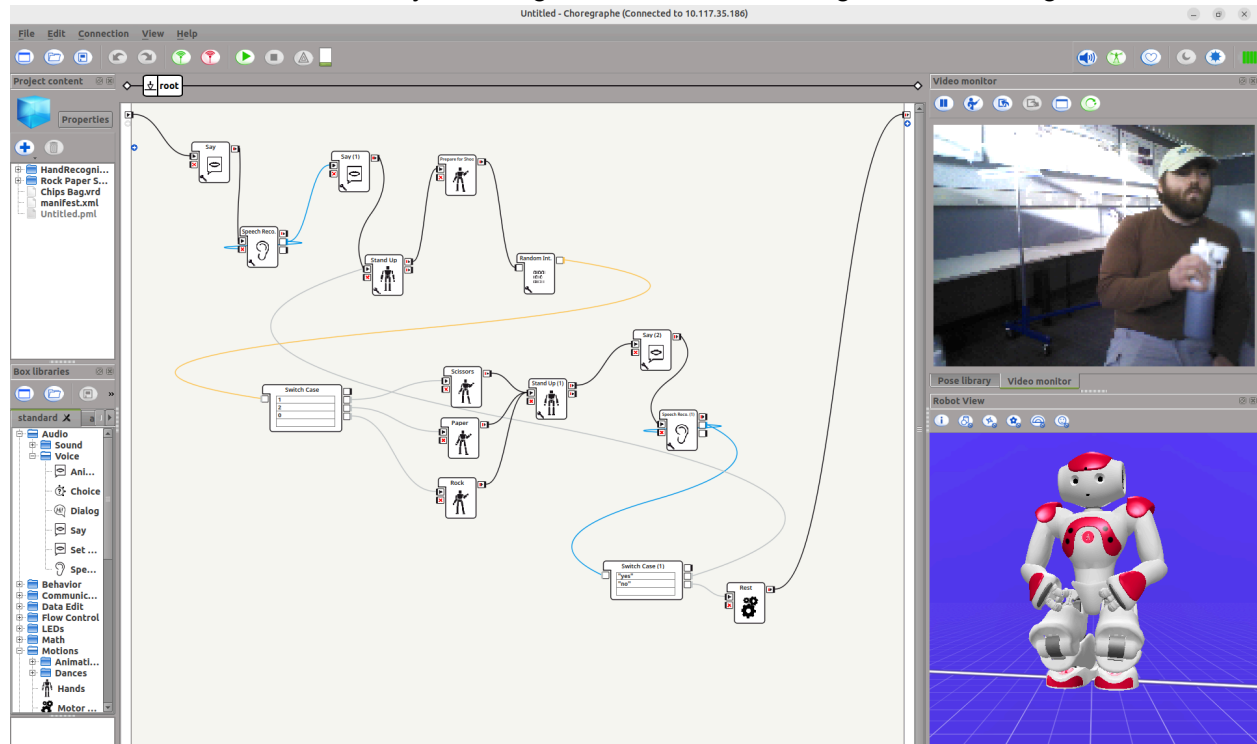


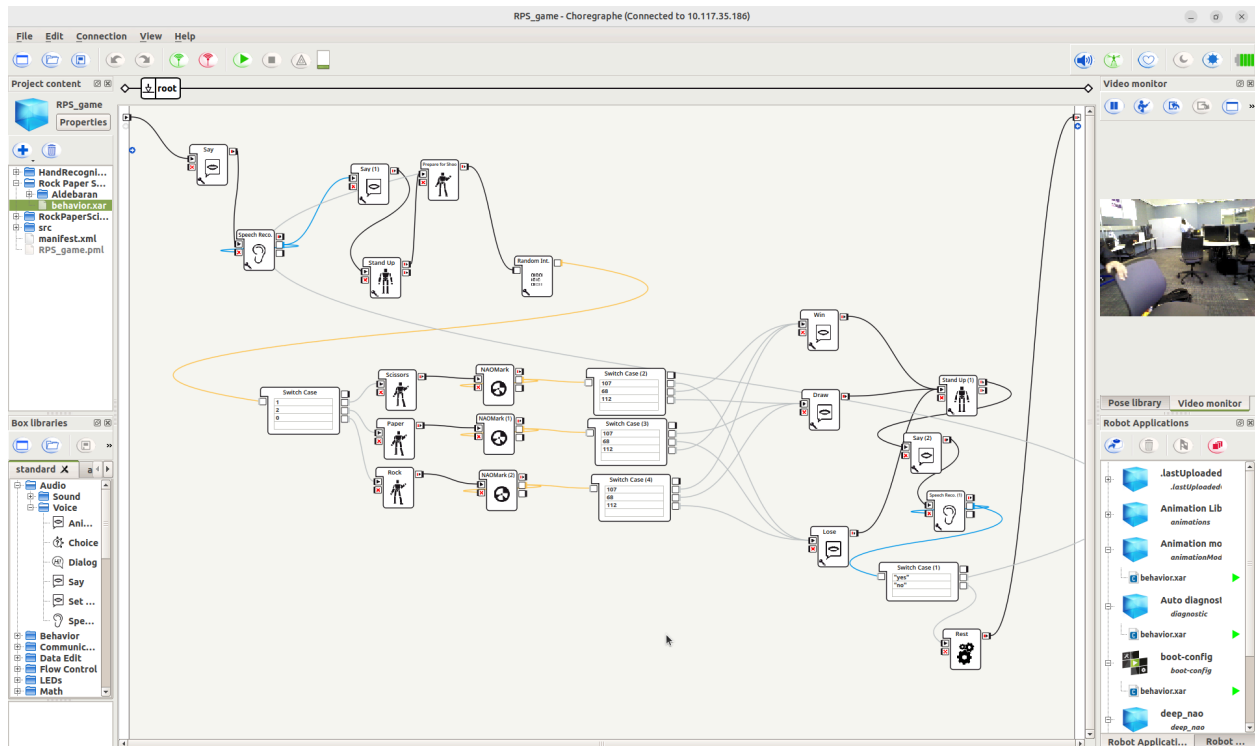
The code inside of Choregraphe works through a connection of code blocks that all perform a specific action. These actions are sequential and work from left to right more or less. The starting point on the left is the small block where the line starts. From there it goes through all of the blocks sequentially until the correct end conditions are met or it checks off all of its code blocks. After this it ends by following the line into the ending block on the right side.



The above code allows for the Nao robot to perform the actions of playing rock paper scissors. The first code block makes the Nao bot say "What game do you want to play?". After this the next block makes the bot listen out for specific words, in this case it is listening for the words "rock", "paper", and "scissors". The next block also makes the robot speak, this time it says "Ok!". The following two blocks are movement blocks and make the robot move to a specific position or perform a certain movement. The first one makes the bot stand up to a default position. The next one is a custom made movement package that makes the robot perform the starting actions of rock paper scissors, making a fist and shaking it up and down. After this the next block generates a random number from one to three. This is fed into a block that takes the input and depending on what number it is sends a signal to a different block. This block will be performed next. The three blocks that it can go to contain custom movement packages for the robot to either throw a rock paper or scissors. Next the following block has the robot ask if the player would like to play again, this is connected to another listening block detecting the words yes or no. Finally it goes to another split block that either sends the signal back to the start if it hears yes or sends it to an ending rest position if it hears no.

The panel on the top right shows the camera that the Nao robot is currently seeing. With this camera view, we are able to use it to make sure that the Nao is seeing what we want during object recognition. The bottom right panel is a scan of the Nao robots movements. We are able

to use this to check movements on the robot. You are able to drag and move the limbs of the robot to create movements.



The above code works very similarly to the other piece of code that we have but it is more advanced and capable of recognizing different patterns. After the initial rock, paper, and scissors movements from the last code there are new blocks added after each of them. These blocks are called Nao marker blocks. They detect specific marker designs that have been specially implemented for the Nao bot. Given a certain Nao marker they return a correlated value and pass it to the next block. This is then passed to another switch block which takes the signal and passes it to one of the three end conditions for the game, this is based on the different Nao marker given and which action the robot throws. The three end game conditions are win, lose, and draw, which each say either “you lose”, “you win”, or “it’s a draw”. After this the signal is passed back to the regular code that asks the player if they want to play again and ends the game if desired.