Vivado

Initiation

Rui Machado
Embedded Systems Research Group (ESRG)
Centro ALGORITMI, Universidade do Minho

https://esrg.algoritmi.uminho.pt/

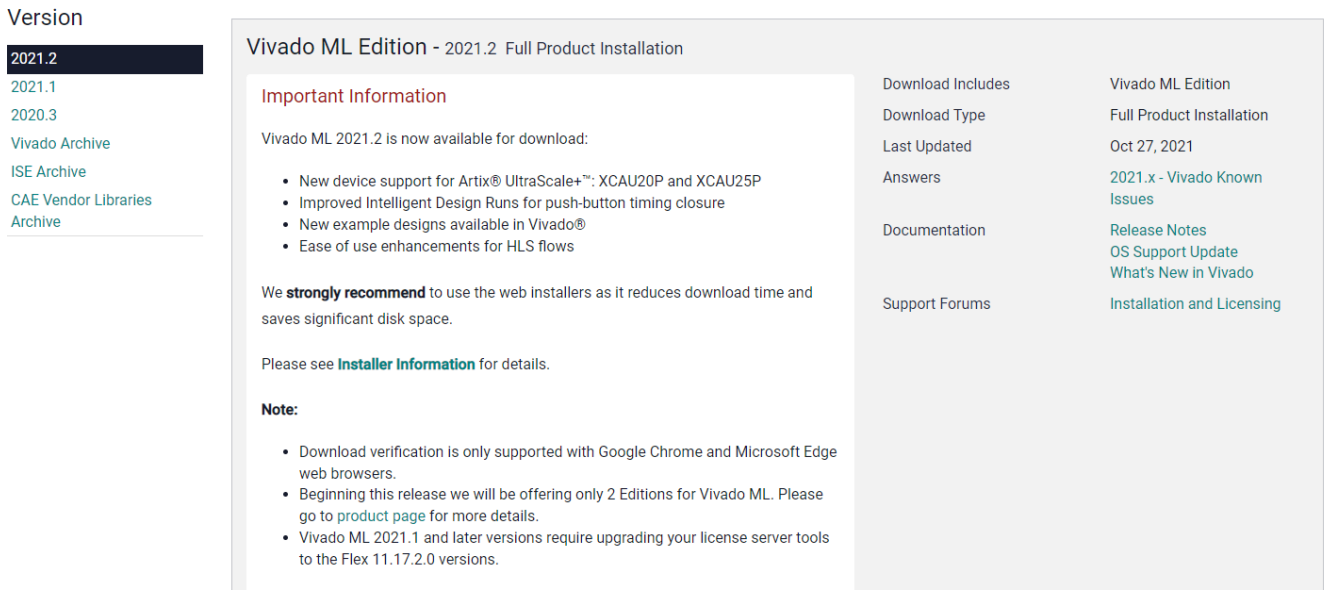
CENTROALGORITMI

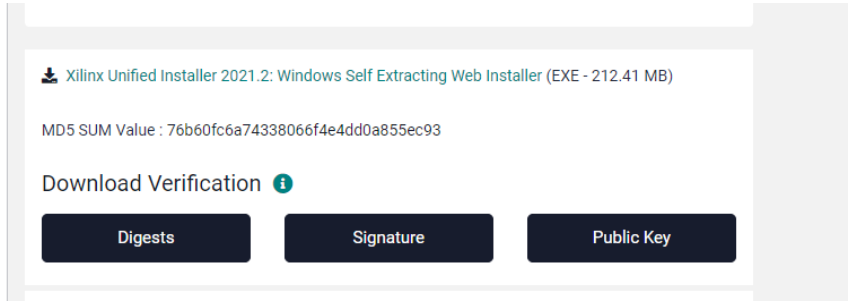
FCT Fundação para a Ciência e a Tecnologia

TABLE OF CONTENTS

Installation

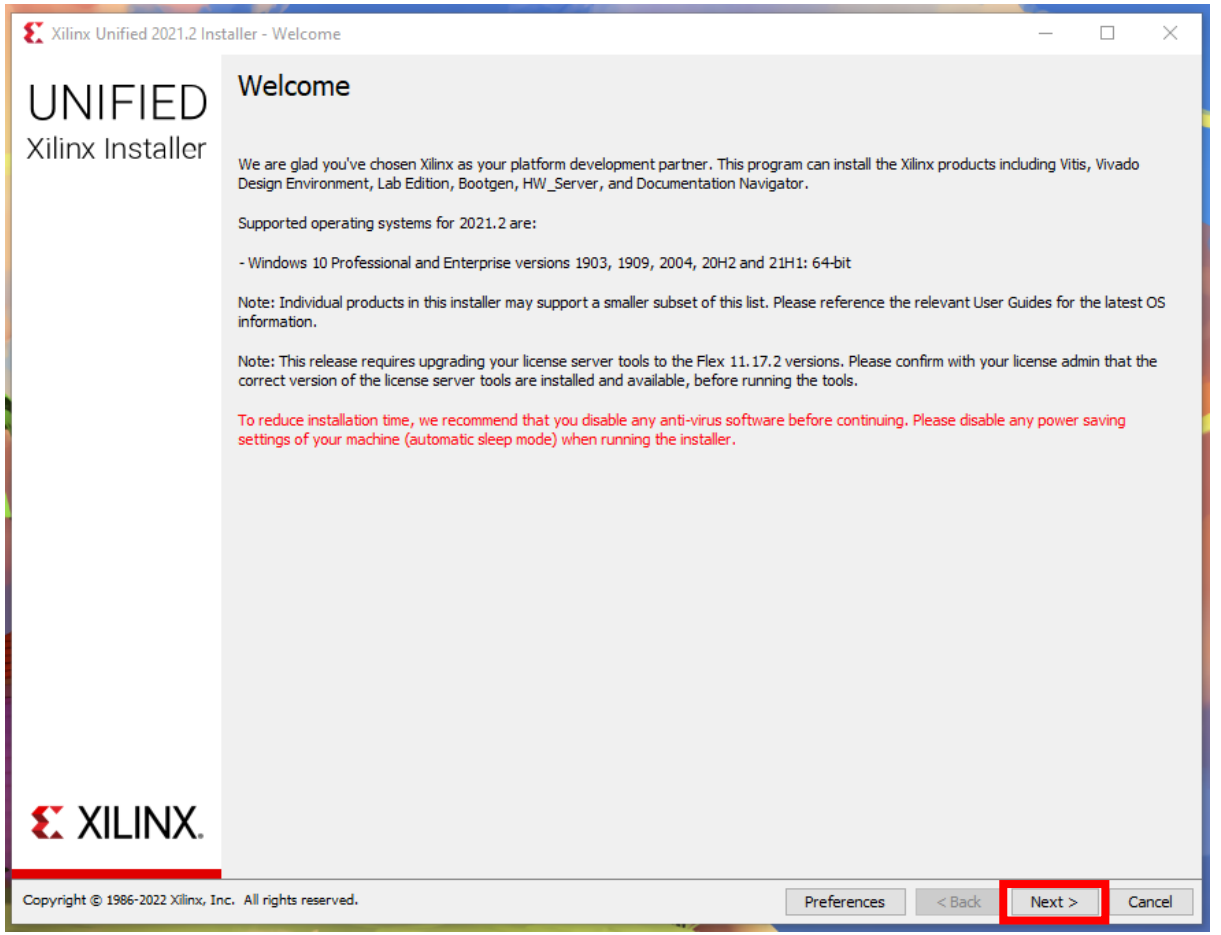
- Download Vivado/Vitis installer:
  - https://www.xilinx.com/support/download/index.html/content/xilinx/en/downloadNav/vivado-design-tools.html
  - Create an account and login to be able to download Vivado





