	TOTAL FUNDING AVAILABLE TO PI				$627,755
FY18	TOTAL FUNDING AVAILABLE TO PI				$459,833
FY19	TOTAL FUNDING AVAILABLE TO PI				$459,009

b. For Instruction

3. Areas of Research *(brief description, key words are adequate)*

1. Radiation detection and measurements; data science; gamma-ray spectroscopy; automated isotope identification algorithms; nuclear forensics; nuclear security; nuclear nonproliferation; sensor networks; big data; new materials for radiation detection

4. Graduate Thesis Research Advising *(list co-advisor, if any)*

a. M.S. Thesis Students *(name and year granted or anticipated)*

Student Name	Year Graduated	Thesis Title	Placement
Jie Lu	2013	Wavelet Methods for Peak Quantification in Low-Resolution Gamma-Ray Spectra	N/A

Xianliang Kong	2014	Advanced Adaptive Gamma-Ray Libraries for Isotope Identification	Evolution Lab
Jacob Stinnett	2014	The Use of Bayesian Analysis for Automated Isotope Identification	Completed PhD
Hao Xiong	2015	Photopeak Detection and Noise Analysis using Advanced Mathematical Techniques	Delvv, Inc.
Zheng Liu	2016	Mobile Radiation Sensor Networks for Source Detection in a Fluctuating Background using Geo-tagged Count Rate Data	Continuing for PhD
Jifu Zhao	2016	Graph Theoretic Approaches for the Measurement of Radiation Background and Sources	Continuing for PhD
Mark Kamuda	expected May, 2017	Post-Detonation Debris Analysis with Advanced Spectroscopic Techniques	N/A
Michael Cheng	expected May, 2017	Anomalous Radioactive Source Localizaton Enabled through Cloud Computing and Sensor Networks	N/A
Christian Zircher	expected May, 2017	Radiation Sensor Network within a Virtual Environment	N/A
Karl Roth	expected December, 2017	Detection of Radioactive Sources using Geospatially-Enhanced Radiation Sensor Networks	N/A

b. Ph.D. Thesis Students *(name and year granted or anticipated)*

Student Name	Year Graduated	Thesis Title	Placement
Jacob Stinnett	October 7, 2016	The Use of Bayesian Analysis for Automated Isotope Identification	Los Alamos National Laboratory
Yi Liu	expected 2017	Superheated Liquid Emulsion Drop Devices for the Discrimination of Fast and Thermal Neutrons	Facebook
Zheng Liu	expected 2018	Mobile Radiation Sensor Networks for Source Detection in a Fluctuating Background using Geo-Tagged Count Rate Data	
Jifu Zhao	expected 2019	Sensor Network Fusion Techniques for Mobile Radiation Detectors	
Sheng Yang	expected 2020	TBD	

5. Editorships of Journals or Other Learned Publications *(list year)*

1. Associate Editor, IEEE Transactions on Nuclear Science: 2006-2008
2. Associate Editor, Journal of Intelligence Community Research and Development (CLASSIFIED PUBLICATION): 2010-2012
3. Associate Editor, IEEE Transactions on Nuclear Sciences: 2012-2015

6. Post-doctoral Associates and Visiting Scientists *(>3 months stay in the past three years) (list name, year(s), country of origin, permanent employer)*

Name	Title (percent time)	Country of Origin	Permanent Employer	Years
Andrea Mattera	Visiting graduate student	Italy	University of Pisa	2015
Myeong Hun Jeong	Postdoctoral Research Assistant (50%)	Korea	Chosun University, Korea (tenure track)	2015-2017
Zhe Zhang	Postdoctoral Research Assistant	China	TBD	2017-present

7. Other Scholarly Activities in the past five years *(conferences organized or chaired, unpublished presentations, etc.)*

a. Conferences Organized or Chaired

1. Organizing Committee, *IEEE Nuclear Science Symposium and Medical Imaging Conference*, Strasbourg, France, 2016
2. Topic Area Convener, Homeland and National Security Instrumentation, *IEEE Nuclear Science Symposium*, 2015.
3. Workshop Chair, Symposium on Radiation Measurements and Applications (SORMA) Radiation + Data Science Workshop, Berkeley, CA, 2016.
4. General Chair, *Industrial Radiation and Radioisotope Measurement Applications-10*, Chicago, IL, 2017
5. Topic Area Convener, Data Science, *IEEE Nuclear Science Symposium*, 2017.

