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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**

<b>Graduate Research Assistant</b>	<i>NEN-5, Systems Design &amp; Analysis</i> <sup>1</sup>	2016 - Present
<b>Graduate Research Assistant</b>	<i>ISR-1, Space Science &amp; Applications</i> <sup>2</sup>	2016 - Present
<b>Post Master's Research Assistant</b>	<i>W-13, Advanced Engineering Analysis</i> <sup>3</sup>	2011 - 2012
<b>Summer Intern</b>	<i>XCP-3, Monte Carlo Codes</i> <sup>4</sup>	2010

- Implemented new features in MCNP6 through writing code, developing benchmarks, publishing reports, and presenting the new features at various conferences [Pubs: [5,6,8,9,10](#)]<sup>1</sup>
- 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<sup>2</sup>
- 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<sup>2</sup>
- Managed the deployed server of NDFOM, including SQL database<sup>2</sup>
- 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<sup>3</sup>
- Developed unstructured mesh human phantoms for health physics applications with MCNP6 [Pubs: [4,14](#)]<sup>3</sup>
- \*Acquired DOE Q-level security clearance and assisted on the analysis of the W-88 weapons system<sup>3</sup>
- Created a software visualization package for finite element geometries in MCNP simulations<sup>4</sup>
- Utilized the high performance computing (HPC) systems and utilities for advanced physics simulations and analysis<sup>1-4</sup>

\* Paperwork submitted June, 2016 for reinstatement of DOE Q-level clearance

**Medical College of Wisconsin****Milwaukee, Wisconsin**

<b>Graduate Research Assistant</b>	<i>Department of Biophysics</i> <sup>1</sup>	2012 - 2016
<b>Biophysics Representative, IT Liason</b>	<i>Graduate Student Council</i> <sup>2</sup>	2014 - 2016

- Funded my graduate studies through conducting the background research, providing the preliminary results, and co-authoring a successful [R21](#) National Institute of Health (NIH) grant<sup>1</sup>
- Patented a segmented reconstruction technique for artifact reduction in Magnetic Resonance Imaging [Pat: [i](#)]<sup>1</sup>
- 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: [11,12,13](#)]<sup>1</sup>
- Collected my own data, provided the necessary care for our experimental animals, and greatly expanded my laboratory and engineering skills by performing a variety of hands-on experimental and engineering tasks<sup>1</sup>
- Facilitated communication between students and staff with the university's Information Technology group<sup>2</sup>

**University of Wisconsin - Madison****Madison, Wisconsin**

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

- 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 teaching local Boy Scout chapters to achieve their merit badges

## Areas of Expertise

### Physics/Engineering

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

### Software

- MCNP
- Abaqus/CAE
- Linux
- Matplotlib
- Microsoft Office
- Google Docs
- Matlab
- MacOS
- Eclipse IDE
- Django Webframework
- PostgreSQL
- Windows
- GADRAS
- VisIt
- RELAP

### Programming

- Python
- Bash
- L<sup>A</sup>T<sub>E</sub>X
- Unit Testing
- Object Oriented
- Matlab
- Mercurial
- Git
- C/C++
- Fortran
- Debugging
- HTML
- Javascript
- Java
- Android

### Other Skills

- Mentoring/Leadership
- Technical Writing
- Presentations
- Version Control
- File Input/Output
- Scripting
- 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 (Skill Level)

- Expert ● Intermediate ○ Beginner

## Awards & Honors

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

## Affiliations

American Nuclear Society (ANS)	2008-2012, 2016-Present
American Association of Physicists in Medicine (AAPM)	2009-2011, 2013-2016
International Society of Magnetic Resonance in Medicine (ISMRM)	2012-2016

## Education

### Primary Education

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

<sup>†</sup>Thesis: "Quantitative Susceptibility Mapping: Exploratory Development and Initiation of Processing Pipelines"

### Additional Classes & Trainings

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

## References

A list of professional, academic, and personal references can be at <https://app.box.com/v/andersonreferences>

## Publications & Presentations

1. “MCNP6.2 User’s Manual”. In: *LANL report: TBD* (2017)
2. *Useful prompt radiation applications and capabilities with MCNP6 (LA-CP-12-00490)*. Nuclear Weapons Effects User Group. 2012
3. Nuclear Explosives Design Physics Conference. “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
4. 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
5. 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,
6. ‡ 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 Francisco, California). 2017, [Link](#)
7. § 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 Francisco, California). 2017
8. ‡ 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, [Link](#)
9. ‡ James Tutt, Casey Anderson, and Gregg McKinney. “Background-Source Cosmic-Photon Elevation Scaling and Cosmic-Neutron/Photon Dose Scaling in MCNP6 (LA-UR-16-24928)”. In: *24th Conference on Applications of Accelerators in Research and Industry*. (Forth Worth, Texas). Nov. 2016, [Link](#)
10. 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, [Link](#)
11. || 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, [Link](#)
12. † 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, [Link](#)
13. 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, [Link](#)
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, [Link](#)

‡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?cl=en>, [Link](#)