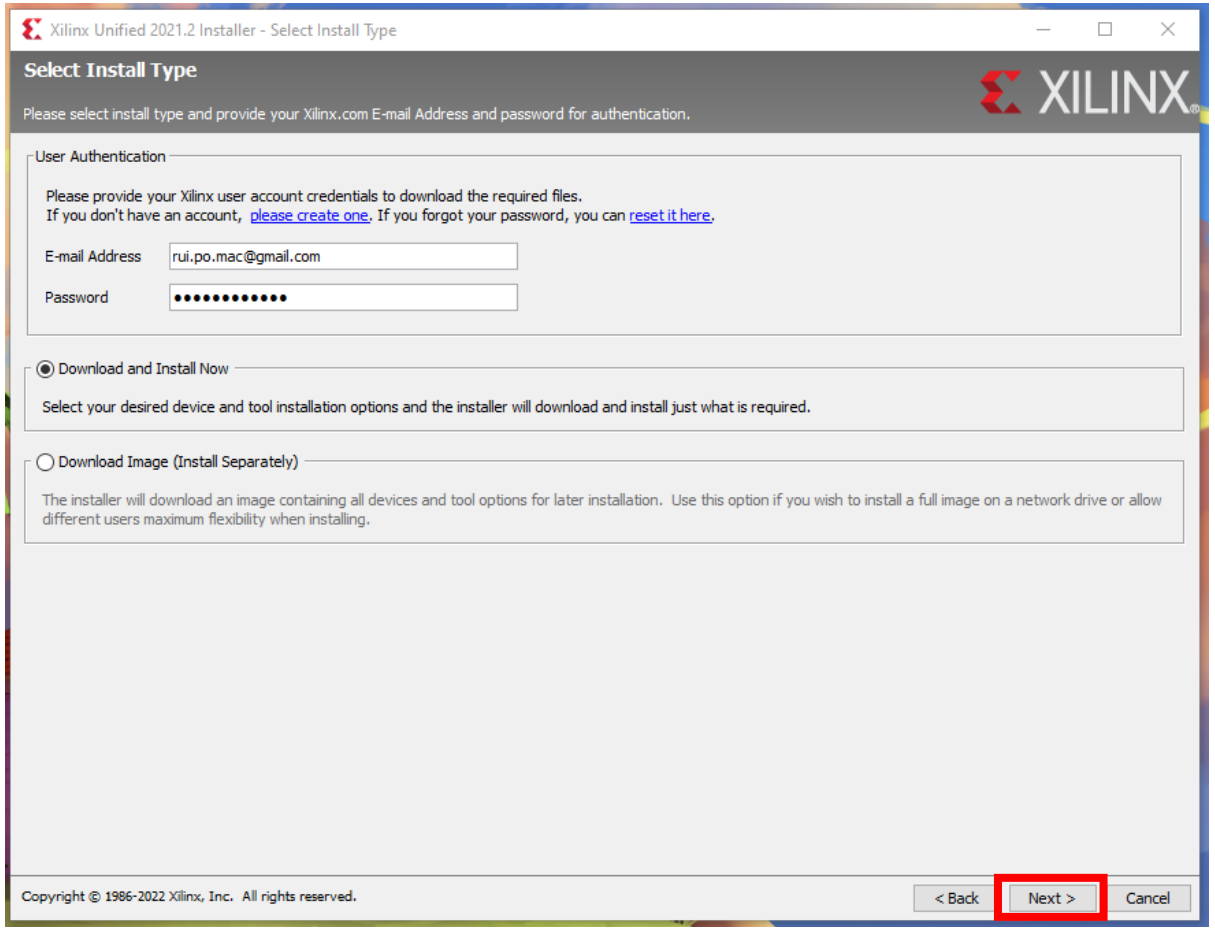
Installation

- Execute the installer as administrator
- Next on the first window



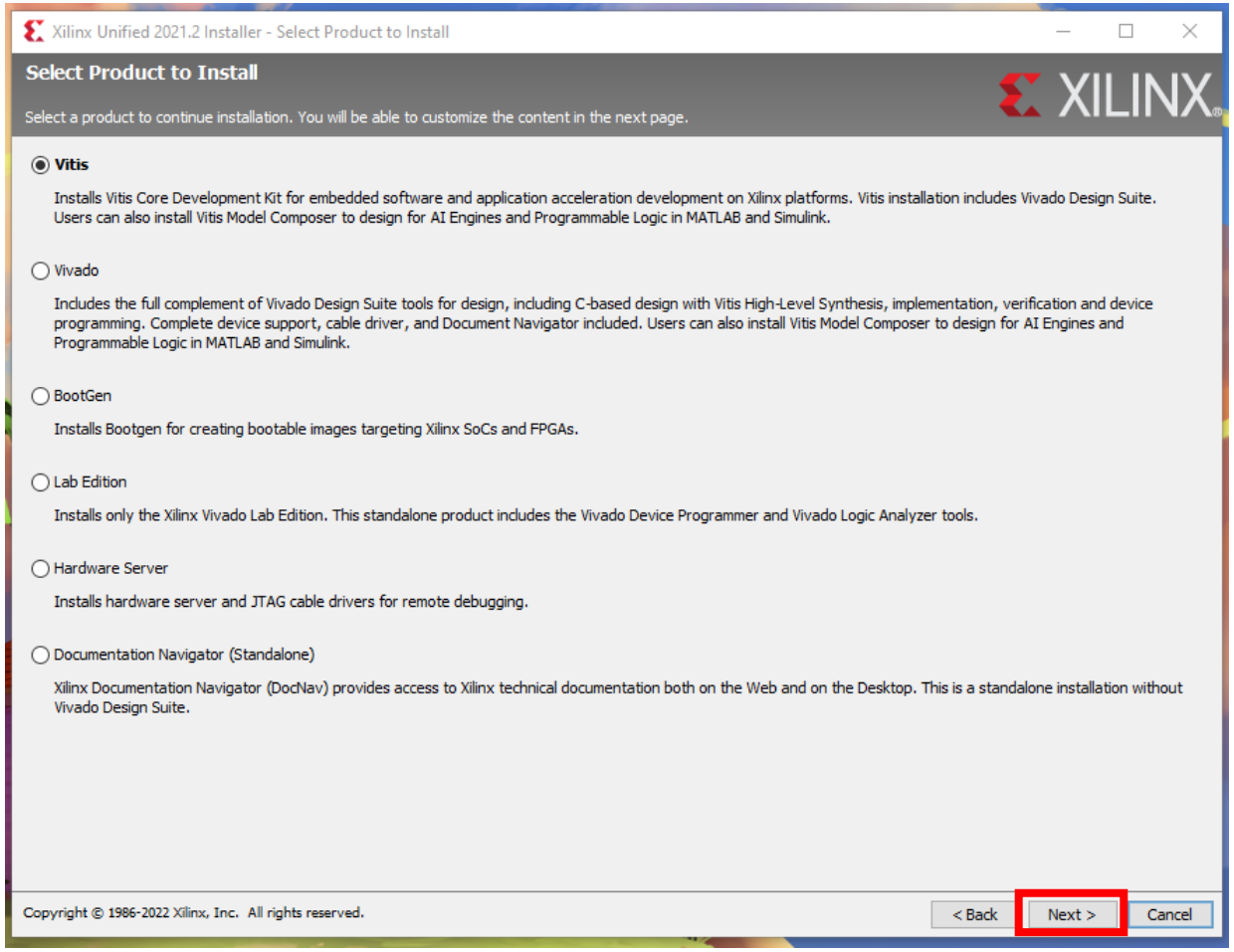
Installation

- Fill the user authentication form and select “Download and Install Now”
- Next



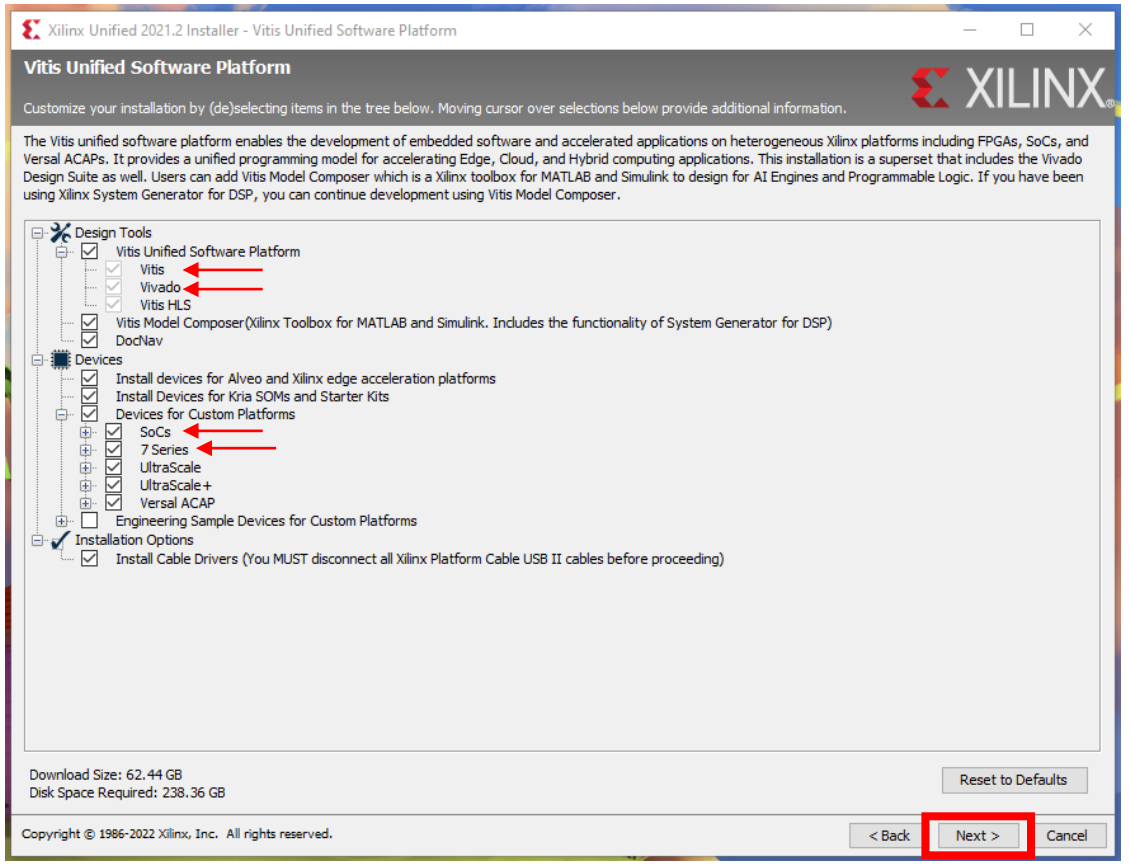
Installation

