

# XML and Gender Implementation

[https://github.com/keshavd/VBD\\_Sim/commit/23a9a475ed41ee9eb51915ee4b6e59c87135eb8b](https://github.com/keshavd/VBD_Sim/commit/23a9a475ed41ee9eb51915ee4b6e59c87135eb8b)

I performed multiple small tasks to complete this assignment.

The first thing was go through each of Java classes from the project and wrote out a tree of how each of the constructors were being used by the different classes to understand how the project worked.

After I mapped out the flow of the application, I found that majority of the simulation's characteristics (humans placement, environment, mosquito density etc.) were formed via the world class's constructor. This constructor passes variables to the environment constructor and also uses Poisson Probability to designate humans to their location on the lattice. Because of this I focused the XML configuration file on customising the world constructor.

In creating the XML file, I used the same variables names as found in the Java application as element names and added attributes specifying their data type. Please see attached config.xml.

I added XML parsing to the DiseaseGUI.java because that is where the world constructor is called. I performed XML file reading in the same way as demonstrated in class (Using a DocumentBuilderFactory). I had initially tried to use DOM to navigate the node tree and pass the constructor a NodeList but I was finding 'null' artifacts when fetching nodes. I also had trouble trying to get by 'ID' via 'getElementsById()'. I would have needed to setup a 'schema' in my DocumentBuilderFactory in order for my ID attributes to be treated as 'ID'.

I found an easier method using the class called "XPath". XPath uses path expressions to extract the text from the XML document. It was more straightforward and resulted in direct results with no nodes or elements to deal with.

I also added the field 'genderRatio' to the World Constructor. This will take a ratio of male to female as a probability and assign genders to the instantiated humans based on a randomly generated number via Random().nextDouble().

I modified the Human class, added a string attribute called gender. I modified the default constructor to fill this gender attribute to 'NA' when not assigned. I also added a new constructor that will take a string as the gender value. I used this gender included constructor when instantiating humans in the World constructor.

It was a lot of fun working on this alternative assignment. If given the opportunity, I would love to continue development on the project. I would have liked to add age groups to humans given the reduction in immunity over time I read about in one of your papers, but my idea for implementation was only have baked. I also added a variable in the XML called InnateResistanceRatio. I had wanted to add innate immunity to the simulation; it seems like an easy switch via the Disease state but I did not have enough time given the trouble I had with DOM.

Thanks for fun last assignment and showing me the potential with Java.