UNIVERSITY OF LOUISIANA AT LAFAYETTE

STEP Committee

Technology Fee Application

Equipment for the Video Game Design and Development (VGDD) Lab
Title

Dr. Arun K. Kulshreshth
Name of Submitters

School of Computing and informatics
Organization

Title: Equipment for the Video Game Design and Development (VGDD) Lab **Date:** 07/17/2023

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ABSTRACT:

Video game design and development is a prominent area and an immensely popular concentration choice for computer science undergraduate students. Due to recent advancements in graphics and virtual reality technology, there are so many job opportunities available for the students in this area. The Video Game Design and Development (VGDD) laboratory is the main laboratory used by our undergraduate students in the video game design concentration. Due to the recent increase in enrollment in our program, the number of computers (currently 26) in this lab is not enough to support the video game design and related classes. Out of these 26 machines, many machines are outdated and are not capable of supporting newer software needs for the game design classes. This negatively affects related classes in this area. This laboratory is utilized every semester by both undergraduate and graduate students who take video game design courses, Virtual reality course, computer graphics course, and students/researchers who need high performance machines for their projects/research work. This request is for funding to enable the acquisition of equipment to enhance this lab, specifically adding more computers to support the increase in class size (e.g., 28 students are enrolled for the Fall 2023 in the introductory game design class - CMPS 327). If funded, these enhancements will allow students to develop both knowledge and experience, making them more competitive in the job market, and will help us to continue attracting more students to our program.

Proposal Description

A) Purpose of grant and impact to the student body as a whole

Becoming a computer scientist and software developer requires computer science majors to work toward developing their knowledge, skills, and experience. The purpose of this grant is to assist these students in their development by enhancing the Video Game Design and Development (VGDD) laboratories in the School of Computing and Informatics. The enrollment in the computer science program is growing every year making classes larger every semester. Currently, we have 26 machines in this lab and currently for Fall 2023 we already have 28 students enrolled in the games design class (CMPS 327). Out of the 26 machines, many machines (10+) are outdated and are not powerful enough to run modern games engines (we use Unity 3D for classes). We expect that our classes will continue to grow in size in the near future and we need to be ready to support classes in this lab. Due to the unavailability of good computers in this lab, many students are forced to use their own laptop (if they have any) and this negatively affects their learning since most laptops do not have a good graphics card for game development. Thus, we are proposing to replace/add more computers to this lab to support our game design related classes. This laboratory is utilized every semester by both undergraduate and graduate students who take video game design courses (CMPS 327, CMPS 427, and CSCE 538), Virtual Reality course (CMPS 499, CSCE 598, CSCE 615), computer graphics courses (CMPS 415, CSCE 515), and students/researchers who need high performance machines for their projects/research work. In addition, this lab also serves as a major recruiting hub on preview days for high school students. Furthermore, this lab is also utilized during the annual Science Olympiad for the Game-On event which is a game design competition for high school students. The equipment that will be purchased through the STEP funding will support and boost undergraduate and graduate work in the area of video game design.

Impact to the student body

Based on the provided justification, we expect the following impacts on the student body:

- Improving computer science student's abilities and expertise in the area of video game design, and computer graphics. This grant will also support increased enrollment in classes related to this area. We have 515 students enrolled for Fall 2023 and out of these approximately 28% (144 students) have declared game design as their concentration.
- Enhancing student skills by avoiding time to deal with slow outdated computers. Some students complain that their laptops are more powerful than these old computers.
- Enabling the Computer Science program to enrich current concentrations (e.g. video game) by allowing new possible projects (utilizing this new equipment) for students. This will attract more students to the Computer Science and will increase the number of enrollments in the program.
- Supporting graduate and undergraduate students who need computing resources not available in other labs in the department/university. This includes students from scientific computing concentration (about 18 every semester), students in the Virtual reality class (15-20 students), students in the graphics class (10-20 students).

