

UNIVERSITY OF LOUISIANA AT LAFAYETTE

STEP Committee

Technology Fee Application

VLSI Lab Upgrade (School of Computing and Informatics)

Title

Shelby A. Williams

Name of Submitter
(Faculty or Staff Only)

*Electrical and Computer Engineering Department
& School of Computing and Informatics*

Organization

Title: VLSI Lab Upgrade Date: Jan. 15, 2024
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Department/College/Org: Electrical Engineering / Engineering / UL Lafayette

ABSTRACT (250 words or less):

This is a proposal for the purchase and installation of seven computers, a wall-mounted TV, Cajun-card access and a color LaserJet printer for the Very Large Scale Integrated (VLSI) Laboratory in the School of Computing and Informatics. This laboratory is in Oliver Hall, Room 204. This lab is used by undergraduate and graduate (both Masters and Ph.D.) students majoring in Electrical Engineering, Computer Science, Computer Engineering and Informatics. Students using this lab are from many countries. This laboratory gets a tremendous amount of use for courses and research projects. Hundreds of students using this lab have graduated and gone to work for companies such as Intel, IBM, AMD, Qualcomm, Nvidia, etc. Moreover, the students working in this lab have gone to hundreds of conferences and have published thousands of papers over the years. This lab is used for simulating very complex circuits with tens of thousands of components. These simulations usually take from several hours to days to complete. There are currently seven computers that are about ten years old. The upgrades proposed will not only modernize the lab, but it will reduce the computer software simulation time down to minutes. Additionally, students will be more productive and enjoy spending more time in the lab.

Purpose of Grant

The overall goals of this grant are to modernize the VLSI lab in the Computing and Informatics Department.

- The primary impacted courses are CSCE 585 (VLSI Design and Implementation) taught by Dr. M. Hassan Najafi, CSCE 586 (VLSI Architecture) taught by Dr. Magdy Bayoumi, CSCE 573 (Analog VLSI Design) and CSCE 582 (Computer Arithmetic), both taught by Dr. Martin Margala. All Computer Engineering graduate students are required to take at least one of these hardware-oriented courses. And several Computer Science and Informatics students take these courses as well.
- The School of Computing and Informatics is reviewed by the ABET (Accreditation Board for Engineering and Technology, Inc.) and SACS (Southern Association of Colleges and Schools Commission on Colleges) as part of the departmental accreditation processes.
- Students will be better able to run laboratory simulations and complete experiments with much less difficulty given more up-to-date computers.
- Students has consistently complained about outdated computers in this laboratory.

VLSI Laboratory

The VLSI Laboratory is housed in Oliver Hall in Room 204. It supports many core course offered by the School of Computing and Informatics. The four primary impacted courses are CSCE 585, CSCE 573, CSCE 582 and CSCE 586. The first is only offered in the fall semesters and the last is only offered in the spring semesters. This lab serves several purposes: (1) studying for courses, (2) researching, (3) simulating circuits and (3) giving presentations. Additionally, students can access this computing resources remotely.

Impact To Student Body As a Whole

The proposed upgrade will have a direct impact on the all of the students majoring in Electrical/Computer Engineering, Computer Science, Informatics and indeed its impact is even broader. Both undergraduate and graduate students in EECE, and graduate students in computer engineering are required to take Electrical Engineering courses. This grant also will go along with the strong mandates of ABET Accreditation of the EECE and School of Informatics departments, necessary for attracting excellent engineering students to UL Lafayette.

Projected lifetime of enhancement

The projected lifetime of equipment in this enhancement project is more than 5 years.

Person(s) responsible for implementation, installation, maintenance, operation and training

The project directors listed below with their corresponding titles and department affiliation, are responsible for a timely installation of the proposed equipment and implantation of the project. They will train students in the operation and maintenance of the equipment of the proposed project.

