Responsive Facades_ Solar Petal Field

DALE CLIFFORD
California Polytechnic State University

Solar Petals is a project that bridges photovoltaic energy harvesting, sensing technologies, programming and shape memory alloy actuation.

INTENT

Develop an energy neutral façade component that is responsive to light.

Beginning with study of the thermally triggered motion of the tulip petal, Solar Petals became a study in emerging material technologies that has been realized through collaboration between an interdisciplinary team of architects, artists, computer scientists and electrical engineers. As the tulip, opens and closes in response to heat, the petals are activated by shape memory alloys - a temperature activated actuator - that contract 6% of their length when charged by energy collected by photovoltaic cells.

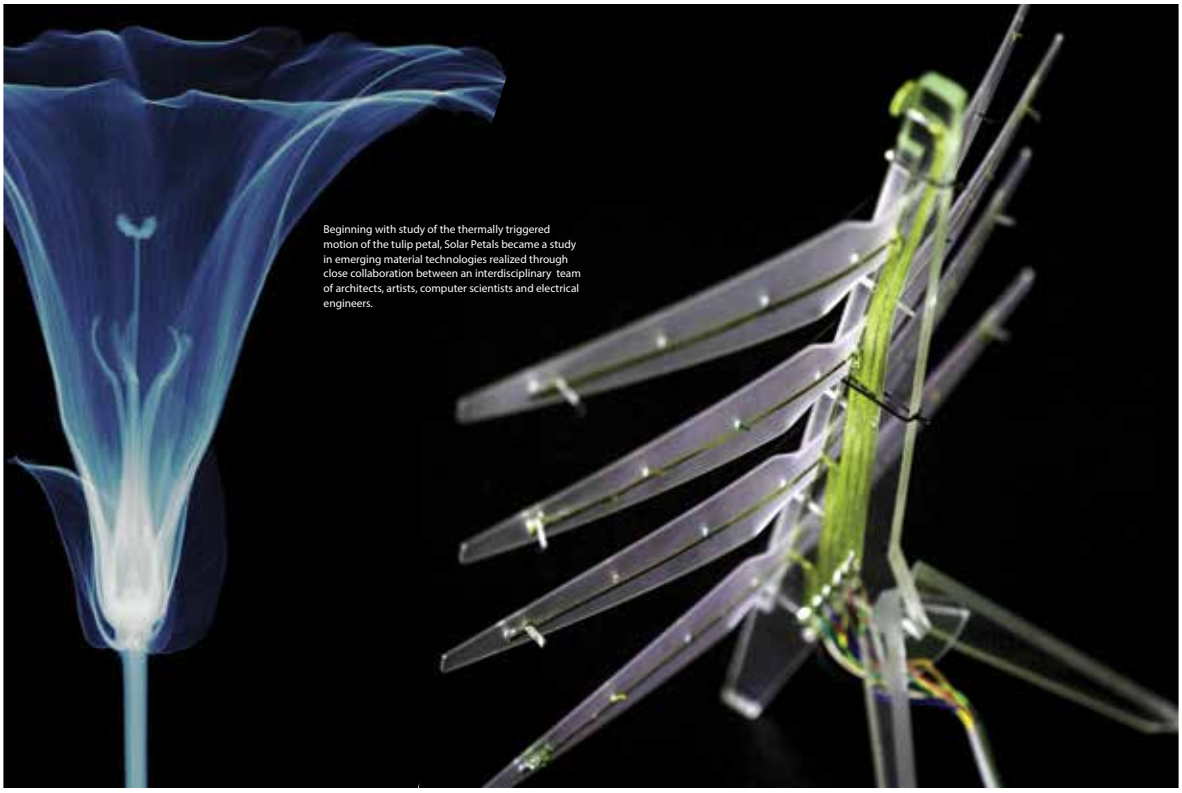
ENVIRONMENTAL DATA

The petal array is designed to sense changes in sunlight levels and translate this phenomena to coded electrical signals that activate the petal field. Petals become more active with increasing solar intensity, imparting an awareness of subtle environmental fluctuation to building occupants. We view this technology as a step in making architecture more adaptive and responsive to environmental change.

BIO_LOGIC MISSION

To better understand the porous boundaries between living and non-living systems we look to nature as a model network of interactive systems that produce no waste; observe that animals and plants have evolved a large variety of reliable and relatively simple mechanisms to adapt to environmental fluctuation; understand that the inherent complexity of biological mechanisms is an emergent property based on simple rule sets. Specifically we develop responsive building technologies that operate in accordance with the biologic condition of homeostasis – the ability for an organism to maintain equilibrium in response to fluctuating environmental conditions.

biologicarchitecture.com



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design group at Cal Poly, SLO

RESPONSIVE BUILDING TECHNOLOGY:
RESPONSIVE LUMINOSITY – SOLAR PETALS

RESPONSIVE BUILDING TECHNOLOGY:
ADVANCING ARCHITECTURAL HOMEOSTASIS THROUGH OBSERVATIONS OF BIOLOGICAL ADAPTATIONS.

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Design Team

Dale Clifford (PI)

Jacob Douanias

Zach Jacobson-Waever

Jake Marsico

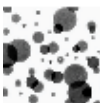

Artificial Bone

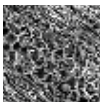

Cactus Tiles


Phase Change Materials


Acoustic Blocks


Responsive Shading


Polarized Filters


Micrographs


Water Walls