Diabologic: Siftables
by Frank Dolinar

About a year ago, I mentioned the TED organization and its website. From the first day I saw it and some of the inspiring videos it has made public, I was hooked.

TED stands for "Technology, Entertainment, and Design", and its tag line is "Ideas Worth Sharing". It may initially seem, to some people, that technology, entertainment, and design are an odd collection of things to put in one basket. But it makes perfectly good sense once you've decided to spend an hour or so perusing a handful of the presentations. Certainly BMW was convinced, to the point that it underwrites the cost of making these videos available to the public. (I'm convinced that BMW automobiles themselves are a good intersection of what TED stands for.)

If you are not aware of the TED organization, its annual awards (the TED Prizes), and its astonishingly informative website (http://www.ted.com), I recommend that you visit the site at your earliest possible convenience. I'll wait…   See! I told you so.

After nearly a year and a half of returning to the website, it continues to grab my attention.

My latest find at TED is the just released (in mid-February 2009) presentation by David Merrill, a graduate student at MIT's Media Lab. David and his colleagues have produced a collection of smart, cookie-sized, spatially aware computer modules, called "Siftables", that interact with one another. Each module can perform a very limited and very simple set of human selectable tasks. The modules also have more generic programming that allows each module to know when it is next to another module and to determine how they might interact.

You might wonder what a simple little device, barely larger than a fig newton, with no keyboard or other obvious input device, and minimal programming, could possibly be used for. You'd be surprised.

Today, few people who simply use computers (as opposed to geeks like me who program them) know that they are just a complex collection of on/off switches.

But I do know, and the "Siftables" presentation got me thinking.

First, I thought of Spencer Brown's book Laws of Form. With a bare handful of axioms and symbols, it provides the tools to handle and make sense of formal logic and Boolean algebra.

Second, I thought of Conway's game of "Life", one of the first very simple computer games. The rules for Life were very simple indeed. They had to be, since it initially ran only on computers with text based terminals. Here's how it worked:
- The game was played on a grid.
- You entered a pattern of Xs on the grid and then started the game.
- Each grid square had a total of eight neighbors.
- At each iteration **all** of the squares on the grid were evaluated according to these rules:
    1) if a square had zero or one occupied neighbors (squares with an 'X'), it had insufficient support and was set to blank;
    2) if a square had two or three occupied neighbors and was blank a new X was created and if it was not blank the existing X remained;
    3) if a square had more than three occupied neighbors, it was too crowded and was set to blank.

The patterns created were often complex and the goal was to develop a pattern of Xs that could sustain itself rather than disappear.

Third, I thought of Jeremy Campbell's book <u>Grammatical Man</u>, which among its other topics deals with how complexity can arise from simple components working together, which in many ways is the essence of how computer programs are developed.

I encourage you to take a look at David Merrill's presentation and prepare to be amazed. (http://www.ted.com/talks/david_merrill_demos_siftables_the_smart_blocks.html) These tiny little computers that interact with one another to form smart networks that can store images, do math, and create music together may be the leading edge of a new paradigm for how humans and computers can interact.

[Expanded versions of many Diabologic columns are available at http://www.nanosteps.net/nsDiabologic.html]