OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 01/31/2026)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Brian Mark Anderson

eRA COMMONS USER NAME (credential, e.g., agency login): BrianMAnderson

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE  (if applicable) | Completion Date  MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| Georgia Institute of Technology  Atlanta GA | BS | 5/2015 | Nuclear and Radiological Engineering |
| University of Texas Graduate School of Biomedical Sciences at Houston & UT MD Anderson Cancer Center (MD Anderson)  Houston, TX | S.M.S  Ph.D | 9/2017  10/2017 | Therapeutic Medical Physics  Diagnostic Imaging Medical Physics |
|  |  |  |  |
| University of California, San Diego  San Diego, CA | Residency | 07/2023 | Therapeutic Medical Physics |
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**A. Personal Statement**

Throughout my career, I have been driven by a passion for leveraging artificial intelligence (AI) and deep learning to improve patient care. My expertise lies at the intersection of medical imaging, radiation oncology, and machine learning, where I have consistently demonstrated a commitment to translating research into practical solutions.

With a foundation in AI acquired during my master’s and doctoral studies, I have continually sought to expand areas of innovation in healthcare. My early work focused on developing models to automate complex tasks in medical imaging, particularly in tissue detection and treatment delivery. My contributions in this area led to the deployment of automated segmentation algorithms for critical structures, streamlining clinical workflows and enhancing treatment precision.

Building upon this, my research has evolved to encompass predictive modeling of patient outcomes and target volumes. These models not only empower clinicians with valuable insights but also enable tailored interventions that hope to optimize patient care pathways.

In addition to my research contributions, I am committed to advancing standardization efforts within the field of radiation oncology. As a member of Task Group 263 (TG-263), I have played a pivotal role in developing consensus guidelines and standardizing nomenclature for radiation therapy treatment planning. By fostering collaboration and promoting best practices, I strive to ensure consistency and quality across treatment centers, ultimately enhancing the efficacy and safety of radiation therapy for patients worldwide.

Looking ahead, my overarching goal is to continue bridging the gap between AI innovation and clinical practice, driving transformative change in healthcare delivery. Whether through the development of novel algorithms, the implementation of predictive analytics, or the advancement of standardization initiatives, I remain steadfast in my commitment to improving patient outcomes and shaping the future of healthcare through AI and deep learning.

**B. Positions, Scientific Appointments, and Honors**

**Positions and Scientific Appointments**

**2023 – Present** Associate Editor: The International Journal of Medical Physics Research and Practice

2023 – Present Clinical Assistant Professor, Department of Radiation Oncology, University of North Carolina

2023 – Present Member: AAPM Machine Intelligence Subcommittee

2023 – Present Member: AAPM Medical Physics Board of Associate Editors

2021 – Present Member: AAPM Task Group 263: Standardizing Nomenclatures in Radiation Oncology

2020 – 2021 Ad hoc Associate Editor, The International Journal of Medical Physics Research and Practice

2019 – Present Member: Medical Physics for World Benefit (MPWB)

2019 AAPM Summer School Teaching Assistant

2018 – 2019 AAPM WizKids educator

2019 – 2021 MD Anderson International Student Association Domestic Liaison, founding member

2015 – Present American Association of Physicists in Medicine (AAPM) Member

**Honors/Awards/Grants**

2022 AAPM Jack Krohmer Early Career Investigator Competition Winner – EPIDEEP: Predicting In-Vivo EPID Transit Images – a Deep Learning Approach

2021 Alfred G. Knudson Jr. Outstanding Dissertation Award: $5,000 Award established by MD Anderson Cancer Center to honor the late Dr. Knudson in recognition of the top selected PhD dissertation.

2021 AAPM Practical Big Data Workshop, Early Career Investigator – Impact Award

2020 Dr. John J. Kopchick Fellowship

2019 Society of Interventional Radiology: Allied Scientist Grant

2019 Science Council Session, AAPM

2019 Association of Science Communication 2019 Oral Competition: 1st place

2018 People’s Choice Award for Medical Physics Slam AAPM annual meeting

2018 1st Place Medical Physics Slam for South West AAPM annual meeting

2018 Young Investigator Award for South West AAPM annual meeting

2018 Early Career Medical Physicist Scholar from Winter Institute of Medical Physics (WIMP)

2017 2nd place Student Research Retreat, MD Anderson

2015 Graduated with Highest Honors, Georgia Institute of Technology

2014 AAPM Summer Fellowship: Commissioning of new Elekta LINAC

2014 Recipient of the Presidents Undergraduate Research Award (PURA)

2013 Recipient of the Presidents Undergraduate Research Award (PURA)

**C. Contributions to Science**

Throughout my academic journey, I've made significant strides in leveraging advanced technologies to address critical challenges in medical imaging and radiation oncology, ultimately aiming to improve patient care and outcomes.

