

sjs334

Sarah Sinclair's Individual Contribution Page

Spring 2016 Contributions

- As Design Lead and program manager on the Plant Operations Smartphone Tracker (POST) team, I will work with a small team of developers to create and iteratively refine upon an app that facilitates data collection from AguaClara plants in Honduras. Current data collection efforts rely upon operators' sending a specifically formatted text message each day, and are not reliable, both in frequency and in quality of data. The POST team will simplify this process through the creation of an Android app, which will additionally offer data visualization, trend predictions, and Bluetooth interfacing with turbidimeters to add value to operators. As a part of this team, I will work to manage feature lists, timelines, and team expectations, while contributing to wireframes and feature specifications to ensure our designs adequately meet the needs of Honduran plant operators. I will lead an interview-based feedback collection process with field engineers and plant operators in order to improve the quality of our product. I will lead field tests using smartphones deployed to Honduran operators as a part of this process.

Fall 2015 Contributions

- Again as a part of the Water Treatment Technology Selection Guide team, I made significant progress in making the site scalable and accommodating to various constraint options necessary for decision logic. I enabled the sharing of site results via a permalinking process, and incorporated a variety of features such as cost regression visualization, as well as the division of contaminants into dynamic groups based on the type of input data they require. I focused my efforts on scalable extensibility of the site through an administrator panel, enabling admins to manipulate constraints and user data, while decoupling much of the existing site from hardcoded input fields. The website is instead capable of flexibly drawing from the database in order to accommodate new and different types of inputs.

Spring 2015 Contributions

- Continuing on the Water Treatment Technology Selection Guide team, I worked to design and implement a cohesive results page for the recommendation web tool, translating wireframes into a functional tool. I improved the mechanism by which data is passed between pages of the tool and worked to ensure all included fields were meaningful and fully functional. I contributed to ongoing work in the realms of style and functionality, and configured and deployed the site live to the AguaClara server.

Fall 2014 Contributions

- As a part of the Water Treatment Technology Selection Guide team, I contributed to the development of an interactive tool which educates users about the different water treatment technologies available to them. I engaged in preliminary literature review surveying potential treatment options before designing the layout of a clean, modern, multi-page website built to provide treatment recommendations. I coded the stylesheets for the website in CSS, implemented form functionality using PHP and HTML, and worked to improve user interactivity with liberal use of JavaScript. Great consideration was given to minimizing user memory load and to making form inputs accessible to those without technical knowledge. I began preparations to deploy the site live on the AguaClara server, and worked to set up MySQL databases that will be used to log user input. Throughout the semester, I paid special attention to user experience, implementing features like parallax scrolling, maintained scroll position between pages, and pre-populated user inputs when users revisit site pages.

Spring 2014 Contributions

- Continuing on the Low Flow Stacked Rapid Sand Filter subteam, I worked to finalize the construction of the 12" (30 cm) diameter filter begun last semester. We succeeded in having the filter up and running by the end of the semester. This involved designing a sand drain, slotted manifolds, and pipe stubs, as well as a method of recycling water through the plant so it could be run continuously. I contributed to the design and machining of the slotted manifolds for the filter, and worked to machine and install valves for the pressure sensors that were inserted into the side of the main filter column. I assembled the backwash pipe for the filter and helped test the column for watertightness. I generated a design for the sand drain and helped the team transition from fabrication into testing by introducing measures like secondary containment. Towards the end of the semester, I assisted in testing the filter, and helped succeed in initiating backwash under substandard conditions.

Fall 2013 Contributions

- As a part of the Low Flow Stacked Rapid Filter subteam, I contributed to the ongoing construction of a new, 12" diameter filter that will be used to model LFSRFS currently being built in India. I helped create a simplified, accessible design for the filter hydraulics, and formalized design constraints for the filter through myriad head loss calculations. I helped pioneer a new way of joining filter components using gaskets, stainless steel shim stock, and hose clamps, and applied this method in the construction of a filter column, entrance tank, and exit tank. I led efforts to replace filter inlet and exit piping with flexible PVC, and created a construction method to insert couplings and barbed-to-male adapters through filter column walls. I began construction of the backwash pipe and investigated the uniformity of flow distribution through inlet piping via the flow ratio. I created various schematic diagrams and documented design motivations and procedures that will be helpful when the construction of this filter is eventually replicated.

Spring 2013 Contributions

- As a part of the Small Scale Plant Model team, I contributed to the construction of a portable, scaled model of an AguaClara plant that will clearly represent AguaClara treatment processes and can be used for educational and fundraising purposes. I was responsible for the creation of the majority of our team's Rhinoceros templates representing flattened plant components. I contributed to the later optimization of these templates, and I compiled three-dimensional composite shots of our model's components in order to facilitate future construction. I also assembled our model flocculator, filter, and filter inlet, and worked to cut out our model entrance tank from chipboard.