

Teaching Computational Thinking with 3D Printing

Jay Summet
jay@summet.com

Class outline:

- 9:00 am **Introductions & Overview**
- 9:15 am – Tour of 3D printers (Makerbot Replicator 2, RepRap Prussa Mendel, Deltabot)
- 9:30 am – Complete work flow demo: From design to printed object
- 9:45 am – Q&A Session & Break

- 10:00 am – **Teaching Computational Thinking using Parametric Design Software (No Printer Required!)**
 - Software Installation
 - Teaching Computational Concepts with OpenSCAD
 - Variables & Expressions
 - Conditionals & Iteration
 - Transformations
 - Modules (user defined macros)
 - CSG Functions
 - Union
 - Difference
 - Intersection
 - Demo of advanced topics

- 11:00 am **OpenSCAD Practice: Design your own object**
- 11:45 am – Print an object

- 12:00 pm – Lunch Break, unstructured Q&A, and printer watching

- 12:45 pm – What do you do when the printer is finished?

- 1:00 pm **Using 3D printing in the classroom**
 - Assignment Example
 - What if you don't have a 3D printer?
 - External print / manufacturing services:
 - <http://www.shapeways.com>
 - <http://www.sculpteo.com>
 - <http://i.materialise.com/>
 - (Laser & water-jet cutting: <http://www.bigbluesaw.com/saw/>)
 - Wrap up and final Q&A

- 1:30pm – Unstructured time to play with 3D printers, ask questions,