

ZHUOYUN HUANG

Medical Physics Ph.D. Student | University at Buffalo
+1 9194027218 | Zhuoyun.huang@duke.edu | Durham, NC, US

EDUCATION

University at Buffalo	08/2026-Current
<i>Ph.D. in medical physics, CAMPEP accredited</i>	Buffalo, NY, US
Duke University	08/2024-05/2026
<i>M.S. in medical physics, CAMPEP accredited</i>	Durham, NC, US
- Expected:06/2026 - GPA:3.70 - Thesis: Prediction of Normal Brain Tissue Toxicity in Single-Isocenter Multiple-Target Stereotactic Radiosurgery (SIMT SRS) Using Gradient Boosted Machine Learning Models - Thesis Advisor: Chunhao Wang, PhD	
University College London	09/2021-07/2024
<i>Bachelor of Science in Physics</i>	London, UK
GPA: 3.75	

AWARDS AND SCHOLARSHIP

2025 Dean's Research Award	10/2025
2025 Research Scholarship from Medical Physics Graduate Program	04/2025
Tuition Scholarship from Medical Physics Graduate Program	08/2024

CLINICAL EXPERIENCE

Clinical Practicum, Duke University	08/2025-Present
- Completed a structured 12-session practicum covering radiation therapy operations from facility orientation through advanced treatment techniques. - Observed linear accelerator (LINAC) hardware, tools, and machine monthly QA procedures; gained exposure to TG-51 absolute dose calibration. - Participated in Stereotactic Body Radiation Therapy (SBRT) and Stereotactic Radiosurgery (SRS) workflows, including simulation, treatment planning, electronic medical record (EMR) integration, and delivery QA. - Learned special clinical procedures such as total body and total skin irradiation and reviewed key aspects of radiation safety and information technology	
External Beam Planning, Duke University	
- Performed image registration (CT-CT and CT-MR) to support accurate target delineation and treatment planning. - Participated in planning and evaluation of lung SBRT, prostate SBRT, and brain VMAT cases, including target/OAR contour review and DVH-based plan quality assessment (conformity, dose gradients).	

RESEARCH EXPERIENCE

Prediction of Normal Brain Toxicity in SRS Using Machine Learning	10/2024-Present
<i>Academic supervisor: Chunhao Wang, PhD</i>	In-Person
- Designed and validated four Gradient Boosted Regression Tree (GBRT) models (individual, clustered, combined 3-in-1, and clustered 3-in-1) to predict normal brain dose-volume endpoints V50%, V60%, and V66.7% for single isocenter multiple target (SIMT) stereotactic radiosurgery (SRS). - Applied K-means clustering on log-transformed tumor features to capture spatial heterogeneity and guide cluster-specific model training, which improved accuracy and interpretability. - Performed 10-fold cross validation and evaluation on an independent test cohort of 50 patients to confirm model	

robustness and clinical relevance.

- Developed Eclipse Scripting API (ESAPI) automation that integrates model predictions directly into the treatment planning system to provide real-time toxicity risk assessment during SIMT SRS planning

Application of Fourier Analysis in Quantum Mechanics and Biomedical Imaging 08-11/2023

Group Researcher, Supervisor: Professor F. Alberto Grunbaum from UC Berkeley Remote

Study of Cosmic Stars Based on Computer Simulation 07-08/2020

Group Supervisor: Professor Yanbei Chen from Caltech Remote

SCHOLARLY CONTRIBUTIONS

Journal Articles

1. **Huang Z.** (Accepted, 2026. *Journal of Radiosurgery and SBRT.*) Prediction of Normal Brain Tissue Toxicity in Single-Isocenter Multiple-Target Stereotactic Radiosurgery (SIMT SRS) Using Gradient Boosted Machine Learning Models
2. **Huang Z.** (2024). Investigation of electron beam depth-dose curve using EGSnrc. Highlights in Science, Engineering and Technology, 88, 1081–1087. <https://doi.org/10.54097/ckxqg594>
3. **Huang Z.** & Yu H. (2021). Electromagnetic signal from a circumbinary gas disk around merging binary black holes. IOP Conference Series: Earth and Environmental Science, 658(1), 012033. <https://doi.org/10.1088/1755-1315/658/1/012033>

Oral Presentation

- **Huang Z.**, Zhao J, Lu K, Ginn J, Yang Z, Xie Y, Kim Y, Wang C. Predicting Brain V60% in Linac-Based Single-Isocenter-Multiple-Targets (SIMT) Stereotactic Radiosurgery Machine Learning. In 67th Annual Meeting of American Society of Physicists in Medicine (AAPM), Washington, DC 2025

Poster Presentation

- **Huang Z.**, Zhao J, Mullikin T C, Lu K, Ginn J, Yang Z, Xie Y, Wang C. Design and evaluation of a unified machine learning model for predicting normal brain toxicity in single-isocenter multi-target stereotactic radiosurgery. In 67th Annual Meeting of American Society of Radiation Oncology (ASTRO), San Francisco, LA 2025

INTERNSHIP

Suzhou Maxwell Technologies Co., Ltd 06-08/2023

Engineer Assistant, PVD Technical Center Suzhou, China

- Supported equipment renovation and plasma process testing and analyzed magnetic field simulations and modeling discharge behavior using Astra software

PROFESSIONAL AFFILIATIONS

Student Member, American Association of Physicists in Medicine (AAPM) 2024-present

Student Member, American Society for Radiation Oncology (ASTRO) 2025-present

SKILLS

Proficient in Eclipse Treatment Planning System (TPS) and ESAPI scripting

Scientific programming in MATLAB, Python and C#

Data analysis and visualization

Plasma simulation and modeling using Astra

Thin film deposition techniques (PVD systems)

ACTIVITIES

Poster, Duke Cancer Institute 2025 Cancer Biology Retreat 11/2025

Volunteer, 2025 Bull City Race Fest on behalf of Duke Cancer Institute 10/2025

Volunteer, Duke Medical Physics 2025 Open House 02-03/2025

Transition Mentor, University College London: Delivered mentoring sessions to freshmen students 09-12/2023