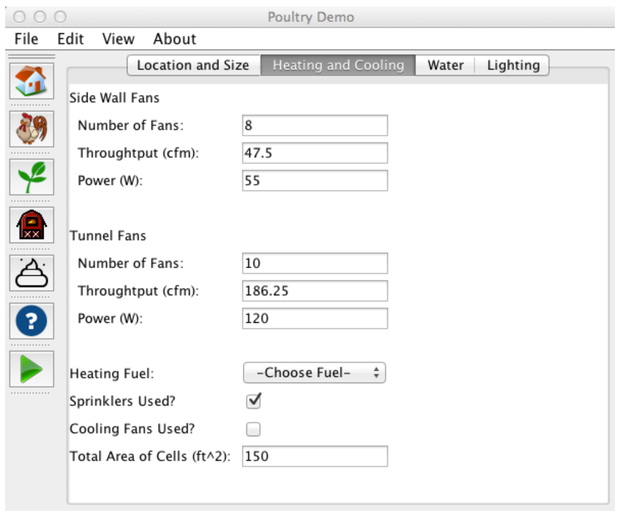

UNIVERSITY OF ARKANSAS

Environmental Footprint Calculator for Poultry Producers

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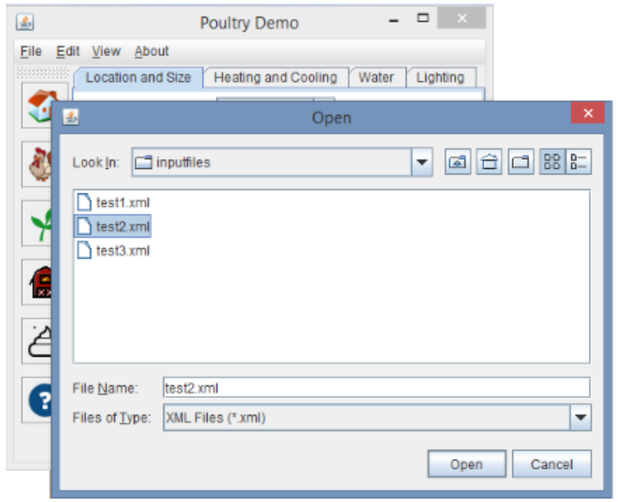
April 28, 2016



Objective

Our team worked with the University of Arkansas Office of Sustainability to co-develop an application which allows poultry producers to enter and save bird, feed, facility, and waste management data pertaining to their particular operations to calculate projected outcomes in physical growth, energy efficiency, profitability, and environmental impact.

Problem

Poultry Production is a business where income comes from a very small margin of profit per bird multiplied by thousands of birds per house. Staying on top of all of the variables that go into poultry feed, facility costs, and environmental impact is a growing task that is hard to optimize with paper and pencil.

Potential Impact

Being able to more accurately foresee the relative impact and importance of various production decisions allows producers to allocate money in the areas that it will return the most from, whether that means feeding a more expensive but nutritious feed or lowering the temperature by an extra five degrees in the summer.

Requirements

- Have a look and feel that matched whatever native OS it is running on.
- Utilize XML for data passing between our team's GUI and the Office of Sustainability's computational engine.
- Be user-friendly enough to be used in real-life.
- Be commented and documented well enough for other people to continue the project and use the code in the future.

Interface Design

Main Windows Accessible from the Toolbar:

- Home/Welcome
  Displays any pertinent messages to the user and provides a way to load a project, start a new one, or view the tutorial.

- Inputs
  Bird Input
  Feed Input
  Barn Input
  Waste Management Input

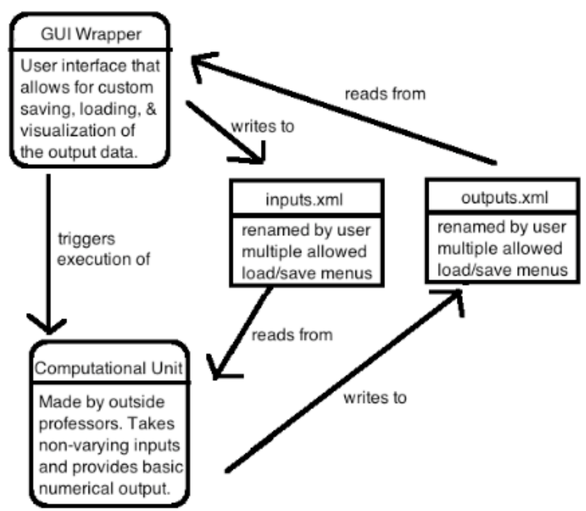
- Help/Tutorial
  A guided walkthrough ensures that the learning curve for the program is as minimal as possible.

- Trigger Execution/Outputs
  This is where error checking is also performed.

Additionally, the interface has loading/saving functionality mirroring that of general OS-based file choosers, allowing for files to be loaded from and saved to any places in the files system, including USB.

Architecture

The main components are the GUI, which our team has made, and the computational engine, which is still in development. The figure below shows all of the interactions that have to happen between the two components. Directly, the only interaction is when the GUI triggers the computational engine. Indirectly, data is passed through XML files both ways.



Lessons Learned

- Clean code is far harder to make when working in groups!
- It takes work to translate a client's (sponsor's) desires into programming specifications.
- Probably more than half of the work in programming is not actually programming, but researching how to program the next task we have.

Future Work

The computational model is still in development, so immediately after the completion of that work, whoever continues developing the GUI will be able to integrate the two components, which includes triggering the computational engine from the GUI and gathering the results from the corresponding XML file.

Key Personnel

Heather Sandefur- Our primary contact with the Office of Sustainability. A recent Masters graduate, she works with multiple environmental projects sponsored by outside groups.