Self Parallel-Parking Car
Illustrated and Presented by Kevin Hsiue and Frank Ni
The big idea:
Parallel parking is usually a pain.
Relevant ideas:
Why this is educationally interesting.
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Required materials:
Building a suitable model.

- 4WD CHASSIS
- 2X XBEE MODULE + ADAPTER
- 4X IR SENSOR
- ADC0804 LM18293
- BASYS FPGA
- BATTERY SUPPLY
Block diagram: Abstracting the challenge into smaller pieces.
Block diagram:
Abstracting the challenge into smaller pieces.

- Mount four sensors in optimal positions
- Use ADC to convert voltage to eight byte hex value
- readSensor module cycles through the 4 ADC
- lets calcDistance know when it is ready
- calcDistance converts the voltages into a distance value

Image courtesy of SparkFun.com
Block diagram:
Abstracting the challenge into smaller pieces.

- genPWM module uses duty cycle input to create PWM
- PWM is fed to LM18293 to control vehicle
- Separate supply to isolate noise

Motor Driver

Image courtesy of SparkFun.com
Block diagram: Abstractiong the challenge into smaller pieces.

- `calcWheelVel` is a feedback controller implemented via FSM
- Use XBee to control the vehicle wirelessly
- Behavior is selected by user
Plan of attack:
Solving a set problem.
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# Timeline

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<th>Week Of</th>
<th>Frank Ni</th>
<th>Kevin Hsiue</th>
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<td>Nov. 12</td>
<td>Interfacing Sensors</td>
<td>Interfacing motors</td>
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<td>Sensor Modules</td>
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<td>Feedback controller</td>
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<td>Dec. 3</td>
<td>System Integration and Testing</td>
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