Mechanical/Environmental Sustainability Project

Sweat Energy

Mission Statement

To improve existing green technology by creating a more efficient way of capturing energy from a stationary bike while motivating cyclists.

Synopsis

Some exercise bikes use generators to capture electricity. However, the output power is related to the rotational speed of the wheel alone, which results in a loss of energy.

In order to lessen this loss and create a more efficient product, it was decided to use a more productive system composed of four parts connected to each other. A bike will hook up to a gearbox in order to control and lower the torque. The gearbox will also be connected to a continuously variable transmission (CVT), which regulates the revolutions per minute (RPM) ranges. The CVT in turn will be connected to an alternator, designed to produce a certain amount of power and linked to a generator controlled by a computer. The implementation of this device will allow us to create a retrofit regenerative design that not only capture the user energy but also minimize the loss of energy observed. It will also provide the opportunity for the gyms to profit from the hard work of their customer. As a benefit, the energy captured could be used to charge batteries for common personal electronics as well as lowering costs spent on electricity at the same time.

The initiative of this year's team was to try and create a functional prototype for a proof of concept. An attempt to formulate a viable system capable of handling design goals compatible with preliminary design ideas was achieved.

This project is in its first year phase within the program and will continue in 2015.

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