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Casey A. Anderson

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Professional Experience

Los Alamos National Laboratory *Los Alamos, New Mexico*

2017 - *Present*	**Theoretical Design Scientist**	*XTD-PRI, Primary Physics*
2016 - 2017	**Graduate Research Assistant**	*NEN-5, Systems Design & Analysis* | *ISR-1, Space Science & Applications*
2011 - 2012	**Post Master's Research Assistant**	*W-13, Advanced Engineering Analysis*
2010	**Summer Intern**	*XCP-3, Monte Carlo Codes*

- Performed a variety of tasks related to the development, design, implementation, testing, validation, and verification of a variety of Computational Physics projects including:
  - Writing software in Python, Fortran, C/C++, HTML, and Javascript using tools such as Django and Jenkins
  - Unit-testing and building the framework for the Continuous Integration of the Common Modeling Framework (CMF)
  - Adding features such as δ-ray production, correlated secondary particles, and detector response functions to MCNP6
  - Creating tools for the automated analysis of a variety of detector systems, sources, and configurations for the Nuclear Detection Figure of Merit (NDFOM) project.
  - Multi-physics coupling of radiation transport in MCNP6 and finite-element analysis in Abaqus/CAE for the Engineering Campaign-7 Nuclear Survivability project
  - Developing computational human phantoms for health and medical physics applications with MCNP6
  - Publishing and presenting these new features at conferences [Pubs: 2, 3, 4, 5, 6, 7, 11,12, 13, 14]
  - Utilizing LANL's high performance computing (HPC) for performing physics simulations and analysis.
- Performed a variety of additional software development tasks such as version control using Git & Mercurial, configuring and securing websites through Apache, database management using SQL, and maintaining our teams Linux server
- Gained significant experience in for applications involving nuclear physics, radiation transport, radiation detector systems,

Medical College of Wisconsin *Milwaukee, Wisconsin*

2012 - 2016	**Graduate Research Assistant**	*Department of Biophysics*
2014 - 2016	**Biophysics Representative, IT Liaison**	*Graduate Student Council*

- Conducted research and performed tasks towards pursuit a Master's Thesis such as:
  - Contributing to a successful R21 National Institute of Health (NIH) research grant and funding my graduate research.
  - Patenting a segmented reconstruction technique for artifact reduction in Magnetic Resonance Imaging [Pat: i.].
  - Acquiring hands-on laboratory experience developing equipment
  - Interacting with patients and collaborating medical doctors to conduct research in a clinical setting
  - Analyzing and processing large imaging database for detecting clinical applications to our database
  - Writing publications and presenting finding at various international conferences [Pubs: 8,9,10].
- 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**	*Department of Medical Physics*
2010 - 2011	**Chapter President**	*American Nuclear Society (ANS)*

- 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
- ● LaTeX
- ● 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**	*Los Alamos National Laboratory*
May, 2016	**Magna Cum Laude**	*Abstract, ISMRM Proceedings*
May, 2014	**Silver Medal**	*Student Poster Presentation, ISMRM Conference*
2009, 2010	**Exelon Scholarship**	*University of Wisconsin - Madison*

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**†	*Medical College of Wisconsin*
May, 2011	**M. Sc, Nuclear Engineering & Engineering Physics**	*University of Wisconsin - Madison*
May, 2011	**B. Sc, Nuclear Engineering**	*University of Wisconsin - Madison*

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

Additional Classes & Trainings

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

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?cl=en, Link

References

Managers / Advisors

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