LIVING LAB **Learning Adventure**
Bates Wind Turbine

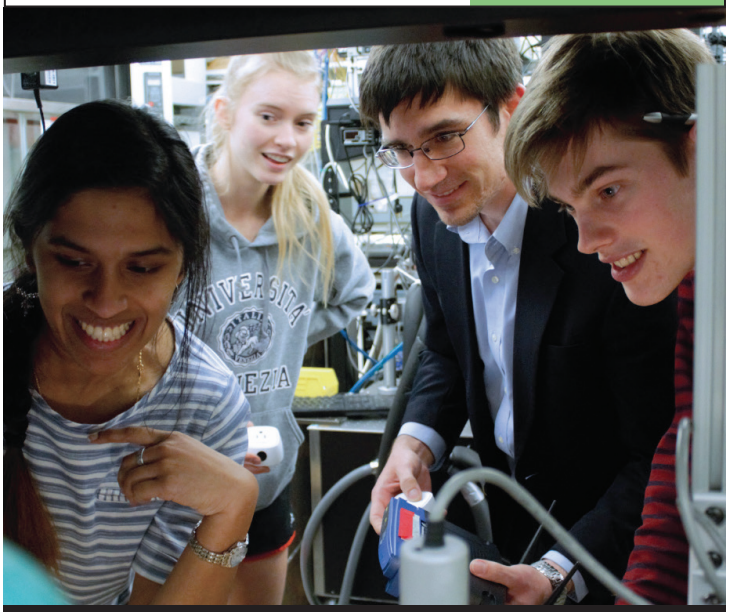
STCL
LOW CARBON CAMPUS

RESEARCH PROBLEM
Is it feasible to install a wind turbine on the MIT campus?

SOLUTION
Develop a wind turbine demonstration project that will utilize method for tracking all material flows and identifying the magnitude of environmental and economic impacts.

LIVING LAB **Learning Adventure**
Real Time Energy Monitoring

OPER
LOW CARBON CAMPUS

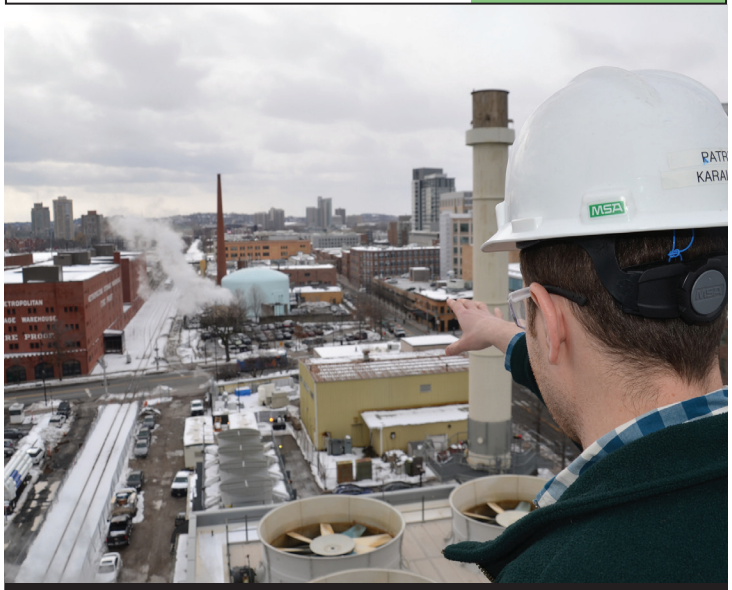


RESEARCH PROBLEM
How can research labs maximize the two pillars of sustainability: renewable energy and energy efficiency?

SOLUTION
Developed a real-time energy monitoring system for use in research labs.

LIVING LAB **Learning Adventure**
Water Savings in Cooling Towers

FACL
LOW CARBON CAMPUS



RESEARCH PROBLEM
U.S. power plants use an average of 139 billion gallons of freshwater per day. How can the amount of water required be reduced without sacrificing efficiency?

SOLUTION
Serious water efficiency enhancements, that do not sacrifice fuel efficiency, have to be introduced to power plants in order to meet our growing energy demand.ng energy demand.

LIVING LAB **Learning Adventure**
Cutaenous Grooves

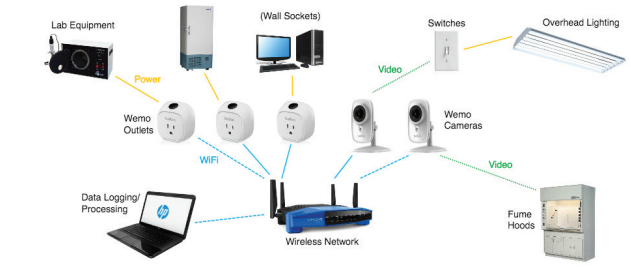
SORE
THRIVING NETWORKS

RESEARCH PROBLEM
How can the experience of music be made more tactile?

SOLUTION
Develop a method for coupling haptics technologies and music to develop a fundamental building blocks of a compositional language for touch.

