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CASEY A. ANDERSON

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Work Information

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PROFESSIONAL EXPERIENCE

Los Alamos National Laboratory *Los Alamos, New Mexico*

2016 - Present	Graduate Research Assistant	<i>NEN-5, Systems Design & Analysis</i>
2016 - Present	Graduate Research Assistant	<i>ISR-1, Space Science & Applications</i>
2011 - 2012	Post Master's Research Assistant	<i>W-13, Advanced Engineering Analysis</i>
2010	Summer Intern	<i>XCP-3, Monte Carlo Codes</i>

- Implemented new features in MCNP6 through writing code, developing benchmarks, publishing reports, and presenting the features at various conferences [Pubs: [2,3,4,5,6,7](#)].
- Gained significant knowledge and experience in the design, modeling, simulation, and analysis of a variety of radiation detectors for the Nuclear Detection Figure of Merit (NDFOM) project.
- Transitioned NDFOM from version 2.0 to 3.0 by modularizing and refactoring the backend Python code and through developing a cleaner, more intuitive user interface for the customer.
- Utilized version control methods with Git, Mercurial, and SVN for collaboration on software projects
- Assisted in the development, testing, validation, and verification of the combined radiation transport and finite-element analysis multi-physics capability for the Engineering Campaign-7 Nuclear Survivability project [Pubs: [11,12](#)].
- Developed unstructured mesh human phantoms for health physics applications with MCNP6 [Pubs: [13,14](#)].
- Created a software visualization package for finite element geometries in MCNP simulations.
- Utilized high performance computing (HPC) systems and utilities for advanced physics simulations and analysis.

Medical College of Wisconsin *Milwaukee, Wisconsin*

2012 - 2016	Graduate Research Assistant	<i>Department of Biophysics</i>
2014 - 2016	Biophysics Representative, IT Liaison	<i>Graduate Student Council</i>

- Conducted background research, provided preliminary results, and assisted in the writing of an R21 National Institute of Health (NIH) research grant to help fund my graduate research.
- Patented a segmented reconstruction technique for artifact reduction in Magnetic Resonance Imaging [Pat: [i](#)].
- Collaborated with a diverse group of professionals, including medical doctors and imaging technologists, to perform clinical research, meet deliverables, and submit the findings to various international conferences [Pubs: [8,9,10](#)].
- Gained hands-on technical and experimental research skills by working in a laboratory and acquiring data while performing research on animals.
- Facilitated communication between students, staff, and the university's Information Technology (IT) team as the graduate school IT liaison.

University of Wisconsin - Madison *Madison, Wisconsin*

2008 - 2011	Student Research Assistant	<i>Department of Medical Physics</i>
2010 - 2011	Chapter President	<i>American Nuclear Society (ANS)</i>

- Researched methods for non-invasive quality assurance assessment of radioactive brachytherapy seeds.
- Managed the American Nuclear Society organizational duties, including activities such as recruiting guest speakers to present at meetings, organizing conference travel, and arranging public outreach events.
- Mentored and taught a variety of students through volunteering at various events, such as Science Olympiad, middle and high school science fairs, and local Boy Scout chapters on achieving their Nuclear Science Merit Badge.

TECHNICAL & PROFESSIONAL SKILLS

Physics/Engineering

- Nuclear Engineering
- Computational Physics
- Monte Carlo Methods
- Modeling and Simulation
- Fourier Analysis
- Magnetic Resonance Imaging
- Statistical Analysis
- Signal and Image Processing
- High Performance Computing
- Hand Calculations
- Radiation Detectors
- Multi-physics coupling
- Radioactive Material Handling
- Regularization Methods
- Computer Aided Engineering
- Computer Aided Design
- Finite Element Analysis

Software

- MCNP
- Abaqus/CAE
- Linux
- Matplotlib
- Microsoft Office
- Matlab
- MacOS
- Eclipse IDE
- Django
- PostgreSQL
- Windows
- Gnuplot
- Cmake
- GADRAS
- RELAP
- R

Programming

- Python
- Bash
- L^AT_EX
- Git
- Mercurial
- Version Control
- Unit Testing
- Scripting
- Object Oriented
- C/C++
- Fortran
- Debugging
- HTML
- Javascript
- Java
- Android

Other Skills

- Technical Writing
- Presentations
- Group Collaboration
- Independent Work
- File Input/Output
- Mentoring
- Data Collection
- Data Analytics
- Data Visualization
- Validation & Verification
- SQL Databases
- XML/JSON File Format
- Working with Patients
- DICOM Image Analysis
- Server Management
- Animal Experimentation

Key (Experience Level)

● Expert ● Intermediate ○ Novice

AWARDS & HONORS

August, 2017	SPOT Award	<i>Los Alamos National Laboratory</i>
May, 2016	Magna Cum Laude	<i>Abstract, ISMRM Proceedings</i>
May, 2014	Silver Medal	<i>Student Poster Presentation, ISMRM Conference</i>
2009, 2010	Exelon Scholarship	<i>University of Wisconsin - Madison</i>

AFFILIATIONS

2008-2012, 2016-Present	American Nuclear Society (ANS)
2012 - 2016	International Society of Magnetic Resonance in Medicine (ISMRM)

EDUCATION

Primary Education

April, 2016	M. Sc, Biophysics[†]	<i>Medical College of Wisconsin</i>
May, 2011	M. Sc, Nuclear Engineering & Engineering Physics	<i>University of Wisconsin - Madison</i>
May, 2011	B. Sc, Nuclear Engineering	<i>University of Wisconsin - Madison</i>

