I'm Chris Grossack, and I study the geometric structure of certain groups of functions. By this, I mean I have a bunch of functions that I carry around with me (who doesn't?) and I want to position my functions around me in a way that makes sense (So randomly putting functions all over the place is not helpful, I want to be meaningful with where I put things). I then want to use the geometric structure of where the functions are positioned in order to better understand the functions themselves.

If you'll indulge me, as a mathematician I feel obligated to say big words, so I'll need to give some definitions. However, as a mathematician, I almost never get to have as much fun with how I present definitions as I like, because it's not "serious" enough. I will try here to simultaneously have fun, while still explaining what is happening.

Definition: A *binary string* is a (possibly infinte) sequence of 0s and 1s. 01101110011001010111001001100100, for instance, is a binary string.

Definition: If I have a bunch of functions, this collection of functions is called a *Group* of functions if it satisfies the following bonus properties:

1. There is a fancy function called I (for identity) so that
   for every x, $I(x) = x$.
   I is the "do nothing" function, and it is in our collection.

2. For any two functions in our bag, f and g there is another function called $f + g$ which is also in our bag. Here, $(f + g)(x) = f(g(x))$. We also ask that addition not behave stupidly.
   Namely $(f + g) + h = f + (g + h)$, and $f + g = g + f$.

3. For every function f which is in our bag, there is another function in our bag (which I will suggestively call $-f$) such that
   for every x, $f + (-f) = (-f) + f = I$ (that is, $-f$ undoes f).

Now, to preemtively stop certain kinds of mathematicians from trying to revoke my Math Card$^{\text{TM}}$, I am aware this makes us an *Abelian* Group, and is slightly less general than a regular group. To those who care, I kindly ask you to get over it.

There are lot of ways to define functions which are slightly more involved than the standard definitions. For instance, here are the objects which create the functions I study:

Definition: A *Finite State Automaton* is a machine like the ones shown below: