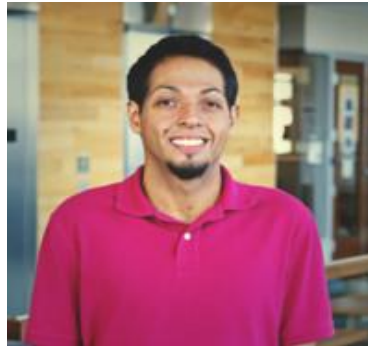**MARQUETTE UNIVERSITY**

"Towards Generalizable, Scalable and Explainable AI Methods for Satellite Imagery Analysis"

Dr. Philipe Ambrozio Dias

Postdoctoral Research Associate in Machine Learning and Computer Vision - Oak Ridge National Laboratory (National Security Sciences directorate)

Tuesday, October 26th, 2021
2:00 – 3:00 p.m. Olin 202
Reception in Olin 204 3:00 – 3:30 p.m.

Abstract: The ever-increasing availability of high-quality remote sensing imagery presents great potential for applications such as urban dynamics planning, environment monitoring and disaster response. A crucial requirement to harness such potential is the ability to generate accurate, reliable estimates of structures of interest from the available data. While models based on deep learning have significantly advanced the state of the art of image analysis, their application for Earth observation is still hampered by major challenges related to *generalization* and *scalability*. Models often fail to generalize across different areas of interest, image acquisition conditions and data distribution, and image analysis at larger-scales (e.g. country-level) imposes challenges both from a computational as well as model-design perspective. In this talk, I'll briefly introduce the Oak Ridge National Laboratory (ORNL), its mission, research areas, and resources such as the Summit and Frontier supercomputers. I'll then talk about the research conducted at our GeoAI group, with particular focus on the contrast between remote sensing and natural images, domain adaptation techniques, as well as model- and data-distributed frameworks. The problem of building footprint extraction across different imagery sources will be used as example for many of the topics to be covered.

Philipe Ambrozio-Dias, Ph.D. is currently a Postdoctoral Research Associate at the Oak Ridge National Laboratory (ORNL), after receiving his PhD degree in Electrical and Computer Engineering from the Marquette University in Fall/21. His research topics include supervised and unsupervised learning, combined with probability theory and stochastic simulation applied to computer vision models. His work has found application in agricultural automation, healthcare-related scenarios, image annotation tools, and currently in the analysis of remote sensing imagery. Before his PhD at Marquette, as result of a double masters degree Philipe had received his M.Sc. in Information Technology from the Hochschule Mannheim (Germany) and his M.Sc. in Electrical & Computer Eng. from the Federal University of Technology (UTFPR, Brazil).