B) Projected lifetime of enhancement

We believe that the computers purchased can work perfectly for at least 5 years. After that period, we can possibly upgrade the components in the computer and make it usable for another 3-5 years (total 8 to 10 years).

C) Person(s) responsible for

a. Implementation

Implementation will be carried out with the help of the Computer Science program system administrators (Mr. Troy Leger), Dr. Arun K. Kulshreshth, and their undergraduate and graduate students.

b. Installation

Installation will be carried out with the help of the Computer Science program system administrator (Mr. Troy Leger), Dr. Arun K. Kulshreshth, and their undergraduate and graduate students.

c. Maintenance

Maintenance will be carried out with the help of the Computer Science program system administrator (Mr. Troy Leger), Dr. Arun K. Kulshreshth, and their undergraduate and graduate students.

d. Operation

The operation will be carried out with the help of the Computer Science program system administrator (Mr. Troy Leger), Dr. Arun K. Kulshreshth, and their research lab students, which includes both undergraduate as well as graduate students.

e. Training (with qualifications)

Dr. Arun K. Kulshreshth, and their research team members that will include undergraduate and graduate students. Also, a general training document will be prepared to teach others on how to access and work with the system.

f. Service Level Objectives (SLOs) supported by this grant proposal

Based on the STEP program plan for 2021-2026, this grant proposal directly supports the following service level objectives (SLO):

- **SLO-4** – Enhance open use labs with technology that allows students to fulfill coursework requirements.

    - We will equip the VGDD lab with new computers which will help them fulfill course requirements.
- **SLO-5** – Create marketable graduates through a comprehensive employment plan.
    - The enhancements made to VGDD lab will allow students to develop both knowledge and experience, making them more competitive in the job market.

D) Grant proposal and justification

Our intention in requesting funding to purchase 11 computers and 22 monitors (27" size) is to equip VGDD laboratory with the latest technology by replacing/adding more machines to support our game design related classes. Currently we have 26 machines in the VGDD lab and out of these many machines (10+) are not graphically capable of supporting our game design classes. We have 28 students enrolled for FALL 2023 in the game design class (CMPS 327). Thus, we are requesting 11 machines as part of this grant proposal. Moreover, we request funds to equip each computer with two 27" monitors. For game design, it is a must to have two monitors, one for coding and one for visualizing the game graphics.

Moving forward, our classes will continue to grow in the near future. If this grant is approved, it will greatly contribute to the success of our department. Additionally, this equipment would be utilized by undergraduate and graduate students, both as part of projects and in working with researchers in the School of Computing and Informatics to gain experience with applications in several broad areas including human-computer interaction, virtual reality, and computer graphics. If funded, this grant request will allow students in the School of Computing and Informatics to gain valuable experience directly related to success after graduation.

Budget Proposal

1. **Equipment** **$35,200**

Equipment	Price per unit	Quantity	Total Price
Computers with high-end CPU and GPU. The price is based on Dell Alienware R15 computer with core i7 processor and Nvidia RTX 4080 graphics card.	$2,600	11	$28,600
27” monitors (2 for each computer). The price is based on Dell 27 Gaming Monitor - G2724D.	$300	22	$6,600
		Total	**$35,200**

2. **Software** **$0.00**

3. **Supplies** **$0.00**

4. **Maintenance** **$0.00**

5. **Personnel** **$0.00**

6. **Other** **$0.00**

TOTAL: **$35,200**

Previously funded STEP projects:

$21,150 STEP Grant (Fall 2018 Cycle) Dr. Christoph Borst and **Dr. Arun Kulshreshth**. Equipment for the CACS Virtual Reality (VR) Lab. Several VR capable machines, VR displays, and related accessories were purchased with support from this STEP Grant.

$9,500 STEP Grant (Spring 2018 Cycle) Dr. Arun Kulshreshth and Dr. Ashok Kumar. Equipment for the Video Game Design and Development (VGDD) Lab. Two projectors, one computer and several wireless game controllers were purchased with support from this STEP grant.