November 11, 2020

To:

Student Sustainability Committee
University of Illinois at Urbana-Champaign.

Dear Student Sustainability Committee,

I am writing to express my strong support for the funding application from Steve Ford, Xinlei Wang and others for funds to restore the Re_Home (or Solar Declathon House). Over the course of the past 8 months, the Re_Home has proved invaluable as a student education facility not only to learn about sustainable living with zero energy, but also for digital agriculture and robotics experiments at the Illinois Autonomous Farm.

The Illinois Autonomous Farm (IAF) is an experimental research facility being established jointly by the Center for Digital Agriculture (CDA) and the Department of Agriculture and Biological Engineering (ABE) as a prototype "farm of the future." The IAF serves as an experimental research and education facility in new areas such as autonomous planting, weeding, spraying, harvesting, and high-throughput phenotyping (important for breeding new seed hybrids). These applications build on a number of novel technologies, including autonomous robot navigation, computer vision for diverse tasks (e.g., measuring plant phenotypes, detecting disease or stress, or identifying berries or vegetables for harvest), machine learning on resource-constrained devices (aka, "edge computing"), and wireless sensor networks.

The Re_Home is located at the edge of the IAF fields, and has been a crucial feature. It has provided an essential working space for students during regular day-long experiments throughout the growing season, and a place to host demonstrations for visitors. It also provides a convenient, safe place to store robots, computers, cameras, and other experimental equipment. Most interestingly, it has provided a *zero-carbon energy source for recharging the four or five robots* used at the IAF, which gets us closer to a exciting long-term goal of carbon-neutral agriculture.

I would like to emphasize the education opportunities supported by the Re_Home through IAF activities. This year, the students at the farm were graduate and a few undergraduate students from the College of Agriculture (ACES) and the Grainger College of Engineering, conducting research experiments. Next year, in addition to such experimental research, we expect one or more courses in robotics, AI, and computer systems to be able to conduct course projects using the IAF and Re_Home facilities. CDA is also purchasing a FarmBot^{TM} automated

growing system (see farm.bot) to be installed in the front yard of the Re_Home. The FarmBot purchase is being funded by a small grant from the Discovery Partners Institute, for use in research, class projects and outreach to K-12 schools. All of these project activities will benefit greatly from having the Re_Home available nearby.

Sincerely,

Vikram S. Adve
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University of Illinois at Urbana-Champaign