- Select “Vitis” – This will install Vitis and Vivado
- Next



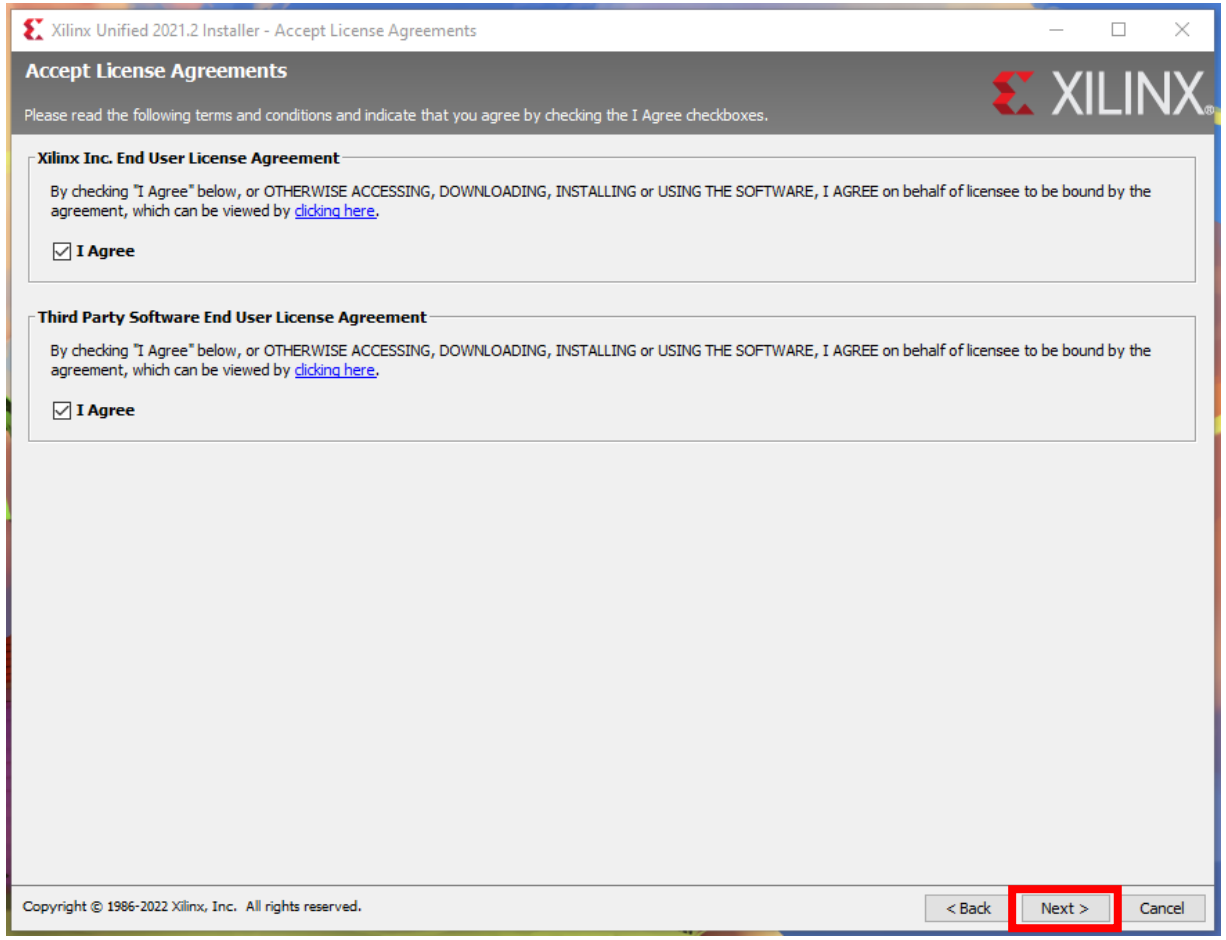
Installation

- Select the appropriated options then Next
- You do not have to install all Devices. If you want to save space, for this class you can just install the SOCs and 7 Series
- You can also decide not to install the Vitis HLS and the Vitis Model Composer



