

LIFE IN 3D: Mechanics/Electronics and Software of 3D printers

SUMMER 2018 • June 25-28 8:30-12 Daily Eastern Oregon University, Ackerman • La Grande, OR 97850

Inviting Students • Entering Grade 8 through High School to explore...

A Two-Dimensional Plotter Model

Solder a battery power supply

Test Motors: Test DC motors for torque/determine operational voltage. Read current draw Build an Arduino-controlled simple plotter model

Control Systems

Speed Control: How to use a transistor to control a motor Timer Circuits: Using the

555 Resistance/Capacitance: Dynamic impact of R/C on 555 pulse Ohmmeter: Measuring resistance Counting/Decoding circuits: 4017 CMOS Counter/Driver

Actuators and Interfaces

Testing Actuators: Using CD/VCR actuators Stepper motors: Testing and

identification Sequencing: Understand how to drive stepper motors with microprocessors

Software: C++ programming basics to control Arduino outputs

1D, 2D and 3D Systems

Printers: Take apart a printer and test the motor/driver 3D Printing: Learn the mechanics, electronics and software. Print your design.

Limit: 16 Students. Cost: \$20.00 per student (includes materials they will take away from the workshop such as print materials, components, soldering iron, circuits, Arduino)

Requirements: Students should have good manual dexterity to use tools, be able to read and follow detailed instructions, and be able to work with others. The workshop is designed to provide students with practical knowledge about how to build circuits and control systems as well as technological understanding of how more complex electronics operate. Self-paced, web moderated, personally mentored.

Contact: mjaeger@eou.edu for details or see the workshop at:

<https://sites.google.com/a/eou.edu/stem-stories/life-in-3d>