Project Director and Co-project director:

SHELBY WILLIAMS, M.S. Laboratory Manager, *Electrical and Computer Engineering Dept.*

JETTISON CHRISTOPHER, Ph.D. Senior System Administrator for the School of Computing and Informatics

The project director of this grant proposal, *Shelby Williams* serves as the Laboratory Manager in the Electrical and Computer Engineering Department. He has written several funded STEP proposals over the past 15 years for upgrading nearly all laboratories in the department. He has worked in his current capacity for the past 25 years.

Jettison Christopher is the Senior System Administrator for the School of Computing and Informatics at the University of Louisiana at Lafayette.

Equipment List and Proposed Upgrades

Proposed Upgrades

- 7 Computers
- 7 Computer Mounts
- 14 Monitors
- 7 Webcams
- 1 65" Samsung TV
- 1 Cajun-card Room Access
- 1 Color LaserJet Printer

Existing Equipment

- 7 Surplus Dell Computers
- [10+ years old]

Item	Description	Quantity	Unit Price	Subtotal
1	Desktop Enhanced – Dell Optiplex 7000 Computer	7	\$1,398	\$9,786
2	Computer Desk Mounts	7	\$35	\$175
3	27" Monitors	14	\$230	\$2,940
4	Soundbar for Dell Model P2222H	7	\$45	\$315
4	Webcam with Microphone	7	\$25	\$175
5	65" Samsung TV	1	\$700	\$700
6	TV Wall Mount	1	\$230	\$230
7	Cajun-Card Electronic Room Access	1	\$15,000	\$15,000
8	Color LaserJet Printer	1	\$570	\$570
			Total	\$29,891

PC Depot Desktops

Enhanced Desktop - Dell Optiplex 7000 series



- Intel Core i9-13900 (8+16 Cores/36MB/32T/2.0GHz to 5.2GHz/65W)
- 32 GB, 2 x 16 GB, DDR5
- 256 GB, M.2 2230, PCIe NVMe, SSD, Class 35
- 5x USB 3.2 (1 front/4 rear), 1x USB 3.2 Type C (1 front), 4x USB 2.0 (2 front/2 rear), RJ-45, Display Port 1.4a, HDMI 1.4b, 1x UAJ
- ProSupport Warranty, 5 Years
- Windows OS
- Microsoft 365
- Dell Mouse and Keyboard Included

1398.00

Dell 27" Monitor



- Maximum Preset Resolution – 1920 x 1080 at 60 Hz
- Cables Included: Power Cable & DisplayPort Cable
- Ports & Slots: Power Connector, HDMI Port, DisplayPort & VGA Connector
- Soundbar not included

Can be added as a stand alone or "2nd monitor"

NOTE: 27" Monitors are NOT stocked in-house, and will take additional time for shipment and delivery

230.00

Webcam w/ Microphone



Webcam with integrated microphone

- 1080p HD resolution
- Privacy cover
- 110-degree viewing angle
- Integrated tripod

25.00

Dell Slim Soundbar SB521A



Soundbar that attaches to Dell Monitor model P2222H.

45.00

Project Plan

Previously funded STEP Projects:

- MATLAB/Simulink on UCS System – July 1999
- Additional and Upgrade of for EECE Student Laboratory – July 1999
- EE Electronics Laboratory – January 2012
- EE Computational Upgrades – July 2014
- Test and Measurement Upgrades – January 2018
- Freshman Computer Engineering Teaching Lab Upgrade – July 2022

Budget

The budget over a one-year period totals \$29,891. Mr. Shelby Williams and Mr. Jettison Christopher will ensure the timely purchase and installation of the equipment and all other activities proposed in this project. Every semester several graduate students are assigned from the department to the directors of this project that will be assisting in the implementation of this project.

Budget Proposal

1. **Equipment** **\$ 29,891**

2. **Software** **\$**

3. **Supplies** **\$**

4. **Maintenance** **\$**

5. **Personnel** **\$**

6. **Other** **\$**

TOTAL: **\$ 29,891**