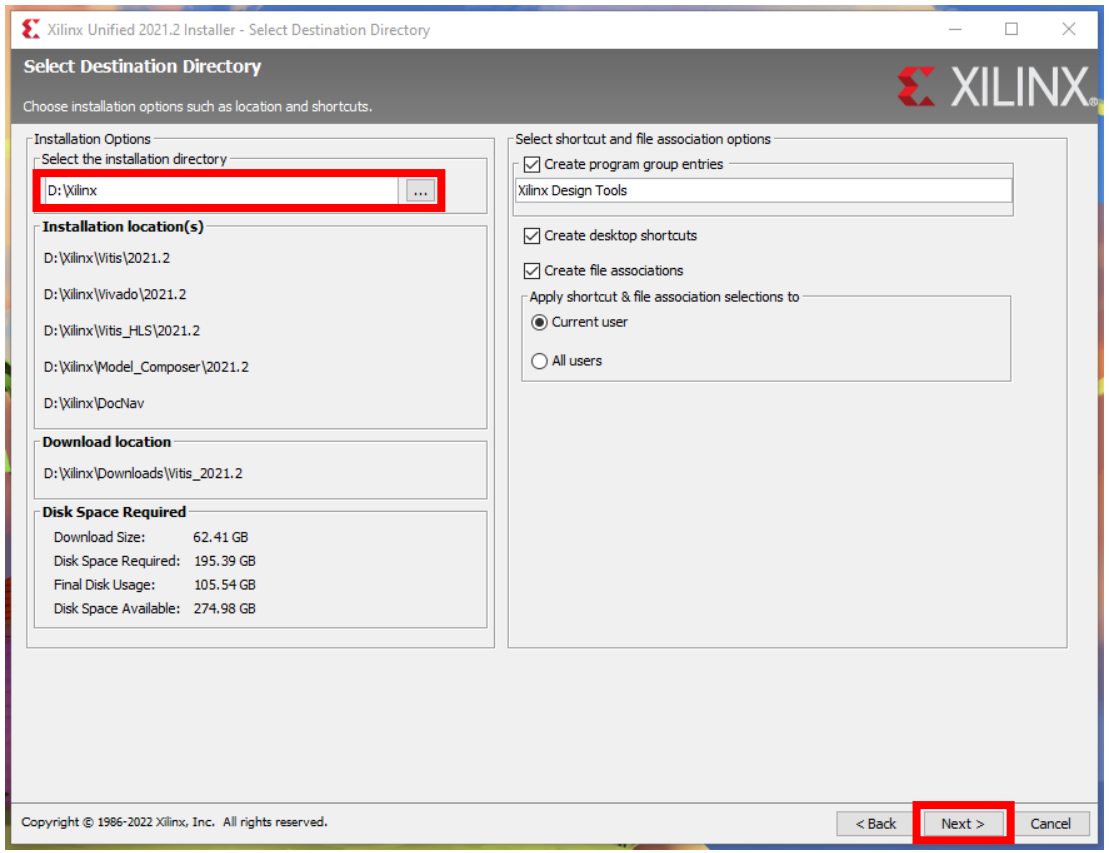
Installation

- Agree with the License Agreements and then Next



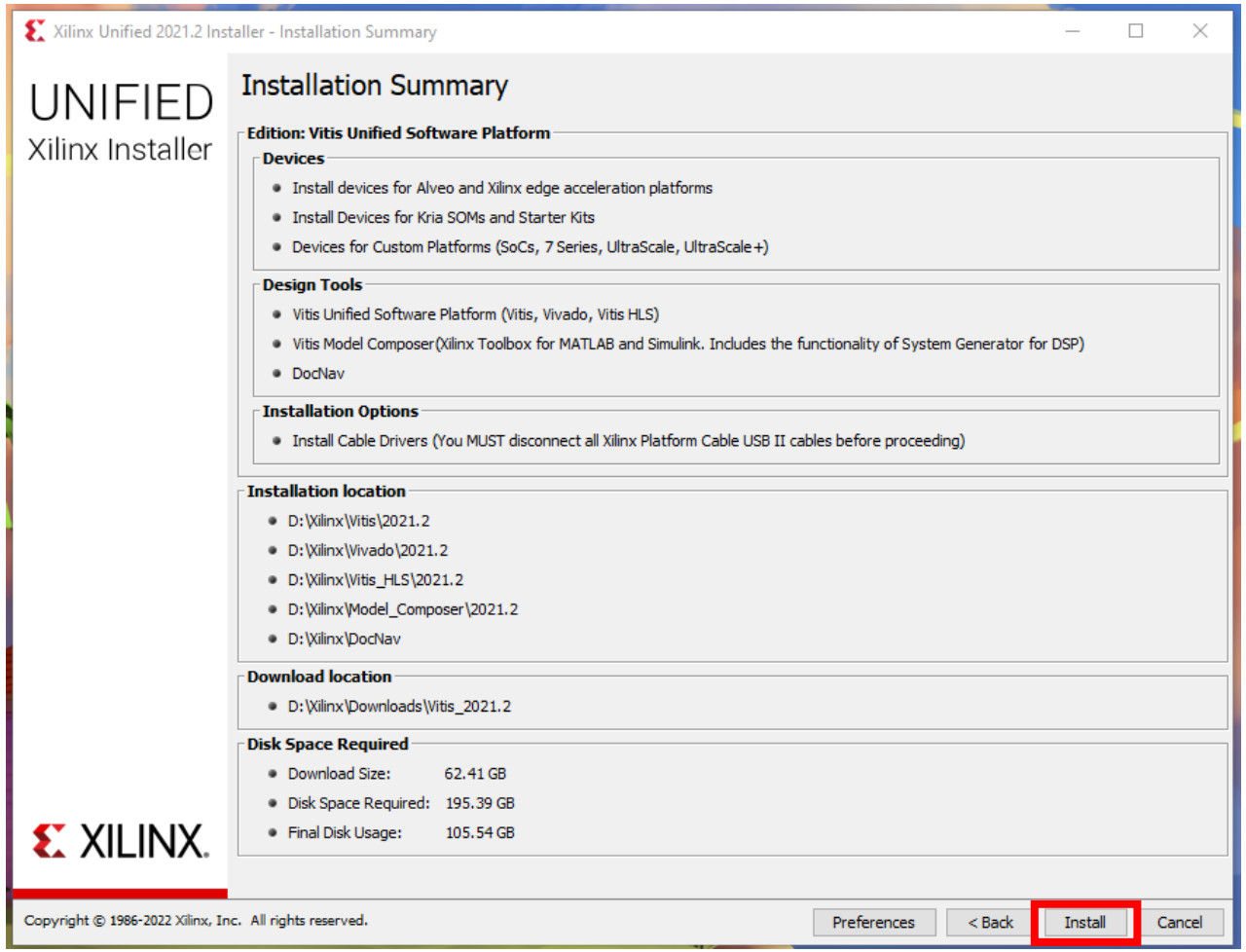
Installation

- Select the directory to install – This should be as short as possible to avoid future path length problems
- Next



Installation

- Confirm the installation information
- Install

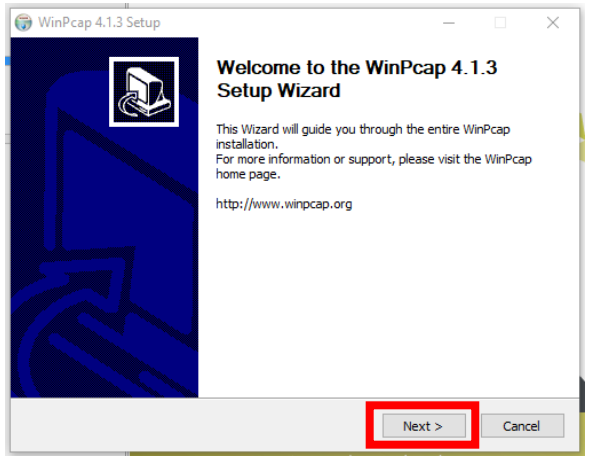


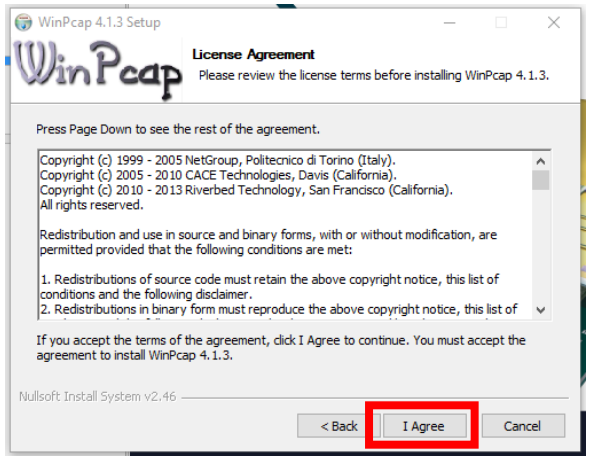
Installation

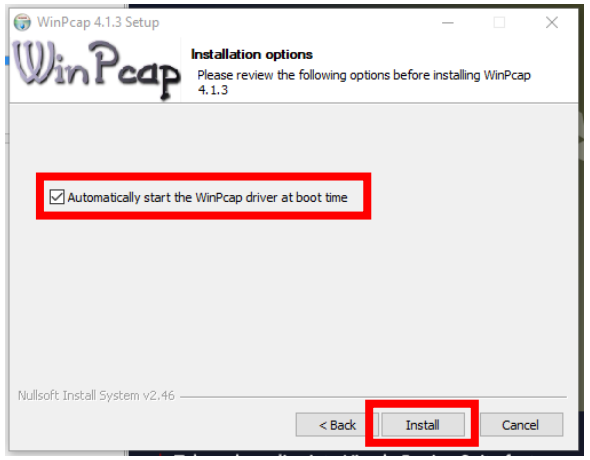
- Go grab a coffee… This will take a while…

