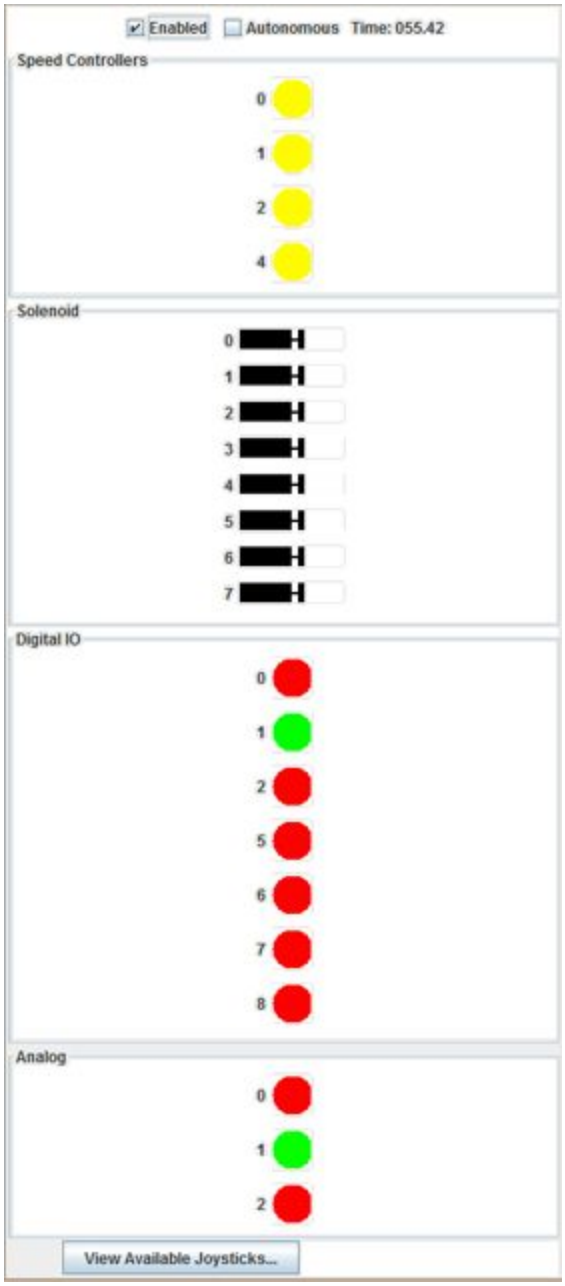
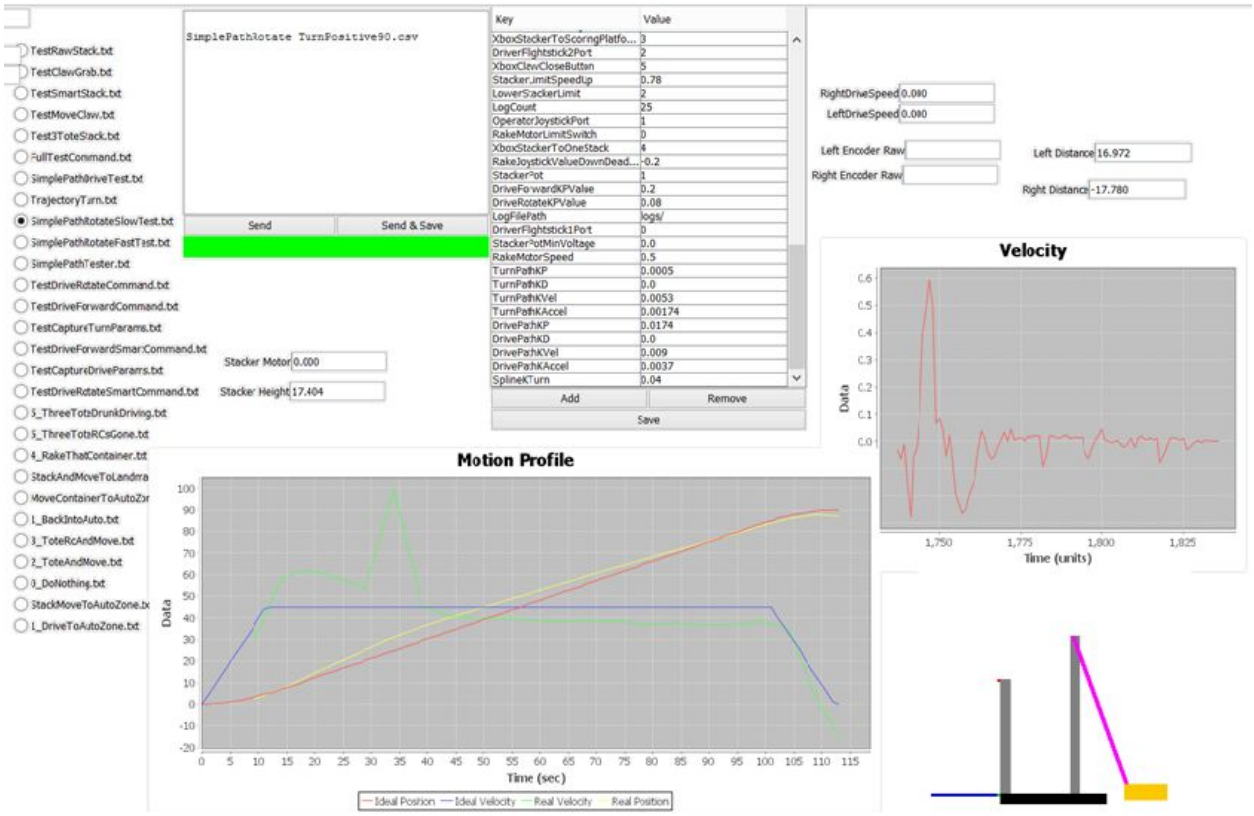
Java Simulator



