

UNIVERSITY OF LOUISIANA  
AT LAFAYETTE

STEP COMMITTEE

Technology Fee Application

Innovation Lab Enhancement  
**Title**

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**Name (Submitter)**

College of Education  
**Organization**

## ABSTRACT PAGE

**Title:** Innovation Lab Enhancement

**Date:** January 14, 2019

**Name (Contact Persons):** Douglas Williams

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**Dept/College:** Department of Curriculum and Instruction, College of Education

### **Abstract**

Since 2010, the Innovation Lab in the College of Education has provided innovative educational programs for children in grades K-5 (approximately 500 / year) and core field experiences for early childhood and elementary education majors.

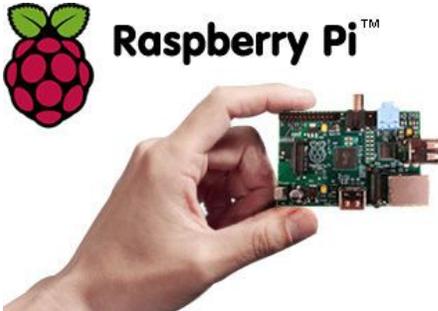
We have a gap in **computer science and robotics equipment to serve middle and secondary majors** (and community children for outreach). We are requesting funds to purchase key computer science (Raspberry Pi), robotics (humanoid robotic kits) and data sensors (PocketLab) equipment to serve middle/secondary education majors and older students.

# Hands-on Science Technology

## A. Purpose of Grant

This grant will enhance the equipment in the Innovation Lab for use in IRED 320, a required technology integration class that has approximately **200 education majors each year**.

This grant fill a gap we have in serving middle and secondary majors (and community children) with key computer science equipment, humanoid robotics sets, and data collection sensors.

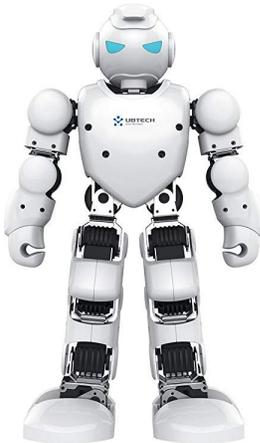


**Raspberry Pi™**

We are requesting **15 Raspberry Pi**, a small affordable computer for learning to code and to power inventions. This will meet the new national emphasis on preparing pre-service teachers to teach computer science. To further this



initiative, we have included **15 car kits** that have the needed components to build a driving vehicle powered by the Raspberry Pi.

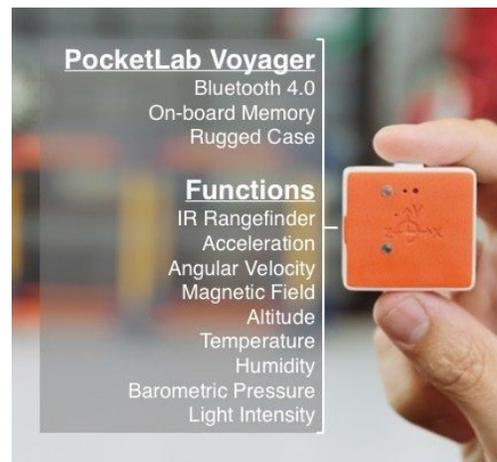


To deepen students interest and capacity in robotics and computer science, we have requested humanoid robotics kits including: **ROBOTIS Darwin-Mini**, **ROBOTIS BIOLOID**, and **UBTECH Alpha**. These humanoid robots are platforms that allow for the addition of sensors and coding. These exciting kits will provide great opportunities for our middle and secondary majors to deepen their skill in robotics and coding.

Collection and analysis of data is a key part of engineering and science. To better prepare our middle / secondary majors, we are also requesting the **PocketLab**

## **Voyager.**

This tiny sensor array can measure motion, light, magnetic fields, and weather, and you can attach an external temperature probe. This can be used in life science, physics, and engineering projects.



### **PocketLab Voyager**

Bluetooth 4.0  
On-board Memory  
Rugged Case

### **Functions**

IR Rangefinder  
Acceleration  
Angular Velocity  
Magnetic Field  
Altitude  
Temperature  
Humidity  
Barometric Pressure  
Light Intensity

Though these resources are mostly targeting older students (and middle/secondary majors), elementary majors will also be able to use the Pocketlab with children in grades 3-5 and the robot sets can be used in demonstrations by all education majors.

## **B. Impact on Student Body**

This proposal will impact approximately 200 education majors each year.

In Summer 2019, we plan on expanding our Summer Robotics Camps to include middle and high School students. This will provide opportunities for UL students and create vital outreach to our community.



Additionally, each year approximately **500 K-12 children** have opportunities to work with our education majors using the equipment. Some of the humanoid robots will be used in demonstrations for the younger children.

