Okay, so my name is Steve Bond and I’m going to take you on a brief tour of a website I’ve created. It’s called Evopix, and my intent is to develop it into a game and in-class teaching tool. The original motivation behind Evopix, was a need that I saw for a popular application that demonstrates evolution in an intuitive and engaging fashion, such that learning occurs almost passively, while focusing on replay and retention value. The goal here would be to demonstrate the central concepts intrinsic to evolution, these being heritability, mutation, unequal survival, and the cumulative effects of these processes over successive generations. Evopix is currently in a very preliminary state, with only a basic user interface that I designed for the purpose of a small private beta I conducted prior to this proposal. I have however created a demo account if you would like to see the site for yourself.

The login being demo, and the password is also demo. And from the welcome page here, I’d like to introduce you to my friend Bob.

Bob is a Scalable Vector Graphic (or SVG) picture that I strained my considerable artistic talents to draw, and he has the distinction of being the very first evopic. There is a genome file associated with bob that looks like this:

This here describes the mathematically defined path of Bob’s body, with each of these ‘t’ values describing Bezier curves and the control points between them. Here we have several properties that determine the color of the body path, and this last bit here describes the properties of the line that surrounds the body. And if we look down here, we have eye and pupil, and finally the mouth. This is the heritable and mutable material passed on to Bob’s offspring, and is used to create the final SVG that web browsers can render into a picure. This coincidentally creates a nice parallel between the organic DNA to protein relationship, and could be used to illustrate genotype/phenotype interactions.

Regardless, let’s get back to Bob. I copied Bob’s genome to create a second identical evopic (I called it Sue), and I placed them in my farm.

Now if we select Bob and Sue for breeding, we can create some offspring. You’ll notice that they all look very much like Bob and Sue, but some of them have acquired a mutation. We can then select these new offspring for the next generation, and you’ll notice that the mutant traits are retained. If you remember back to the genome file, and the Bezier curves that make up the body paths, what I’m doing here calculating a weighted average between each point that differs between the parents, and that weighting is randomly assigned at run-time to ensure every offspring is unique, while still retaining the character of its parents! Undoubtedly you can already envision the logical progression that will follow if many users create many offspring, but let me show you some of the results from a one month beta testing session.

We can go hunting for wild evopix here, and look at some of the various body plans that have evolved. We can also grab a couple of them and put them in our farm, to better illustrate the breeding algorithms.

So if we breed two more distantly related Evopix together, you can get a better idea as to how the offspring are a mixture of their parents. As you can imagine, some fairly interesting things have happened when breeding in this way, but there comes a point where evopix become to distantly related to breed any more. For example these two are simply incompatible. Not to say of course that they couldn’t be run through the breeding algorithm to produce offspring, but I’ve created a similarity index that is calculated between potential parents, and set a threshold below which breeding is blocked. This is how the concept of speciation is introduced, and will be a defining feature of the social interactions we plan to integrate into the game.

I’ll just quickly take you to the farms of some of the other beta testers, to give you one more look at the diversity that was generated within a month. This first person Really flattened Bob out. Here, let me zoom in so you can see everything at once. Kind of starting to look like a slug. This next person, it was my sister actually, was really proud of this little creation. She thought it looked like a bird.

This one really collected a menagerie. This gives you a pretty good feel for how much change occurred. Evopix do die off in the wild as others are bred, so it can happen that a player has the only example of a given species, and there are some species that have simply gone extinct. This last person really took the selective breeding to the next level. He named this his Picasso.

So to finish things off, I also have a semi functional genealogy tool, that lets people track back through the generations to see the lineage of their pets in relation to Bob, since he is the common ancestor of all the evopix I’ve shown you today, but the plan is to modify this significantly. Ideally, a user will be able to click on any given evopic, and watch a smooth video transitioning through all the descendants of Bob that ultimately gave rise to that very evopic.

So there you have it! I would very much like to turn this concept site into a full featured social web game for the public, and to also use it as a classroom learning tool. I think with the support of BEACON, this dream could easily become a reality, and I sincerely thank you for taking the time to consider my proposal.