LIVING LAB **Learning Adventure**
Real Time Energy Monitoring

OPER
LOW CARBON CAMPUS



Leading Players:
Daniel Preston, Ariel S. Anders, Evelyn N. Wang

Supporting Cast:
Environmental Health and Safety (EHS), Max Drake, Dheekshita Kumar, Georgia Phillips

The Story

In an effort to monitor lab-wide energy consumption, the researchers in the Wang Lab deployed a network of wireless energy monitors called "Wemos" that plug in-line (to the outlet) with lab devices and broadcast power use data to a computer which is recording and processing data. Devices that do not plug in to walls, such as overhead lights and fume hoods, were monitored by analyzing a live video stream. This energy monitoring system not only allows live feedback, but also provides a means to test "green" practices such as signage.

For more information, contact Daniel Preston @ dpreston@mit.edu

LIVING LAB **Learning Adventure**
Bates Wind Turbine

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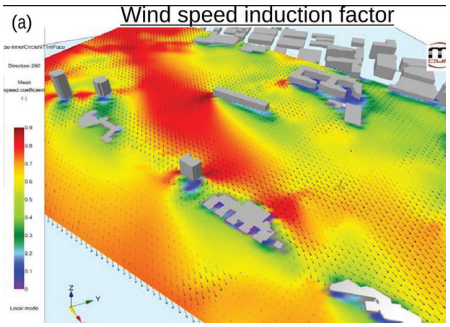


Leading Players:
MIT Department of Facilities, the Bates Lab within the Laboratory of Nuclear Science, Environment, health and Safety (EHS), MIT Student Energy Club

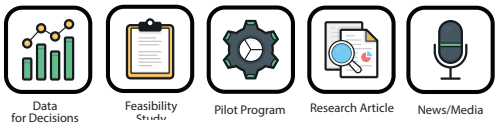
Supporting Players:
Keystone Tower Systems

Diagram of Computational Fluid Dynamics (CFD) utilized to examine the feasibility of installing a Wind turbine at the Batest Campus. Source: Kalmikov, A., dupont, G., Dykes, K. (2010). Wind Power Resources Asessment in Complex Urban Environment Campus Case-study Using CFD Analysis. Retrieved from: https://www.semanticscholar.org/paper/Wind-Power-Resource-Assessment-in-Complex-Urban-Kalmikov-Dupont/34ede0582e37d354fd16fe0aa7891 1c800cf1677.

The Story

The economic analysis of the Bates Turbine project commenced in 2006 and included investigating various locations on the 85 acre Bates site for a 1.5 MW turbine. A meterological tower was donated by NRG and located on the site to collect and analyze data for a 3 year period (2010-2013). During the process, an MIT alum introduced the idea of utilizing emerging spiral welding process which allowed the tower to be erected higher, where winds were stronger and more consistent. A grant was secured in 2013, permits were acquired and it was installed in May 2015.

For more information, contact Alex Kalmikov @ alexander.kal@gmail.com



LIVING LAB **Learning Adventure**
Cutaenous Grooves

SORE
THRIVING NETWORKS

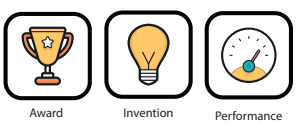
"It Fell in My Lap" and "A Seated Catalog of Feelings" are two artworks by Eric Gunther that blend sight, sound, and touch to generate surprising experiences for the body.

Leading Players: Eric Gunther
Supporting Cast: MIT Council for the Arts Grant Program, David Franklin (Audiological Engineering)

The Story

Eric Gunther (MS '02) held a series of concerts for the sense of touch. The series, called Cutaneous Grooves, took place at the MIT Media Lab. Each audience member put on a full-body wearable suit that let them feel intricate compositions of music and vibration against their skin. The project was supported by an MIT Arts Council Grant and was an extension of his Masters thesis with the Interactive Cinema Group. Eric continues to create artworks that explore the use of vibrations to create new experiences for the body.

Contact Eric Gunther @ sosolimited.com



LIVING LAB **Learning Adventure**
Waters Savings in Cooling Towers

STCL
LOW CARBON CAMPUS

Leading Players:
Maher Damak, Karin Khalil, Kripa Varanasi

Supporting Players:
Central Utilities Plant Engineers: Seth Kinderman, Patrick Karalekas, The Office of Sustainability

The Story

At the Varanasi Group at MIT, we have developed a technology to reduce water losses due to evaporation in power generation. The process, requires little maintenance, reintroduces water back into the cooling cycle and reduces the water treatment needs of power plants. This technology can work in any type of thermoelectric power plant, including coal, gas, nuclear, concentrated solar, and geothermal.

This team of researchers have won several awards for their work, including second place in the $100K Pitch competition, the audience choice (3k) at the 100k accelerate competition, and the Clean Energy Prize (50k).

Contact: Maher Damak @ mdamak@mit.edu, Karim Khalil@ Kkhali@mit.edu