BIOS DESIGN COLLECTIVE

BIOS is a 501c3 nonprofit, established to explore the application of biological patterns to architecture and design. In this conceptual framework, the collective explores new techniques in crowd sourcing, collaborative process, self-organization, digital design and fabrication.

BIOS consists of founders Jess Austin, Chris Chalmers, and Charles Lee, and countless collaborators world-wide. The BIOS blog (www.biosarch.com) showcases our academic and built work.

Mission Statement
Technology is a biological process; a prosthetic extension of the human condition. We see the built environment as a living organism, dynamic and evolving in symbiosis with our own evolution. The environments and objects that we construct are inseparable from our biological selves in that they buffer, amplify and filter our interactions with the world around us.

Etymology of BIOS

Bio is the Latin word for life.
Bio is the primary driver for the hardware of the contemporary computer.
Bios is a living practice of collaborative architecture, adapting to our dynamic world.

Living organisms are distinguished from inanimate objects in that they exhibit metabolism, reproduction, and response to stimuli. Living organisms communicate: depending on feedback to find optimal patterns for their continued existence. They self-organize, living in negative entropy. As designers we find the patterns of life and use them to negotiate the layering of diverse parameters and constraints inherent in architectural design.
Photobioreactor Water Sculpture

A photobioreactor is a closed or semi-closed system in which light and nutrients are supplied to the system in an attempt to maximize algal biomass. Nutrients can be in the form of pollutants, so the sculpture can facilitate bio-remediation. It can also use CO2, reducing greenhouse gases. The algae can be harvested to be used to generate biofuel. In this proposal, the biofuel could be used to run the machinery and vehicles that maintain the park. These photobioreactors are designed in a sculptural manner to add an eye-catching feature to the park setting. With the glowing green translucent tubes, the work has a similarity to a Dale Chihuly installation. It consists of an aluminum carriage which has a continuous spiraling tube that cascades from top to bottom. The work could be lighted at night to create a beautiful evening experience powered by a solar array and batteries. The bioreactor towers were designed to be a harvesting machine which would extract the algae biomass. Examples of existing technology are shown, as well as a hypothetical installation.
San Jose Public Art Commission - Coloniatechne

As a design research group, our central point of inquiry is "Design at the intersection of biology and technology." As such, we are interested in the reciprocal effects between technology and human culture, particularly in the way that we use and exchange information. For our commissioned artwork by the city of San Jose, we are envisioning a project that explores the concept of collaborative self-organization through the lens of bio-inspired design and information technology. In the study of complex biological systems, agent-based self-organization emerges as one of the central mechanisms in their formation. Many biological organisms depend on symbiosis to leverage compatible flows of energy or material for mutual benefit. The core concept for our approach is inspired by the self-organization and symbiotic behavior of coral. Coral forms large colonies made from autonomous agents called polyps that act collectively and gradually execute over time, each species shaping to reflect through their characteristic individual behavior. We use these patterns to establish an exploration of live and interactive technology in the pavilion. Our proposal takes the form of a pavilion on Diridon Green located at the corner where the paths of travel from Diridon station branches toward the convention center and downtown. This path relates to City of San Jose's downtown core instead of either art objects that are part of the San Jose public art projects. The pavilion will provide a waiting area, the ceremonial, and a place of interest with interactive light and sound play. The location of the pavilion will serve people from Diridon station toward the other terminals, as the branching shape frames views of the downtown arts and convention center. The shape of the structure will also provide a focal point on Diridon Green, and define space for summer events.
Pacific Coast Interpretive Centers

The program aims to create a collective learning, living and working environment in the same spirit as many of the species that thrive in our coastal waters. The buildings will be a nucleus for experimentation and exploration in research that will lead to a healthier coastal environment. The exterior envelopes of the buildings will be a continuous growing phenotype that phenotypically responds to the specific site at each location.

The proposed centers highlight new technologies that utilize the ocean as the sustainable source of building energy, heating and cooling. The proposed interpretive center functions like many sea animals that utilize the essential ions of the Pacific coast, inhaling and exhaling in response to environmental conditions. It also functions as living system that collects and recycles rainwater from the exterior and interior of the buildings. The building is supported by open spaces and pools to opposition to traditional concrete infrastructure. Assembly areas are permeable that emphasizes a connection with the natural earth and allows for sustainable drainage practices. Data networks are organized using the same principles found in successful living systems operating in the coastal waters. Ideas of naturalness, industrial cooperation and waste instead of processing and dismantling will be proposed in living networks connected to the interpretive centers.