# White Paper 491 – FIR Filter design

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# OVERVIEW

The HLS based FIR Filter and associated scripts enables the generation 2 variants of the FIR Filter HLS project. One with 32-bit Single Precision Floating Point data-types and one with Fixed Point data-types. This allows the user to easily incorporate these 2 designs into the System Generator for DSP model included and perform a simple comparison of the 2 FIR designs. Evaluating resources, power and accuracy.

[Full Documentation](https://www.xilinx.com/support/documentation/white_papers/wp491-floating-to-fixed-point.pdf)

## 2. SOFTWARE TOOLS AND SYSTEM REQUIREMENTS

* Vivado HLS release 2016.4
* System Generator for DSP 2016.4
* Matlab R2016a or later

## 3. DESIGN FILE HIERARCHY

| FIR.cpp  
 | FIR.h  
 | FIR\_fp.inc  
 | FIR\_fp\_6digits.inc  
 | FIR\_test.cpp  
 | generate\_hls\_project.tcl  
 | README.md  
 | result\_golden.dat  
 | LICENSE.md  
 | CONTRIBUTING.md  
 \---- sysgen  
 | test\_des\_impulse\_wp491.slx  
 \---- power\_analysis  
 | UltraScale\_Plus\_XPE\_2016\_4\_Fixed.xpe  
 | UltraScale\_Plus\_XPE\_2016\_4\_Fixed\_x10.xpe  
 | UltraScale\_Plus\_XPE\_2016\_4\_FP32.xpe  
 | UltraScale\_Plus\_XPE\_2016\_4\_FP32\_x10.xpe

## 4. INSTALLATION AND OPERATING INSTRUCTIONS

The procedure to build both the HLS project is as follows:

*vivado\_hls generate\_hls\_project.tcl*

## 5. OTHER INFORMATION

For more information check here: [Full Documentation](https://www.xilinx.com/support/documentation/white_papers/wp491-floating-to-fixed-point.pdf) [Vivado HLS User Guide](http://www.xilinx.com/support/documentation/sw_manuals/xilinx2016_4/ug902-vivado-high-level-synthesis.pdf)

## 6. SUPPORT

For questions and to get help on this project or your own projects, visit the [Vivado HLS Forums](https://forums.xilinx.com/t5/High-Level-Synthesis-HLS/bd-p/hls).

## 8. CONTRIBUTING CODE

Please refer to and read the [Contributing](https://github.com/Xilinx/HLx_Examples/blob/master/DSP/fir_example/CONTRIBUTING.md) document for guidelines on how to contribute code to this open source project. The code in the */master* branch is considered to be stable, and all pull-requests should be made against the */develop* branch.

## 9. ACKNOWLEDGEMENTS

The Library is written by developers at [Xilinx](http://www.xilinx.com/) with other contributors listed below:

## 10. REVISION HISTORY

| **Date** | **Readme Version** | **Revision Description** |
| --- | --- | --- |
| 31MAR2017 | 1.0 | Initial Xilinx release |