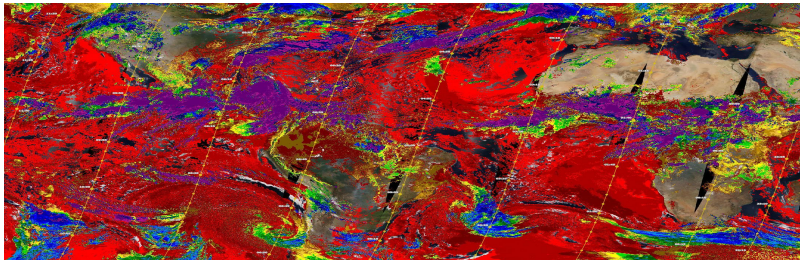
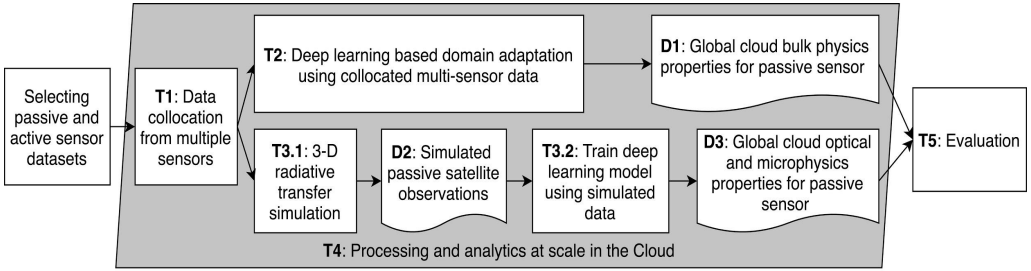
Developing Passive Satellite Cloud Remote Sensing Algorithms using Collocated Observations, Numerical Simulation and Deep Learning

PI: Jianwu Wang[1], Co-Is: Sanjay Purushotham[1], Zhibo Zhang[2], Chenxi Wang[3], Kerry Meyer[3]
[1] Department of Information Systems, UMBC, [2] Department of Physics, UMBC, [3] NASA GSFC

Brief description. We will develop a platform on AWS to generate accurate cloud property training datasets for passive satellite cloud remote sensing algorithms using collocated satellite observations, 3D radiative transfer (RT) simulations and deep learning methods.

Expected outcomes. 1) Cloud (bulk, microphysical & optical) properties retrieval algorithms for passive satellites by leveraging active satellites and 3D RT simulation, 2) Scalable data processing/analytics services on AWS, 3) Four-year labeled cloud property training data from the polar-orbiting VIIRS satellite and the geostationary GOES-16 satellite.





Major milestones. Following iterative development cycle, our milestones are: 1) Year 1: First release of individual components (collocation algorithm, deep learning models for cloud property retrieval, and scalable cloud services), 2) Year 2: Second release of individual components and first release of full platform with one-year training datasets, 3) Year 3: Third release of individual components and second release of full platform with four-year datasets.