

Department of Physics Colloquium

Speaker: Professor Wazir Muhammad, PhD

Florida Atlantic University

“Digital Twins of Cancer Patients for their Personalized Treatments”

Open to the public, free of charge

Monday, November 10, 2025 - 4:00 pm —1110 Rood Hall

Refreshments: 3:30-3:50 p.m., Bradley Commons, 2202 Everett Tower

Abstract: Digital twins in radiation oncology are patient-specific virtual digital models that integrate clinical, imaging, biological, and treatment data to simulate and predict therapeutic outcomes. These models are continuously updated with new information, allowing them to reflect the evolving condition of a patient during cancer treatment. By using advanced computational methods such as machine learning and reinforcement learning, digital twins can forecast tumor and normal tissue responses to various radiation strategies, compare treatment options, and support adaptive radiotherapy. Their applications include optimizing treatment planning, predicting toxicity and tumor control, guiding mid-treatment plan adjustments, and improving long-term outcome predictions. Digital twins also function as clinical decision-support tools, enabling clinicians to personalize care while reducing risks of under- or over-treatment. Ultimately, this approach has the potential to transform precision oncology by bridging computational modeling with clinical workflows, enhancing treatment effectiveness, and reducing disparities across diverse patient populations.

Parking: Metered parking is available in Parking Structure #2, near Miller Auditorium.

Campus map <http://wmich.edu/maps/printables.php>

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