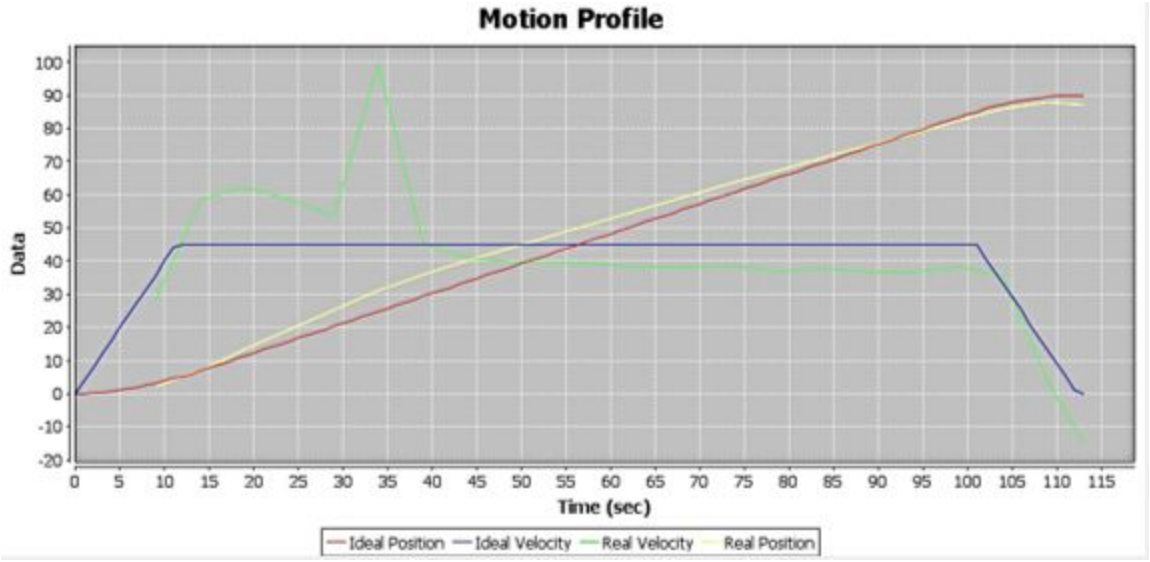
- Stubs out some WpiLib code
- Allows you to test your code without a robot
- Can use joysticks or keyboard as an input
- Extendable so you can customize your own simulators to fit your needs
- Beta tested by our friends on 558

Custom Smart Dashboard Widgets



- Customized widget to view state of robot appendages (arm, stacker, claw)
- View the state of our motion profile driving system. Makes it SUPER easy to tune and tweak
- Can dynamically select autonomous modes from the dashboard
- Can update our auton scripts directly from the dashboard. Saves a TON of time on the practice field.
- All this, plus the built in magic of the SmartDashboard

Motion Profiling



- Offers fine grained control of driving a motor. We use it for autonomous driving
- Select a max velocity, and max acceleration, and a distance. Algorithm will calculate the trapezoidal motion profile
- Use a controller featuring Feed-Forward velocity and acceleration terms, and a PD controller
- When tuned properly, you should know exactly where you will be at a given time, and come within inches of your setpoint.

Props to Ether, Jarad341, AustinSchuh, Paul Copiolli, and everyone else discussing the algorithm on chief delphi

Autonomous Scripting

```
SmartStack 0
SmartStack 2

&MoveClaw true 3
ClawGrab true 3


MoveClaw false 3
ClawGrab false 3
SimplePathRotate TurnPositive90.csv
SimplePathDrive StartingIntoAuto.csv
#SimplePathDrive TurnPositive90.csv
```

- Process
  - Store autonomous “scripts” on the robot
  - On boot, crawl a directory to search for autonomous modes
  - Parse a command name and its arguments to construct the appropriate Command
  - Insert all commands into a CommandGroup, and run it during auton
- Allows for rapid prototyping of modes
- Makes the creation of a new mode very painless
- NO CODE CHANGES (once all command classes have been implemented)