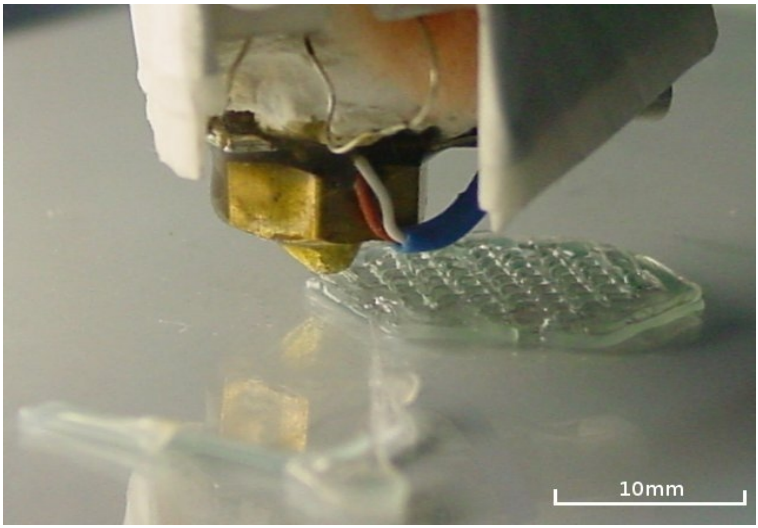
RepRap

http://reprap.org

Look at your PC setup. Imagine that you could hook up a 3D printer to it. Instead of just printing out bits of paper

One of the first prototype RepRap machines

this 3D printer makes things, given a description of what the things looked like. You could make lots of useful stuff, but interestingly you could also make most of the parts to make *another* 3D printer. You would have a machine that could copy itself.



RepRap printing a test hexagon

RepRap (Replicating Rapid- prototyper) is a project to design and to make just such a machine and then to give it all away free on the web. So, anyone who has a RepRap machine can make useful stuff, and can also make copied RepRap machines for their friends.

If you were to go shopping today you could buy 3D printer that couldn't copy itself for about 20,000 EUR.

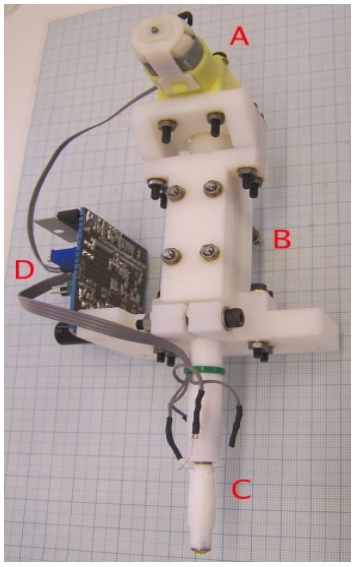
The first RepRap machines won't be able to make quite all of their parts – you will have to buy a few extra to add on, like standard electronic chips. Our target is that all those extra parts will cost no more than 500 EUR. So take those parts, a couple of kilograms of plastic, and your time – and you have a RepRap machine!

RepRap for the technically- minded

RepRap will make things for you using Fused Deposition Modelling (FDM). To visualize the way FDM prints things think of a chef decorating a cake with an icing syringe.

The difference is that a RepRap 3D printer uses molten plastic instead of icing, and the syringe is moved about automatically by your PC. The nozzle is moved to form the bottom layer of the object to be made. Then it moves up and forms the next layer, and so on.

But why is a RepRap so much cheaper? It's simple. A plant seed is more complicated than any machine ever built, but it costs virtually nothing because it can copy itself. So can RepRap.



The picture on the left shows RepRap's plastic- extruding FDM write head. (A) is the drive motor, (B) is where the plastic gets pushed into the heated nozzle, (C) is the nozzle, and (D) is the control electronics. Almost all of the write- head's parts are made using FDM.

The plastic we will use to start with is called polycaprolactone. This is about as strong as nylon, but it melts at 60°C. However, we hope to move on to use polylactic acid. This melts at a rather higher temperature, and (like polycaprolactone) it is

fully biodegradable. But it is also easy to make by fermenting starch (potatoes, maize etc.), so RepRap users would be able to grow their own plastic. The RepRap machine would make the fermentation device, of course.

Okay, so you can make plastic things. Let your kids loose with a RepRap and see what kinds of toys they make. Think of all the ideas that you've had over the years and never built because you didn't have a workshop, or if you did you didn't have the proper tools. No longer. RepRap will let you set the artist and designer in you free in ways that haven't been possible before.

It gets better though. The RepRap team is making another extruder that can lay down electronic circuitry integrated with whatever you're designing and printing out. Once it's done you plug in the appropriate chips and motors and you're good to go.

The RepRap team could tell you about wonderful things that a RepRap could make for you for weeks. And when RepRap is released people will start putting lots of designs for it to build on the web for you to download. But the point of a RepRap 3D printer is that you can have your own dreams and turn them into realities.

Our target date for the first fully-working RepRap machine is 2008. The world will never be the same.

Keep in touch. If you want to help, we always appreciate donations to let us buy parts that we can't make with our RepRaps ... YET!

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