**Abstract**

At the University of Kentucky Center for Applied Energy Research, recent efforts have been made to optimize and reduce the cost of a unit designed to control an automated photobioreactor system in which microalgae is grown to reduce CO2 emissions. In contrast with a previously used system based on a compactRIO controller and NI LabVIEW software, a new optimized version utilizes an inexpensive Beagle Bone panel as a microcontroller that can be programmed through the use of Python software. Notably, the cost of the new control system was 1/10th of the price of the previous unit.