b. Unpublished Presentations

c. Other Scholarly Activities

1. Technical Reviewer, *Symposium on Radiation Measurements and Applications (SORMA) XV*, 2014
2. Session Chair, *Symposium on Radiation Measurements and Applications (SORMA) XV,* 2014
3. Session Chair, *IEEE Nuclear Science Symposium,* 2014
4. Session Chair, *IEEE Nuclear Science Symposium*, 2015
5. Technical Reviewer, *Symposium on Radiation Measurements and Applications (SORMA) XVI*, 2016
6. Session Chair, *Symposium on Radiation Measurements and Applications (SORMA) XVI*, 2016

C. Service

1. Professional Societies *(list membership; office held, with dates; major committees or boards)*

1. Member, American Nuclear Society, 1997 - 2002, 2015 - present
2. Member, Association for Computing Machinery, 1997 - 1999
3. Member, Health Physics Society, 1997 - 1999
4. Member, Institute of Electrical and Electronics Engineers (IEEE), 2000 - present
5. Reviewer, *Nuclear Instruments and Methods in Physics Research A,* 2000 - present
6. Reviewer, *IEEE Transactions on Nuclear Science,* 2000-2006
7. Reviewer, ANSI/IEEE Standard N42.34-2003, “Performance Criteria for Hand-Held Instruments for the Detection and Identification of Radionuclides,” 2002-2003
8. Reviewer, ANSI/IEEE Standard N42.32-2002, “American National Standard Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security," 2002-2003
9. Reviewer, *Journal of Intelligence Community Research and Development (CLASSIFIED PUBLICATION),* 2005-2008

2. University *(department, college and campus committees, administration, etc. for past five years)*

a. Department

1. Member, Department of Nuclear, Plasma, and Radiological Engineering Search Committee, 2012-2013
2. Member, Department of Nuclear, Plasma, and Radiological Engineering Qualifying Exam Committee, 2013-2014
3. Member, Department of Nuclear, Plasma, and Radiological Engineering Search Committee, 2013-2014
4. Member, Department of Nuclear, Plasma, and Radiological Engineering Search Committee, 2014-2015
5. Member, Department of Computational Science and Engineering Annual Meeting Committee, 2014-2015
6. Member, Department of Nuclear, Plasma, and Radiological Engineering Undergraduate Education Committee, 2015-2016

7. Member, Department of Nuclear, Plasma, and Radiological Engineering Search Committee, 2015-2016

b. College

1. Member, College of Engineering Teaching Evaluation and Improvement Committee, 2013-2014
2. Member, College of Engineering Big Data Graduate Curriculum Committee, 2014-2015
3. Member, College of Engineering Teaching Evaluation and Improvement Committee, 2014-2015
4. Member, College of Engineering Committee for M.Eng. in Big Data, 2015-2016

c. Campus

1. Member, Applied Research Institute (ARI) Search Committee, 2012-2013
2. Steering Committee Member, Illinois Data Science Initiative, 2016 - present.

3. Federal and State *(government commissions or panels, community, industrial extension, etc.)*

1. Independent Review Panel Member, Department of Energy, Office of Nonproliferation Research and Development (NA-22), 2013
2. Proposal Review Panelist, National Science Foundation, 2013
3. Independent Review Panel Member, Department of Energy, Office of Nonproliferation Research and Development (NA-22), 2016

4. Other Outside Service

D. Improvement Activities *(list any specific programs in which you have participated it improve teaching and professional competence)*

1. National Science Foundation Grant Writing Workshop, University of Illinois at Chicago, 2012
2. FastStart Program, Academy for Excellence in Engineering Education, University of Illinois at Urbana-Champaign, 2012 - 2013
3. Career Development Workshop, Academy for Excellence in Engineering Education, University of Illinois at Urbana-Champaign, 2013
4. Course (Re)Design, Academy for Excellence in Engineering Education, University of Illinois at Urbana-Champaign, 2013
5. The Flipped Classroom, Academy for Excellence in Engineering Education, University of Illinois at Urbana-Champaign, 2013
6. Big Data Workshop, Department of Computer Science and Engineering, University of Illinois at Urbana-Champaign, 2014
7. Scholar, The Data Incubator, Washington, DC, 2015

E. Professional Highlights