I first became interested in machine learning during my master’s work in 2015. The goal of my project was to create an autocontouring system which would accurately identify and differentiate cervical cancer nodes on non-contrast CT images. This work was important namely because 70% of the incidence and mortality burden of cervical cancer occurs in low- and middle-income countries where PET and contrast-CT images are not often available. Overcoming the inherent limitations of non-contrast CT imaging, which offers minimal tissue distinction, required innovative approaches. Drawing from machine learning techniques, including ensemble-based models, I successfully identified unique characteristics of cervical cancer nodes, such as their ellipsoidal or spherical shape. This work underscored the potential of machine learning in resource-constrained settings and laid the foundation for my deepening interest in advanced modeling techniques.

Building upon this foundation, my doctoral research delved into the realm of deep learning and its application in oncological imaging. While initially focused on biomechanical modeling to enhance ablative treatment of liver disease, my research trajectory shifted towards harnessing the power of convolutional neural networks (CNNs) for liver segmentation. The work culminating in the development of a CNN-based segmentation model that significantly reduced the labor-intensive nature of liver segmentation. This led to the clinical implementation of the model at my institution, facilitating over 300 segmentations by the time I graduated.

The successful outcomes of my doctoral research have paved the way for tangible clinical impact, including the facilitation of a phase 2 clinical trial with our interventional radiology team. This pivotal milestone underscores the translational potential of my work and reaffirms my dedication to bridging the gap between research innovation and clinical practice.

My contributions extend beyond individual projects to encompass broader initiatives aimed at standardizing practices within radiation oncology. As evidenced by my involvement in Task Group 263 (TG-263), I am deeply committed to fostering collaboration and implementing standardized protocols to ensure consistency and quality across treatment centers. To this end, we’ve published a C# based program to facilitate clinics in the transition of previous templates into TG-263 standard templates. By advocating for the integration of deep learning techniques in segmentation tasks and leveraging my expertise in biomechanical modeling, I strive to advance the field towards greater precision and efficiency.

In summary, my contributions to science encapsulate a multifaceted approach encompassing machine learning, deep learning, and standardization efforts in radiation oncology. By pushing the boundaries of technological innovation and advocating for collaborative frameworks, I am committed to driving positive change in the field and ultimately enhancing patient care on a global scale.

1. Gay S, Kisling K, **Anderson B.M,** Zhang L, Rhee D.J, Nguyen C., Netherton T., Yang J., Brock K., Jhingran A., Simonds H., Klopp A., Beadle B. M., Court L., Cardenas C. *Identifying the optimal deep learning architecture and parameters for automatic beam aperture definition in 3D radiotherapy* Radiation Oncology Physics 09/2023
2. **Anderson B.M,** Wahid K., Brock K. *Simple Python Module for Dicom and RT: Conversions to Images and Masks, and Predictions to Dicom-RT Structures* Practical Radiation Oncology 02/2021
3. Rigaud B, **Anderson B.M**, Yu ZH, Gobeli M, Cazoulat G, Söderberg J, Samuelsson E, Lidberg D, Ward C, Taku N, Cardenas C, Rhee DJ, Venkatesan AM, Peterson CB, Court L, Svensson S, Löfman F, Klopp AH, Brock KK *Automatic segmentation using deep learning for online dose optimization during adaptive radiotherapy of cervical cancer* International Journal of Radiation Oncology, Biology, Physics 10/2020
4. **Anderson B.M**, Lin EY, Cardenas CE, Gress DA, Erwin WD, Odisio BC, Koay EJ, Brock KK*Automated Contouring of Contrast and Non-Contrast CT Liver Images with Fully Convolutional Networks (FCNs)* Advances in Radiation Oncology 05/2020