New Technology Ideas for ISR
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Topic Overview

• Micro computers
• Embedded electronics
• 3D printing
• Unusual materials

This document has been modified with additional web links
The 25 dollar computer

Raspberry Pi

I have ordered one and I am scheduled to receive it shortly and will do a short demo in the future with the help of the ISR Linux admins

Size 85.60mm x 53.98mm x 17mm
Model B has 256Mb RAM, 2 USB port and an Ethernet port

**Temp ranges**

**Chip types**
- LAN9512 0°C to 70°C (32°F to 158° F)
- AP is qualified from -40°C to 85°C. (-40°F 185F)

**Power requirements**
- 5v micro USB.
- 4 x AA cells.

**Storage**
SD card 4Gb or more

**OS distributions**
Fedora, Debian and ArchLinux

[Breadboard for the Raspberry](#)
What is Arduino?

http://www.arduino.cc/

Arduino is a single-board microcontroller and a software suite for programming it. The hardware consists of a simple open hardware design for the controller with an Atmel AVR processor and on-board I/O support. ...
Some of the many uses for Arduino and the shields.

**GPS devices**

**Servo control**

**Data logging**

The current count (may 7th 2012) on different types of shields are 280. Here is a [link](#) to some of the more popular ones.
3D printing

[Link for the 3d printer I have trained and have shared access on]

[Link for the DYI RepRap 3d printer]
3D printing

Printing demos
http://youtu.be/3eojAdYMT0g Making a machine
http://youtu.be/h6ozSqs3lfw Gears very complex
http://youtu.be/LiK73ekyDEw Abstract 3d Model
What is Sugru?

Sugru is the exciting new air-curing rubber that can be formed by hand. It bonds to most materials and turns into a strong, flexible silicone rubber overnight. Developed by a team of product designers and materials scientists, sugru’s patented technology is unique in its combination of hand-formability, self-adhesion and flexibility when cured. It feels like modeling clay, and it’s that easy to use too. Once cured, its durable properties mean it’s comfortable in extreme environments from the dishwasher to the ocean to Antarctica.
**Hand formable**
sugru can be formed and shaped by hand for up to 30 minutes once it has been removed from its packaging.

**Sticks to almost anything**
sugru is designed to stick to as many other materials as possible. It forms a strong bond to aluminium, steel, ceramics, glass, wood and other materials, including some plastics like perspex and ABS and rubbers like silicone and butyl rubber.

**Air cures at room temperature**
sugru is like modelling clay when you take it from its pack. Once it’s exposed to air, it cures to a tough flexible silicone overnight using the moisture in the air. Working time = 30 mins. Cure time = 24hrs (3-5 mm deep)

**Strong + durable = great outdoors**
sugru is strong and durable. Once cured, it will also stand up to anything the weather throws at it, wet or dry, hot or cold. It will be great. It also won’t fade in the sun and it’s fine with sea water too!

**Flexible when cured**
When sugru cures, it’s flexible rather than rigid. Which means that you can repair things that need to be able to move like textiles, cables, or shoes. It’s also electrically insulating—how awesome is that!

**Soft touch & grippy**
As sugru is a silicone rubber, it feels soft to touch when it has cured, but is also grippy. This makes it perfect for handles and grips as it is comfortable but non-slip.
Stable at High and Low temperatures

Sugru is resistant from -60°C to +180°C. It gets hot and cold but it won’t get softer or harder or melt.

Waterproof

Once it’s cured, sugru is pretty much like other silicones – so it’s completely waterproof. It’s easy to clean with soap and water, and it’s durable in the harsh conditions of your washing machine and dishwasher, and even in the sea.

Removeable

Once cured, you can remove it with a craft knife and then remove residue with fingernails and tissue paper.
Solar domes and towers

Designed for outdoor sensing and wireless devices. Due to hemispheric shape, these modules yield energy earlier in the morning and later in the evening than flat one.

3D solar towers offer up to 20 times more power output than traditional flat solar panels.
Antenna in a can

Tools and access

- Professional 3D printers
- Welding shop
- Machine shop
- Electronics lab

The membership costs are very reasonable for Artisans Asylum and after some shop training classes we can gain access to professional grade shops. I am currently taking the courses on my own. We can even rent space (depending on availability) for longer projects.
Thanks for your attention.

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