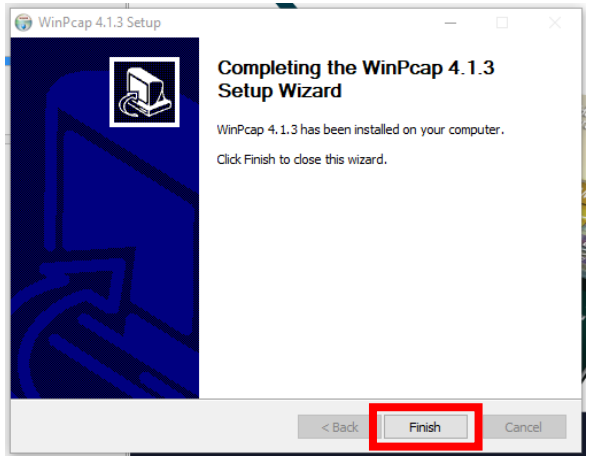
Installation

- Almost there. Install the WinPcap



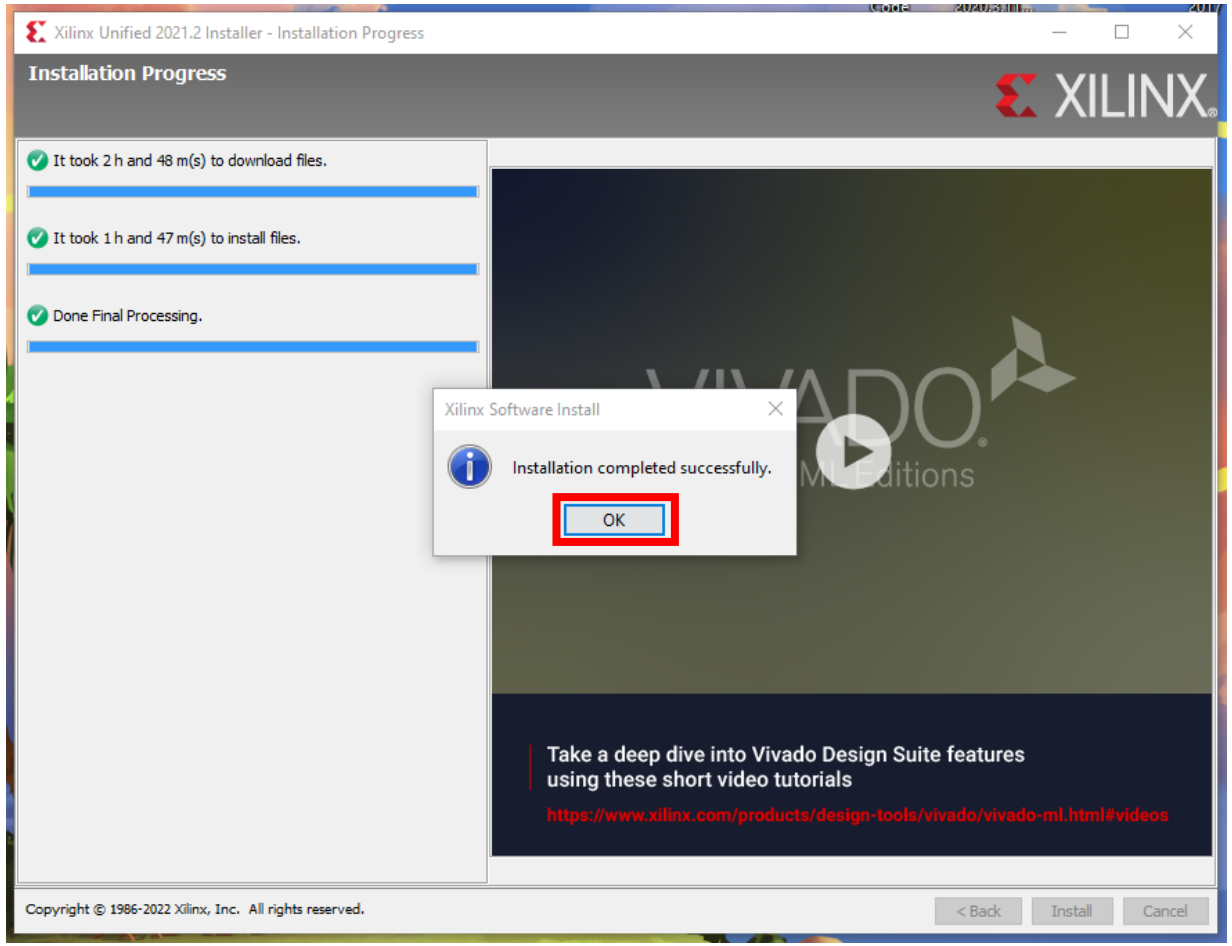






Installation

- Congratulations, you are one step closer to become an FPGA Engineer

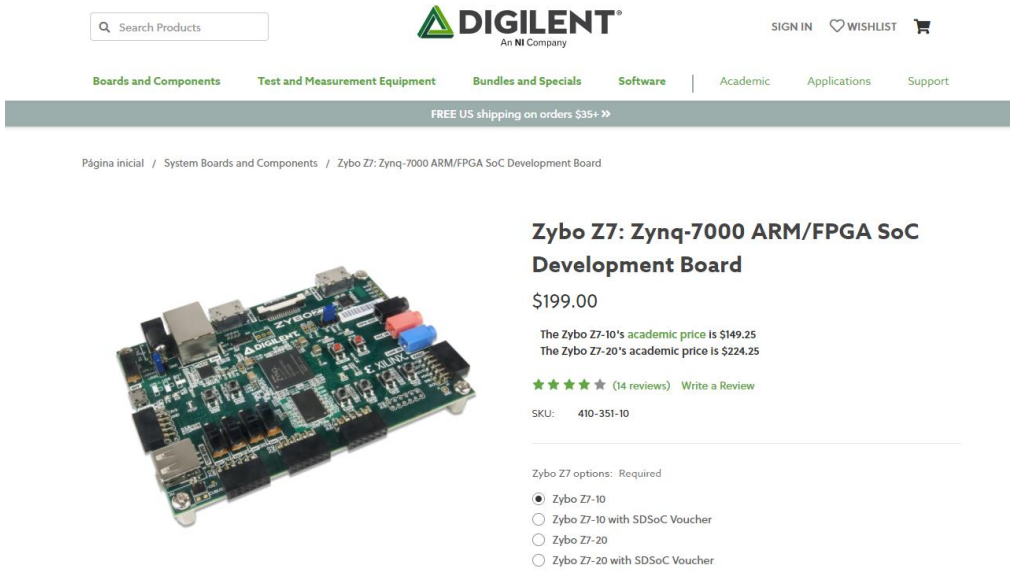


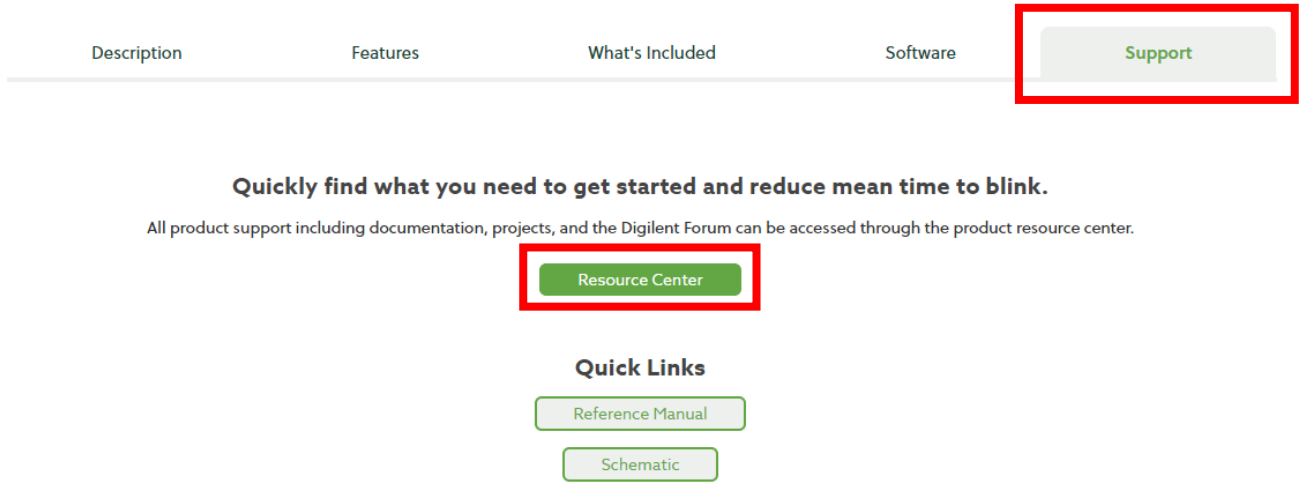
Installing a new board

- Zybo board as example:
  - https://digilent.com/shop/zybo-z7-zynq-7000-arm-fpga-soc-development-board/
  - https://digilent.com/reference/programmable-logic/zybo-z7/start?redirect=1
  - https://github.com/Digilent/vivado-boards?_ga=2.42031532.867636292.1643229174-1016055765.1642334752

Installing a new board

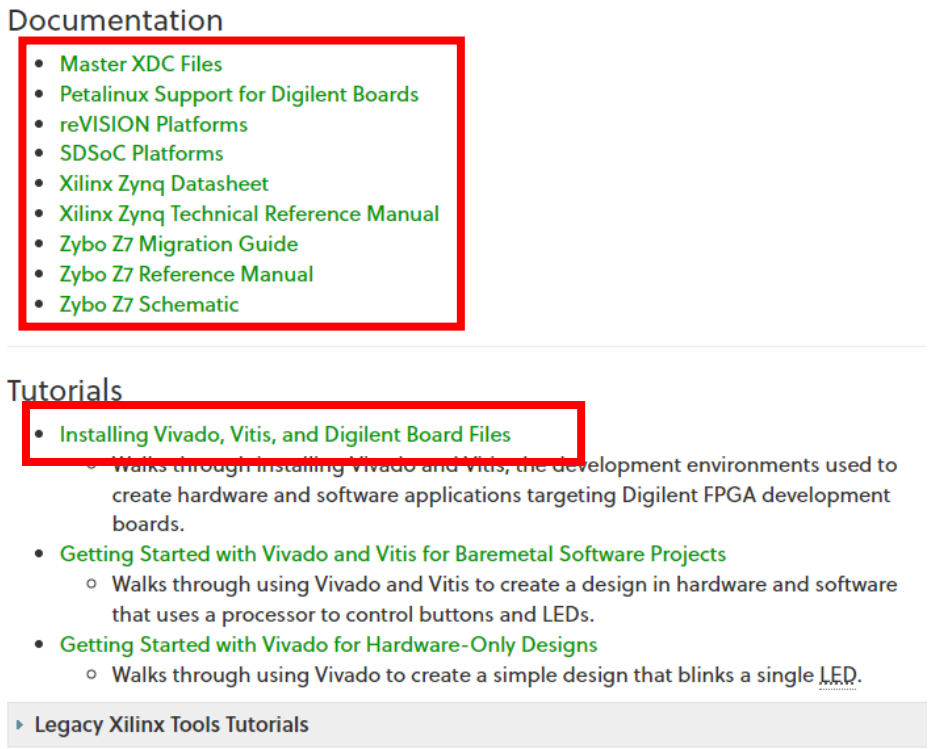
- On the Digilent Zybo Z7 board page select:
  - Support->Resource Center





