ScratchFoot

I am Jordan Doorlag, and this summer I worked on the ScratchFoot project with Professor Norman. The problem we are trying to solve is that when a child is first learning code, it is likely that they will be introduced to it in a highly controlled, drag-and-drop style environment such as Scratch. These environments are great because they provide a way to teach some of the fundamentals of programming without having to deal with many of the syntactic complexities that come with a text-based language. However, it can be very difficult to transition from these block-based environments to the "real world" of text-based languages. The goal of this project was to ease this transition with a program that can convert Scratch blocks into Greenfoot Java code. The program consists of two parts: an interface for Greenfoot which allows each Scratch block to match one-to-one with a line of code, and a separate program to convert a Scratch project into Greenfoot code. I have been contributing code to the repository over the course of the summer. This has included me adding support for more of the Scratch blocks, optimising the interface by adding parallelism and more efficient data structures, and improving the long-term maintainability of the code with various design patterns. This research has also benefitted me personally. Throughout my education at Calvin many of the Computer Science concepts I have learned have been taught, by necessity, through abstract and often unrelatable examples. In this project I have been able to utilize these where they are practical solutions to real problems, such as implementing a quad-tree I learned about in my graphics class to speed up collision detection. It has also given me an opportunity to learn about new things, like design patterns and abstract syntax trees. Overall this research opportunity has been a really great experience.