U.S. DEPARTMENT OF ENERGY AlgaePrize NextGen Algal Innovators

Team Name:

PhycoSight

Team Schools/Organizations:

Georgia Institute of Technology, Atlanta, GA

Abstract:

ARTiMiS is the first instrument of its kind as an ultra-low-cost imaging platform with onboard embedded image processing that uses custom computer vision and deep learning "AI" designed specifically for edge computing performance, which we call PhycoSight. This combined hardware-software project has been specifically developed for microalgal quantitation at the point of sampling, both for industrial-scale cultivation systems and for environmental monitoring. After having already proven the concept for effectiveness in taxonomic classification, we aim to advance ARTiMiS+PhycoSight to enable phenotypic characterization of clonal and mixed community microalgal cultures. This will lower the barrier to access for detailed real-time algal culture monitoring, thus enabling process performance optimization through closed-loop feedback control, improving detection of contaminating and/or predatory microorganisms, and hopefully opening the door for a body of knowledge to build around phenotypic indicators of good vs. poor culture performance across the industry.