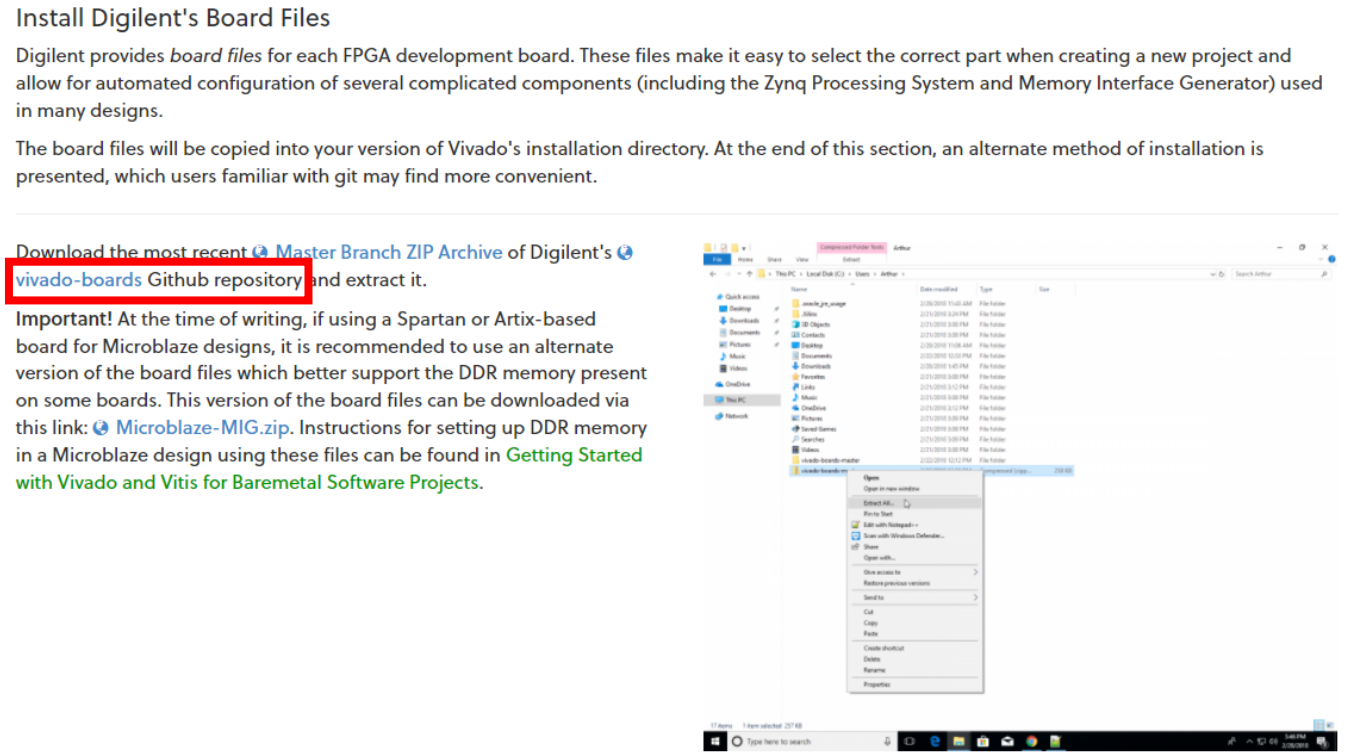
Installing a new board

- On the Resource Center page, you can access the board documentation
- To get the Board files select the “Installing Vivado, Vitis, and Digilent Board Files” Tutorial link



Installing a new board

- On the tutorial page, search for the vivado-boards Github repository link and click it
- Save de zip file



Install Digilent's Board Files

Digilent provides *board files* for each FPGA development board. These files make it easy to select the correct part when creating a new project and allow for automated configuration of several complicated components (including the Zynq Processing System and Memory Interface Generator) used in many designs.

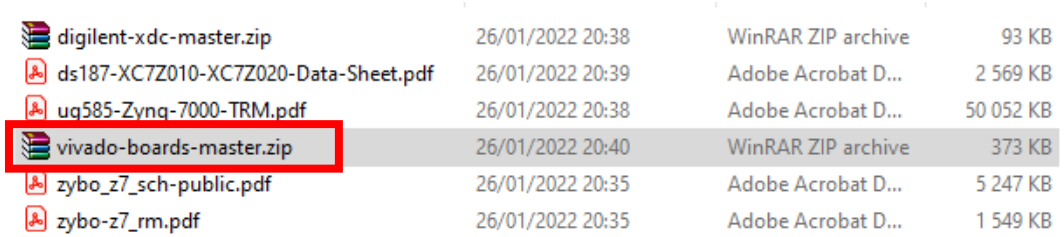
The board files will be copied into your version of Vivado's installation directory. At the end of this section, an alternate method of installation is presented, which users familiar with git may find more convenient.

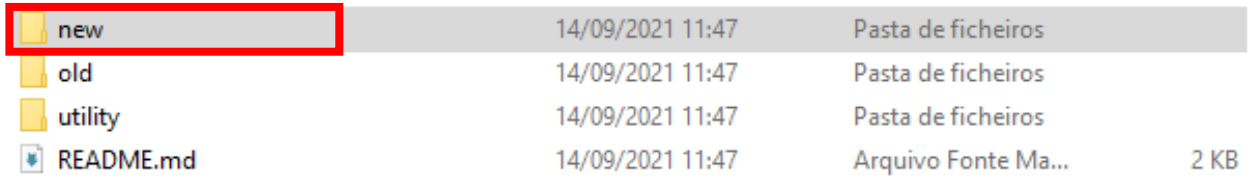
Download the most recent Master Branch ZIP Archive of Digilent's vivado-boards Github repository and extract it.

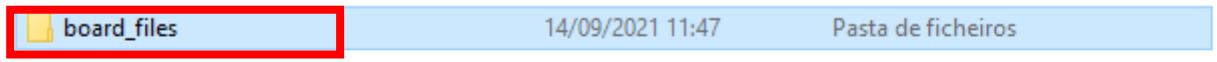
Important! At the time of writing, if using a Spartan or Artix-based board for Microblaze designs, it is recommended to use an alternate version of the board files which better support the DDR memory present on some boards. This version of the board files can be downloaded via this link: Microblaze-MIG.zip. Instructions for setting up DDR memory in a Microblaze design using these files can be found in Getting Started with Vivado and Vitis for Baremetal Software Projects.

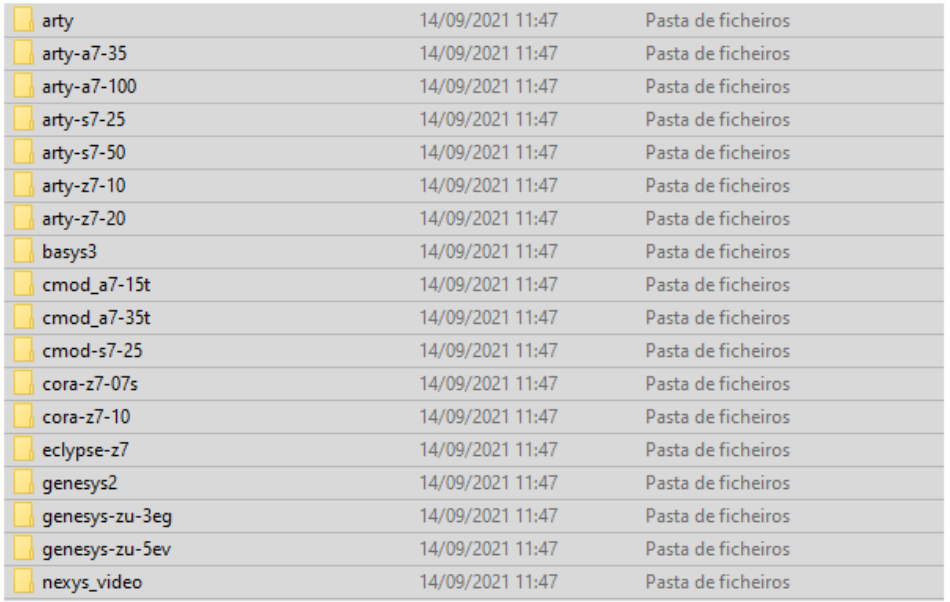
Installing a new board

- Extract the files and go to “new->board_files”







