ECE 540 Project #2 List of Files
(Last updated 20-Oct-2020)

Documentation files	
Name	**Description**
docs\Rojobot31 Functional Spec.pdf	Functional specification of the Rojobot31 external interfaces
docs\Rojobot31 Theory of Ops.pdf	Internal theory of operation for the Rojobot emulator. You do not need to understand this material for Project 2 but you may find it interesting.
docs\project_2_Main_Description.pdf	The Project write-up
docs\Proj2Demo Design Description.pdf	Theory of operation for the demo example. Includes description of the user interface.
docs\Rojobot World Video Controller.pdf	Theory of operation and task list for adding the video controller to your Rojobot system. Your demo will be based on this system coupled with the map that includes left and right turns.
docs\Proj2 Bot tracker.pdf	File showing the simple right-turn-only track for the Rojobot. You may use this file to check that your Rojobot system is running correctly before you have the video controller.
Verilog files for Part 1 (Proj2Demo w/ no video)	
Name	**Description**
fpga_code\hdl_part1\world_map_part1\world_map.ngc	This is a simple world map that includes only right turns. You can use this file to check and/or debug your Rojobot implementation.
fpga_code\hdl_part1\world_map_part1\world_map.v	Instantiates a 16Kx2 bit dual-port ROM, produced by Xilinx *Core Generator*, which holds a map of the RojoBot's virtual world.
Verilog files for Part 2 (Demo with video)	
Name	**Description**
fpga_code\hdl_part2\dtg.v	Generates the video raster timing signals vert_sync, horiz_sync, video_on, and pixel_row and pixel_column, which indicate the current vertical and horizontal pixel position on the screen.

-

World Maps	
Name	**Description**
fpga_code\world_maps/world_map_part1/world_map.ngc	This is a simple world map that includes only right turns. You can use this file to check and/or debug your Rojobot implementation. Copy world_map.ngc to your synthesis directory for the project. The world_map_part1/map directory contains a file called world_map_part1.doc which shows the layout of the track.
fpga_code\world_maps/world_map_lr/world_map.ngc	This is the world map you should use for your demo. It contains both left and right turns. Copy and overwrite world_map.ngc in your synthesis directory for the project. The world_map_lr/map directory contains a file called worldmap_lr.doc which shows the layout of the track.
fpga_code\world_maps/world_map_loop/world_map.ngc	This is a fun map that contains loops but only right turns. You can use it to debug your video logic before you add the video controller to the project. Copy and overwrite world_map.ngc in your synthesis directory for the project. The world_map_loop/map directory contains a file called worldmap_loop.doc which shows the layout of the track
fpga_code\world_maps/world_map_part1/map, fpga_code\world_maps/world_map_loop/map, fpga_code\world_maps/world_map_lr/map	Each of the world map directories contains a directory called map. The map directory contains the text used to generate a track, a .coe (Xilinx coefficients file) that the Core Generator uses to initialize the Block RAM and a perl script that can be used to convert the .txt file to a .coe file. Perhaps the most useful file in the directory is a .doc file which shows the layout of the virtual world.

Firmware for the Proj2Demo	
Name	**Description**
Assembly_code\Proj2\Proj2Demo\src\Proj2demo_With_NO_X_Reg.S	RISC Assembly Language source code for the Proj2Demo application. Note that this code is pretty much a direct port from the Picoblaze version; not all of the code is used and some of the comments are artifacts from the Picoblaze version. Even so, it is worthwhile to study and both Thong and Deepen have confirmed that it works.
Assembly_code\Proj2\Proj2demo*.S	Two versions of the above code that operate the same. One has registers named with X's and one has purpose named registers. Either is fine to use. Copy to the above area and leave only one assembly file if you want to switch.
Other Files	
ece540_ip_repo	This folder contains the IP for the Rojobot31. The folder should be added as a IP repository to either your project or as a default repository for the Vivado IP catalog to search. There are instruction for how to do this in the Project #2 write-up. The Rojobot IP should appear in the UserIP section of the IP catalog.
docs\ECE 540 Project 2 List of Files.pdf	This document