

REV2021 Workshop/Tutorial Proposal

Title

Digital Design on remote FPGAs and the impact on students' learning

Type

[Please select with a "X"]

X	Workshop
	Tutorial

Duration

3 hours

Purpose/Objectives

The goal of this workshop is to engage educators and industry professionals in a discussion on the growing trend of transforming traditional labs to a full-fledged remote environment. The workshop will start with a tutorial where the audience experiences a hands-on exercise on programming a remote FPGA. Second hour will be a presentation on an implemented remote feature that uses a VGA port interfaced with an FPGA board to allow graphics drawing. In the third hour, the audience will form groups to discuss techniques and best practices and pros and cons of a remote experience on the students learning outcomes. No prior experience with FPGAs is expected.

Audience

This workshop might be of particular interest to educators in the engineering field (electrical and computer engineering, and computer science) but it is open to STEM educators where hands on labs are part of the curriculum. Industry professionals are invited to attend.

Overview

This workshop addresses the approach that University of Washington and UPNA took in partnership with LabsLand to combat the disruption that Covid-19 brought to the courses that have large hands-on labs. A tutorial will be presented on how to design a simple circuit using hardware descriptive language and the attendees would run the design on remote FPGAs. The tutorial will walk the audience through the steps of writing a code in SystemVerilog for those who are not familiar with HDL and FPGA. The audience will run the code on the LabsLand platform on FPGAs hosted at the University of Washington and UPNA. The second part of the workshop would be a presentation on the implementation of a remote feature that interfaces VGA display with FPGA boards for graphics drawing. The third part will be discussion on strategies for educators from a pedagogical standpoint. Audience will also get a chance to network and discuss potential collaboration in this field.

Topics - Timetable

[Please fill the following table with the list of topics and the estimated duration for each topic. Please add rows to the table if necessary]

Topic	Duration (h)
<i>Designing a circuit and running it on remote FPGAs</i>	<i>1 hr</i>

<i>Interfacing VGA display with remote FPGA boards</i>	<i>1 hr</i>
<i>Discussion groups Networking and collaboration</i>	<i>1 hr</i>

Presenter(s)/Facilitator(s)

Rania Hussein, PhD

Assistant Teaching Professor

Department of Electrical and Computer Engineering

University of Washington (UW)

Seattle, WA

United States of America

<https://people.ece.uw.edu/rhussein/>



Dr. Rania Hussein is an Assistant Teaching Professor in the department of electrical and computer engineering and a senior research scientist at the UW ECE Sensors, Energy, and Automation Lab (SEAL) where her research focus is on embedded systems, image processing, and machine learning. She is a senior IEEE member, a member of the UW faculty council on teaching and learning with over 10 years of work experience in higher education. She has taught and developed courses in digital design using FPGAs and established the first Remote hardware lab at University of Washington (UW). Before joining UW she worked as a research engineer at the Walt Disney company where her focus area was on software development and researching cutting edge technologies such as big data, sentiment analysis, and gamification.

Candido Aramburu, PhD

Professor

Department of Electrical and Electronics Engineering

Public University of Navarre (UPNA)

Spain



Dr. Candido Aramburu is a Professor in the Department of Electrical and Electronics Engineering at the Public University of Navarre (UPNA). He holds a PhD by UPNA and Engineering in Telecommunications by the Technical University of Madrid (UPM). Before UPNA, in 1990 he worked in the R&D department of Ikusi-SA, developing digital electronics equipment for telemetry applied to electrical energy for companies like Iberdrola and Energía Hidroeléctrica de Navarra. In 1992, Cándido joined UPNA. His research interest has been focused on Integrated Optics, being a visiting researcher at the ENSERG laboratory of Grenoble (France), and collaborating with University Carlos III of Madrid and IMEC in Gent (Belgium).

Pablo Orduna, PhD

Co-founder and CEO

LabsLand

United States of America



Dr. Pablo Orduna is co-founder and CEO of LabsLand. Pablo obtained his PhD in the University of Deusto, with a PhD research visit in the MIT; as well as graduated from the Global Solutions Program of the Singularity University in NASA Ames. As part of his research in DeustoTech, he has published over 150 scientific articles and participated in EU funded projects (H2020, FP7), with different international awards including the MIT TR35 Spain for top 10 innovators in Spain by the MIT Technology Review.

Equipment

Laptop and internet connection