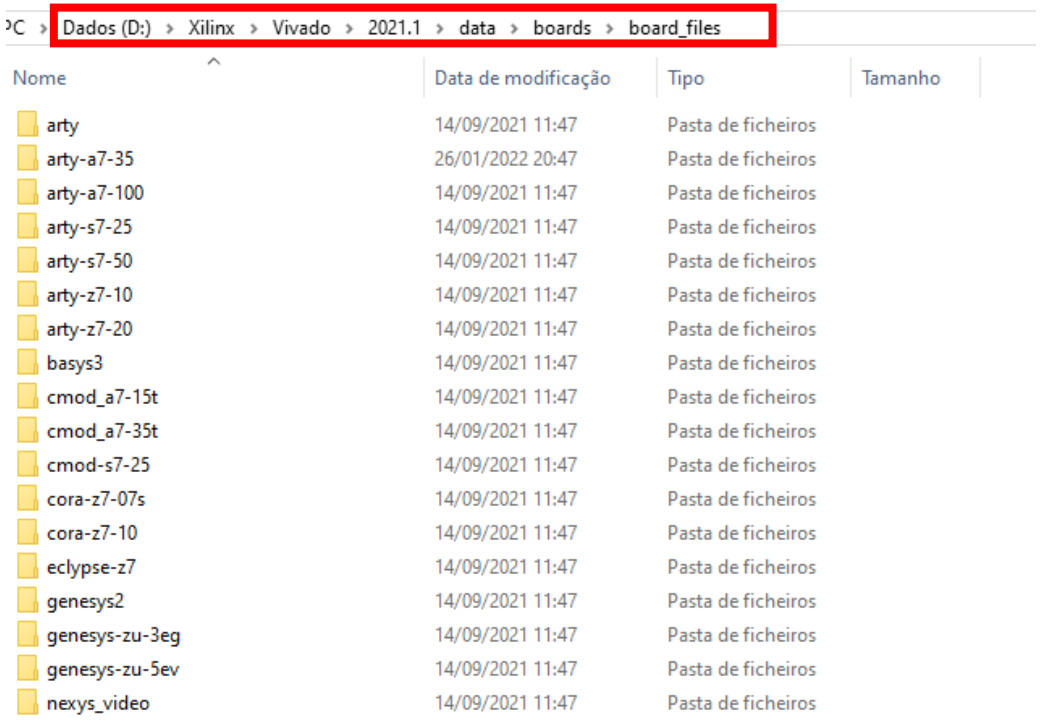


Installing a new board

- Select all the boards' folders and copy them
- Past them on "<installation root>/Xilinx/Vivado/<version>/data/boards/board_files"
- If there is no board_files directory just create one and past the boards there
- You are ready to go! Just open Vivado

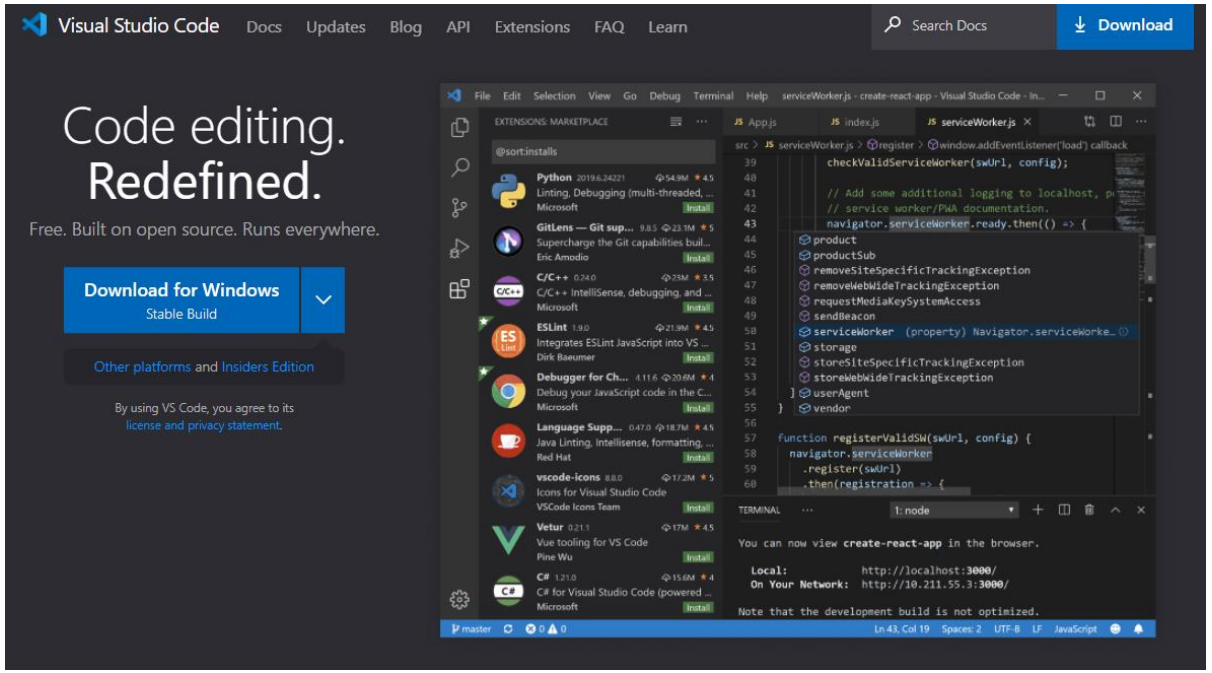
Installing a new board

arty	14/09/2021 11:47	Pasta de ficheiros
arty-a7-35	14/09/2021 11:47	Pasta de ficheiros
arty-a7-100	14/09/2021 11:47	Pasta de ficheiros
arty-s7-25	14/09/2021 11:47	Pasta de ficheiros
arty-s7-50	14/09/2021 11:47	Pasta de ficheiros
arty-z7-10	14/09/2021 11:47	Pasta de ficheiros
arty-z7-20	14/09/2021 11:47	Pasta de ficheiros
basys3	14/09/2021 11:47	Pasta de ficheiros
cmod_a7-15t	14/09/2021 11:47	Pasta de ficheiros
cmod_a7-35t	14/09/2021 11:47	Pasta de ficheiros
cmod-s7-25	14/09/2021 11:47	Pasta de ficheiros
cora-z7-07s	14/09/2021 11:47	Pasta de ficheiros
cora-z7-10	14/09/2021 11:47	Pasta de ficheiros
eclypse-z7	14/09/2021 11:47	Pasta de ficheiros
genesys2	14/09/2021 11:47	Pasta de ficheiros
genesys-zu-3eg	14/09/2021 11:47	Pasta de ficheiros
genesys-zu-5ev	14/09/2021 11:47	Pasta de ficheiros
nexys_video	14/09/2021 11:47	Pasta de ficheiros



