Making 3D Printer Using Junk: Everyone Can Make!

Park, Geunyong (School: Municipal Budget General Educational Institution "Lyceum No.22 "Nadezhda Sibiri")
Lim, Juhwan (School: Illinois Mathematics and Science Academy)
Lee, Jigang (School: Southeastern Junior/Senior High School)

In this project, we conducted three prototype 3D printer models to create a 3D printer that anyone could make using scrap materials available around them. The first model utilized waste resources, such as scrap metal and wood, for the structure of the 3D printer, and then applied the fun factor of junk art to address the public perception that it is expensive and difficult to use. However, the consistency of available waste resources varies from place to place, making our original idea difficult to reproduce. We started to make second model to solve that problem. We used PVC pipes instead of conventional aluminum for the frame. PVC is light and durable similar to aluminium. In addition, we standardized and modeled the connecting parts of the printer into files that anyone can download and print. But ultimately, if you do not have a 3D printer, you can not manufacture the 3D printer for the second model because you can not print connecting parts. Therefore, in third model we have searched for materials that can be easily found and used, and decided to use cardboard boxes(Banana Box). We designed the template and made manual to be simple to follow with minor alterations and minimal cuts to a standard banana box. In addition, we designed a replacement part for a vital but expensive component, which reduced material costs by a factor of 10. The ultimate goal of our project is to make it easy for anyone around the world to simply create and use 3D printers that are similar in performance to store-bought ones, using recycled materials and our own parts.