The purpose of the EMBS practicals is to help you to:

- Get comfortable with using FPGAs and the Xilinx development tools.
- Learn about programming embedded microcontrollers.
- Learn the Vivado HLS hardware development language.
- Start thinking about the way that hardware is implemented on FPGAs, and which constructs are cheap and which are expensive in terms of logic usage.
- Learn how to engineer the architecture of a solution to exploit the parallelism available.
- Explore the trade-offs that are found in embedded development.

You must complete each practical before the start of the next one, as many of the concepts used will be examined in the assessment. If any aspects of the practicals are unclear, please ask Ian or Russell to explain.

These practicals should all be performed with the lab machines in Linux.

It is also possible to use the tools and access FPGA boards remotely – see the Using the Virtual Lab and Using the Xilinx Tools Remotely pages.

Resources

The Resources pages show information about the tools and devices we are using, as well as links to full documentation.

The content on these pages is essential for completing the practicals.

Logbook

At six points throughout the practicals, blue text will tell you to show something to a demonstrator. These can be attempted any number of times, and can be marked off any time up to the end of the module. They are not an exam, they are to help you to progress through the course. We would expect that everyone gets all six marks.

List of Practicals

These practicals should be attempted in order as they build on knowledge from the previous practicals.

Week 6 Practicals:

- Practical 1 - Getting Started
- Practical 2 - ARM Software

Week 7 Practicals:
- Practical 3 - Advanced Software
- Practical 4 - Vivado HLS

Week 8 & 9 Practicals:
- Practical 5 - Vivado HLS Problem
- Practical 6 - Using HLS Components in Vivado

Week 10 Practicals:
- Practical 7 - EMBSCoin