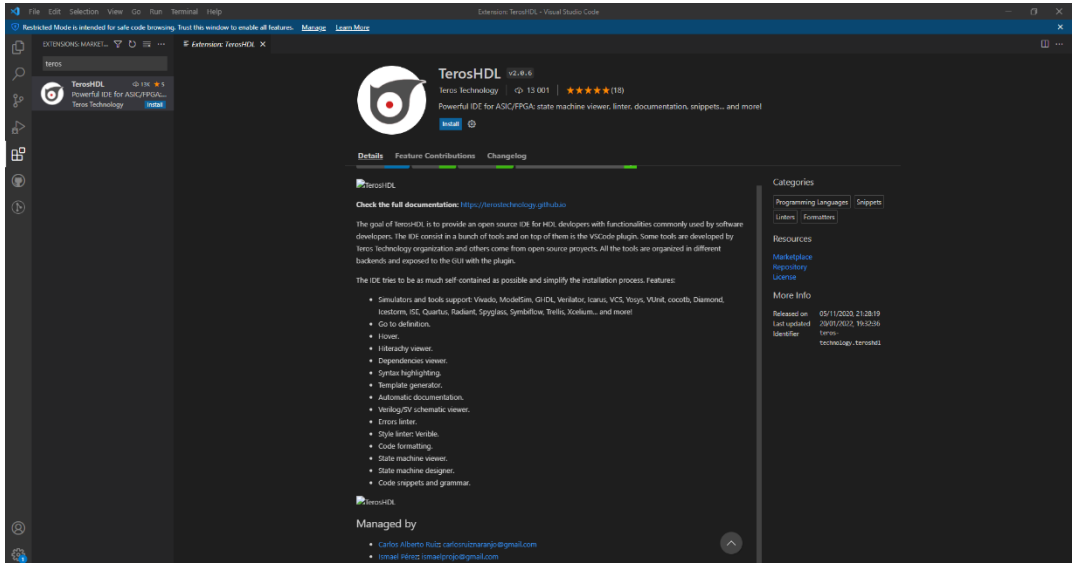
HDL Coding

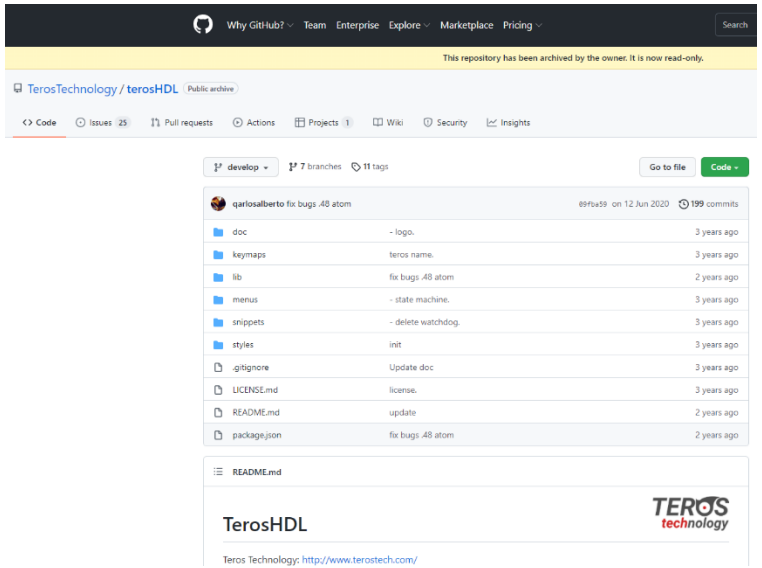
- Visual Studio Code: https://code.visualstudio.com/
  - Code editor
  - Has multiple add-ons that are useful for HDL development, such as TerosHDL



HDL Coding

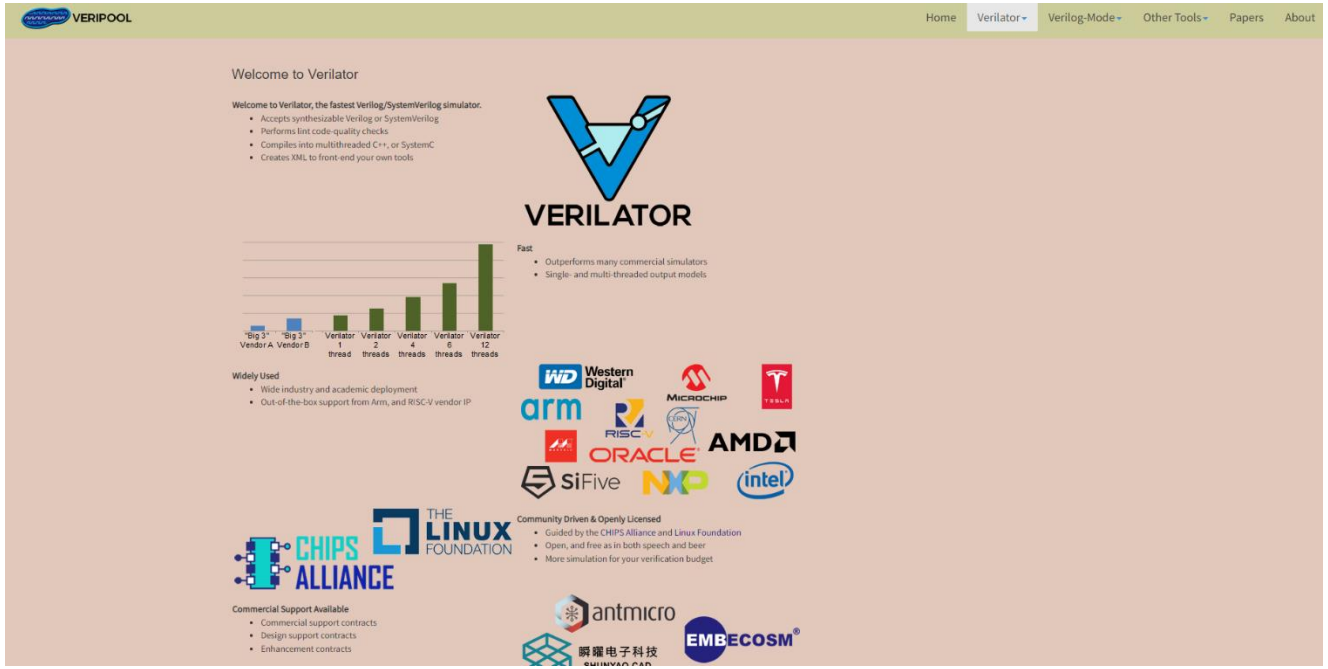
- TerosHDL: https://github.com/TerosTechnology/terosHDL
  - HDL IDE
  - Useful as a VS Code extension since it automatically generates designs documentation





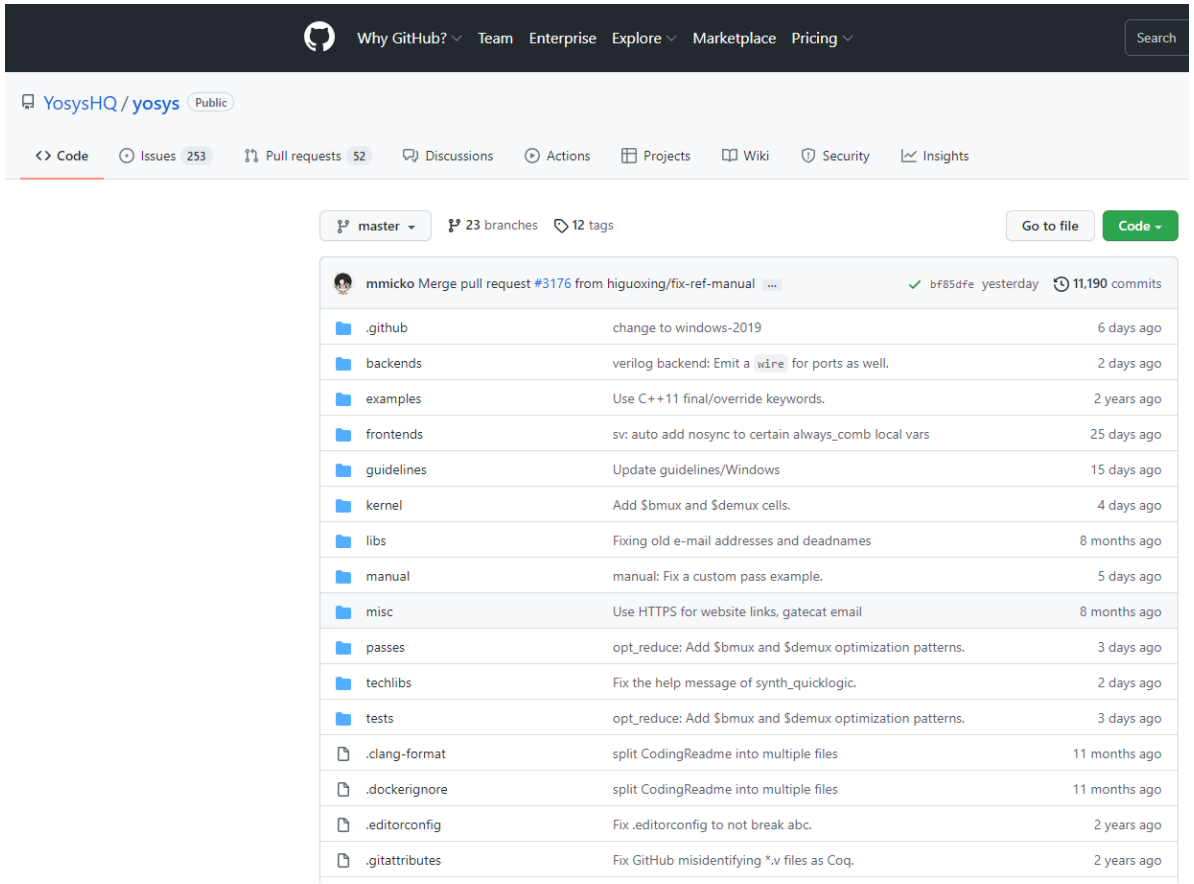
HDL Coding

- Veriator: https://www.veripool.org/verilator/
  - Verilog/SystemVerilog Simulator
  - **Has lint capabilities**



HDL Coding

- Yosys: https://github.com/YosysHQ/yosys
  - Synthesis tool



THANK YOU!

ANY QUESTIONS?

rui.machado@dtx-colab.pt