[†]Thesis: "Quantitative Susceptibility Mapping: Exploratory Development and Initiation of Processing Pipelines"

Additional Classes & Trainings

May, 2016	MCNP6 Intermediate Workshop	<i>Los Alamos New Mexico</i>
May, 2015	CPR Certification Training	<i>Milwaukee, Wisconsin</i>
October, 2014	General Electric MR Programming Workshop	<i>Madison, Wisconsin</i>
August, 2011	Dale Carnegie Training	<i>Los Alamos, New Mexico</i>
June 2011	Introduction to Abaqus	<i>Minneapolis, Minnesota</i>
July, 2011	Introduction to Python Programming	<i>Los Alamos, New Mexico</i>
May, 2010	MCNP5 Beginner Workshop	<i>Los Alamos, New Mexico</i>

PUBLICATIONS & PRESENTATIONS

1. Editors. "MCNP6.2 User's Manual". In: *LANL report* (2017)
2. Casey Anderson and Gregg McKinney. "MCNP6 Built-in High Level Detector Responses". In: *2017 IEEE Nuclear Science Symposium and Medical Imaging Conference*. (Atlanta, Georgia). Oct. 2017,
3. ‡ Casey Anderson et al. "Neutron and Gamma Correlations using CGM in MCNP 6.2.0 (LA-UR-20353)". In: *Proceedings of the 27th American Nuclear Society Summer Meeting*. (San Fransisco, California). 2017
4. § James Tutt and Gregg McKinney. "Speed and Memory Improvements to MCNP6 Delayed-Gamma Line Treatment (LA-UR-21050)". In: *Proceedings of the 27th American Nuclear Society Summer Meeting*. (San Fransisco, California). 2017
5. ‡ Casey Anderson et al. "Delta-ray production in MCNP6.2.0 (LA-UR-16-25402)". In: *24th Conference on Applications of Accelerators in Research and Industry*. (Forth Worth, Texas). Nov. 2016
6. ‡ James Tutt, Casey Anderson, and Gregg McKinney. "Background-Source Cosmic-Photon Elevation Scaling and Cosmic-Neutron/Photon Date Scaling in MCNP6 (LA-UR-16-24928)". In: *24th Conference on Applications of Accelerators in Research and Industry*. (Forth Worth, Texas). Nov. 2016
7. James Tutt, Casey Anderson, and Gregg McKinney. "Delayed-Gamma Energy Biasing with Exact Energy Sampling in MCNP6.2.0 (LA-UR-16-24057)". In: *Proceedings of the 26th American Nuclear Society Winter Meeting*. (Las Vegas, Nevada). Oct. 2016
8. || Casey Anderson et al. "Volume-Paracellated Quantitative Susceptibility Mapping". In: *Proceedings of the International Society of Magnetic Resonance in Medicine 24th Conference*. (Singapore, Singapore). May 2016
9. † Casey Anderson and Kevin Koch. "Volume-parcellated Quantitative Susceptibility Mapping of the Human Brain at 7T". in: *2015 Minnesota Workshop on High and Ultra-High Field Imaging*. (Minneapolis, Minnesota). Oct. 2015
10. Casey Anderson, Kimberley Pechman, and Kathleen Schmainda. "Quantitative Susceptibility Mapping to Assess Iron Levels in Rat Brain Tumors". In: *Proceedings of the International Society of Magnetic Resonance in Medicine 22nd Conference*. (Milan, Italy). May 2014
11. Tim Goorley, Casey Anderson, and et. al. *Useful prompt radiation applications and capabilities with MCNP6 (LA-CP-12-00490)*. Nuclear Weapons Effects User Group. 2012
12. Tim Goorley, Jeff Bull, and et. al. "MCNP6 Efforts for EMP, atmospheric dispersal, and unstructured mesh tracking (LA-CP-01705)". In: *Proceedings of the Nuclear Explosives Design Physics Conference 2011*. (Los Alamos National Laboratory, Los Alamos, New Mexico). Oct. 2012
13. Casey Anderson, Karen Kelley, and Tim Goorley. "Unstructured mesh human phantoms with MCNP". in: *Transactions of the American Nuclear Society* 106 (2012), pp. 50–51
14. ‡ Casey Anderson, Tim Goorley, and Karen Kelley. "Mesh Human Phantoms with MCNP (LA-UR-12-01307)". In: *2012 3DS Simulia Community Conference Proceedings*. (Providence, Rhode Island). May 2012, pp. 556–568

‡Presentation Included; §Presentation Only; ||*Magna Cum Laude*

PATENTS

- i. Kevin Koch and Casey Anderson. *System and method for localized processing of quantitative susceptibility maps in magnetic resonance imaging*. WO Patent App. PCT/US2016/038,723. Dec. 2016. URL: <https://www.google.com/patents/WO2016209930A1?c1=en>, [Link](#)

REFERENCES

Managers / Advisors				Co-workers			
Brent Budden	ISR-1, LANL	bbudden@lanl.gov	505-695-6236	James Tutt	NEN-5, LANL	jtutt@lanl.gov	214-207-0841
Matt Griffin	NEN-5, LANL	griffin@lanl.gov	505-500-7010	Garret McMath	NEN-5, LANL	gem@lanl.gov	505-690-0854
Russ Johns	NEN-5, LANL	johns@lanl.gov	505-695-5201	Tony Nettleton	NEN-5, LANL	asnettleton@lanl.gov	505-667-6569
Kevin Koch	MCW	kmkoch@mcw.edu	414-955-4034	Pete LaViolette	MCW	plaviole@mcw.edu	414-456-7490
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