## **C. The Projected Lifetime Of Enhancement**

We expect this project to benefit students for at least the next three years.

## **C. Person(s) Responsible for Project**

- a. Implementation: Douglas Williams
- b. Installation: Doug Williams
- c. Maintenance: Doug Williams
- d. Operation: Aimee Barber, Douglas Williams
- e. Training: Aimee Barber, Douglas Williams

## **E. Qualifications:**

**Aimee Barber** is a former first grade teacher with a master's degree in Education of the Gifted and a bachelor's degree in Elementary Education. She is an instructor of Technology in the Classroom and Science for Elementary School where she works with pre-service teachers to bring innovative technologies into K-5 classrooms.

**Dr. Douglas Williams** has a doctoral degree in educational technology with an emphasis on educational multimedia. He has over 15 years of experience in the computer industry as a programmer, network administrator, and website designer. Douglas is an Professor in the College of Education.

## Budget Category Descriptions

Qty	Item	Description	Cost	
			Each	Total
2	<b>ROBOTIS Darwin-Mini Humanoid Robot</b>	Humanoid robot kit with open source embedded board for teaching engineering and coding.	500	1000
2	<b>BIOLOID Premium Robot Kit</b>	Comes with the CM-530 controller and AX-12A servos	1200	2400
2	<b>UBTECH Alpha 1 PRO Humanoid Robot</b>	Open source platform for robotics and coding	450	900
15	<b>Raspberry Pi Car DIY Robot Kit</b>	Engineering kit for use with Raspberry Pi. Build and program car using Python.	120	1800
15	<b>Raspberry Pi 3 Model B Motherboard</b>	Raspberry Pi Computer	35	525
15	<b>GoPiGo3 Robot Beginner Starter Kit</b>	GoPiGo3 Base Kit, Raspberry Pi, GoPiGo Servo Package, Distance Sensor, microSD Card, and Power Supply.	200	3000
1	<b>POCKETLAB VOYAGER CLASSROOM SET OF 10</b>	PocketLab Voyager is an all-in-one science lab that is capable enough for a professional engineer and simple enough for a 4th grade student. Voyager can measure motion, light, magnetic fields, and weather, and you can attach an external temperature probe.	1500	1500
				<b>\$11,125</b>

## Budget Proposal

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Length of Implementation	1	2	3
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(in years)			
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1. Equipment	11,125		
2. Software	0		
3. Supplies	0		
4. Maintenance	0		
5. Personnel	0		
6. Others	0		
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<b>TOTAL:</b>	<b>\$11,125</b>		

## **Timeline**

### **Year 1:**

Order and install hardware.

### **Previously Funded STEP Grants**

Williams and Barber had a STEP Proposal funded in the Fall 2018 cycle to expand replace aging robotics equipment for use by elementary majors.

Mr. David Lynch and Mrs. Louise Prejean had a STEP proposal funded during 2010 to provide software for the department computer lab.

Dr. Doug Williams, Mrs. Louise Prejean, Dr. Yuxin Ma, and Dr. Mary Jane Ford, had a STEP proposal funded during 2006 to provide software for a pedagogical laboratory for pre-service teachers.

Mrs. Louise Prejean, Dr. Yuxin Ma, Dr. Doug Williams, and Dr. Mary Jane Ford, had a STEP proposal funded during 2006 to provide hardware and software for an educational technology course.

Mrs. Louise Prejean, Dr. Mary Jane Ford, and Dr. Doug Williams had a STEP proposal funded during 2005 to provide software for the student computers in the undergraduate computer lab in the College of Education.

Dr. Sally Dobyns, Dr. Doug Williams, and Mrs. Louise Prejean had a STEP proposal funded during 2005 to provide EduCaching equipment for undergraduate and graduate classes.

Dr. Gail Dack, Dr. Ford, Dr. Doug Williams and Mrs. Louise Prejean had a STEP proposal funded during 2005 to provide video equipment for the student computers in the undergraduate and graduate computer labs in the College of Education.

Mrs. Louise Prejean, Dr. Mary Jane Ford, and Dr. Doug Williams had a STEP proposal funded during 2004 to provide robotics software and hardware for the student computers in the undergraduate computer lab in the College of Education.

Dr. Doug Williams, Mrs. Louise Prejean, and Dr. Mary Jane Ford, had a STEP proposal funded during 2004 to upgrade software in the undergraduate computer lab in the College of Education.

Dr. Mary Jane Ford, Dr. Doug Williams, and Dr. Susan Lyman had a STEP proposal funded during 2000 to upgrade the student computers in the undergraduate computer lab in the College of Education. The server was not upgraded as part of this grant.

Dr. Doug Williams, Dr. Mary Jane Ford, and Dr. Susan Lyman had a STEP proposal funded during the 2000-2001 funding cycle to install equipment and software in the College of Education Materials Center.

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