Solar Art - July 2017

Alex Nathanson | alex@alexnathanson.com | www.eforaging.com

6V Solar Mosaic: Refugees Welcome (Nathanson, 2017)

This class is designed to be an introduction to solar power art, covering basic electronic knowledge, hardware requirements, and a few design principles and methods . The class is for anyone who isn't a "professional" with a very basic understanding of electricity and a willingness to experiment.

Introduction 2

Electrical Concepts 2

Overview of solar panel/ solar powered art and design 3

Kinetic Solar Sculpture 3

Solar Mosaic 4

Additional Resources 4

Bio 4

Solar Art - July 2017

Alex Nathanson | alex@alexnathanson.com | www.eforaging.com

Introduction

What is solar power?

- Solar panels generate electricity through the photovoltaic effect. Some material naturally absorbs photons of light and releases electrons.
- Variable i.e. dependent on available sunlight and to a lesser degree temperature.

Two types of solar power implementation

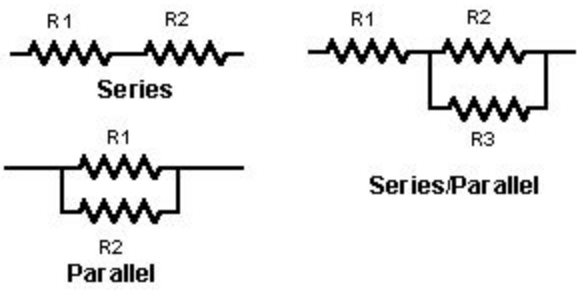
- On-grid (Connected to the public power grid)
- Off-grid (Not connected to the public power grid.)

Ways to implement off-grid solar power

- Direct from solar panel to load
- Solar panel to capacitors to load
- Solar panel to batteries to load

Electrical Concepts

- A circuit is a circular path which allows electricity to flow from an area of higher voltage to an area of low voltage.
- Series & parallel configurations
- Ohm's Law V=I*R
- Watt's Law W=I*V
- Short Circuits (BAD!)



AC/DC

- There are 2 types of electrical currents. Direct Current, discovered by Edison, moves in one direction. This is used in batteries and solar panels. Alternating Current, discovered by Tesla, switches directions and is used in the national power grid.
- Inverters are used to switch from DC to AC.
- Rectifiers are used to switch AC to DC.
- Do not directly attach AC and DC supplies and loads without the use of the proper hardware.

Safety

- DON'T CONNECT ANYTHING TO A WALL OUTLET (unless you really really know what you're doing).
- In larger solar power systems fuses should be used to protect components.

Solar Art - July 2017

Alex Nathanson | alex@alexnathanson.com | www.eforaging.com

- Never mix different battery types (AA, AAA, etc.), different brands, or different capacities in a single charger.

Overview of solar panel/ solar powered art and design

These are some common, but not exhaustive, categories of solar design.

Industrial/ Scientific
Aesthetically interesting designs that weren't necessarily intended to be aesthetically interesting.
http://gizmodo.com/solar-panel-is-a-glittering-blue-mosaic-against-the-bla-1740209995

Architectural/ Infrastructure
This would include skyscrapers, large scale solar farms, and incorporating solar panels into other existing infrastructure such as street lights.
http://futuristicnews.com/photovoltaic-spin-cell-cones-will-bring-up-to-20-times-more-electricity/

Functional Solar Panel Mosaics
Functional solar panel mosaics
http://www.alexnathanson.com/solarmosaic2.html

Speculative/ Sci-fi
Non-functional solar panels that are imagining a different future. This work can take the form of physical objects or renderings.
http://www.designboom.com/art/tomas-saracenos-solar-bell-floating-sculpture-takes-flight/

Wearables
https://www.voltaicsystems.com/solar-backpacks?smartphones

Solar Powered Art
Nightlight (curated by Alex Nathanson and Carina Kaufman-Gutierrez)
http://www.nightlight.xyz/

Solar Powered Autonomous Kinetic Sculpture
http://www.smfr.org/robots/

Kinetic Solar Sculpture

- https://vimeo.com/196763006
- https://www.instagram.com/p/BWnrbSqljaM/?taken-by=alexnathanson
- Materials
    - Cardboard
    - Solar cells
    - Hot glue

    - 3V DC motor
    - 22 gauge solid core wire

Solar Mosaic

- www.alexnathanson.com/solarmosaic2.html
- Materials
    - Acrylic
    - Silicone sealant
    - Solar cells
    - Diodes
    - Solar tabbing wire

Additional Resources

http://www.eforaging.com

Bio

Alex Nathanson is a multimedia artist, engineer, curator, and educator whose work spans electronics, video, sound, and performance. He is particularly focused on reimagining and expanding the applications for solar power. He performs regularly with his multimedia project Fan Letters. His collaborators include Dylan Neely, Kid Millions, Carina Kaufman-Gutierrez, Kendall Williams and others. His artwork has been featured at the Museum of the Moving Image (New York, USA), Film Society of Lincoln Center, Anthology Film Archives (New York, USA), PS122 Gallery (New York, USA), Dome of Visions (Copenhagen, Denmark), and the Art Prospect Festival (St. Petersburg, Russia), among other venues. He was one of the long-term artists in residence at Flux Factory, in Queens, NY from 2012 to 2016. Most recently, he was awarded a residency at The Watermill Center to develop a full length opera, titled Autocomplete, in collaboration with Fan Letters. As an educator, he works with students as young as 7 to graduate students and working professionals, teaching skills related to sound, light, mechanics, and electronics through creative projects.
www.alexnathanson.com
www.fanletters.info
www.eforaging.com