PROPOSAL TO THE COMPUTATION ADVISORY COMMITTEE FOR SUPPORT FROM STUDENT COMPUTER/TECHNOLOGY FEES

PROJECT TITLE:
New Overhead Projectors in Two GIS Labs

PROPOSING UNITS:
GIS Support and Research Facility, College of Design

PROPOSERS AND PROJECT PARTICIPANTS:

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GIS Support and Research Facility

Mike Miller
Director of Operations
College of Design

PROJECT LEADER:
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GIS Support and Research Facility
PROJECT METHOD AND PLAN

Geographic Information Systems (GIS) are systems of hardware and software allowing analysis of geographic data. Academics use the power of GIS in many disciplines to spatially enable their teaching and research. GIS is one of the fastest growing information technology careers for students, more of whom are realizing the benefit of having GIS as part of their studies. Iowa State offers a GIS minor and a graduate certificate program for students interested in GIS as a career. The ISU GIS Facility (GISF) supports GIS teaching and research in all of the university’s colleges and in more than 30 departments across campus.

The GISF, within the College of Design, manages the public GIS teaching computer labs located in 248 Durham Center and 526 College of Design. The teaching labs were created to address the specific GIS software instructional needs of the university community. The labs are used mainly by students during a specific GIS class and during open hours in support of their GIS class work. Outside of GIS class hours, the labs are open to any ISU student but preference is given to students in GIS classes if machines are at a premium.

This proposal is a request to provide updated projectors to both labs. The current projector in 248 Durham Center was purchased in 2006. The current projector in 526 College of Design is at least that old according to the prior managers of the lab. The GISF took over management in 2014 and has been providing software, hardware, and scheduling support.

GIS software produce highly-detailed data and color for visualization. 3D GIS data is one of the fastest growing areas of GIS with the expansion of LiDAR (Light Detection and Ranging) elevation data. Students and instructors have reported that there are times where detailed data are hard to see on the projector screen. Given the age and specifications, seen below, of the current projectors, higher-quality projectors will provide a great benefit to students taking classes in the two labs. Data that uses gradient coloration will better utilize the projector settings to make color differences more visible. Students will also be able to view highly detailed 3D data on the projector screen as the instructor teaches.

The labs have consistently had a minimum of 4 classes per semester for the last several years with increased interest in additional classes in the last year with the creation of the GIS minor. This has resulted in more students using the lab for more hours per week. Providing hardware capable of handling current GIS software will attract and serve students who want to incorporate GIS technology in their education.

These GIS teaching labs address the lack of specialized, dedicated GIS teaching facilities on the ISU campus. They provide a location for students to attend GIS classes and work on assignments using special GIS software with guaranteed times of accessibility. The GIS labs are open to the entire ISU community during the regular open hours of the Durham Center and College of Design, except for times when GIS classes are taught in the room. The facility in Durham has been very successful since its creation in 2002, and the facility in Design since we began managing in 2014, as attested to by instructors’ willingness to leave their own environment to teach in the lab and the many students who use the lab throughout the day and evening. Letters of support from instructors and students who use our labs can be found on the Techstarter website.
Enhancements and Updates

The table below shows the specifications of the current projectors for comparison.

Table 1. Summary of main specifications of current and proposed equipment

<table>
<thead>
<tr>
<th>Specification</th>
<th>Current 248</th>
<th>Current 526</th>
<th>Proposed Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine model</td>
<td>NEC VT-676E</td>
<td>NEC NP905</td>
<td>Epson PowerLite 1985WU</td>
</tr>
<tr>
<td>Resolution</td>
<td>1024 x 768</td>
<td>1024 x 768</td>
<td>1920 x 1200</td>
</tr>
<tr>
<td>Brightness</td>
<td>2500 lumens</td>
<td>3000 lumens</td>
<td>4800 lumens</td>
</tr>
<tr>
<td>Contrast Ratio</td>
<td>400:1</td>
<td>500:1</td>
<td>10,000:1</td>
</tr>
<tr>
<td>Lamp Life</td>
<td>2000 hours</td>
<td>2500 hours</td>
<td>3000 hours</td>
</tr>
<tr>
<td>Lamp Life Cycle</td>
<td>3000 hours</td>
<td>3500 hours</td>
<td>4000 hours</td>
</tr>
</tbody>
</table>

Support and Maintenance

The GIS teaching labs, located in 248 Durham Center and 526 College of Design, are currently equipped with required facilities including power and network connectivity (1 Gbps). 248 Durham has a security camera which is monitored by staff in Operations, Durham 95 during the day. The lab is managed by the GIS Support and Research Facility; direct support for the computer lab and services are primarily provided by the GIS Facility staff with occasional help from the technical staff of Information Technology Services.

BUDGET AND BUDGET JUSTIFICATION

Table 2. Full Itemized Budget (Entire Project Cost)

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Qty</th>
<th>Unit Cost</th>
<th>Central Pool</th>
<th>GISF /COD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epson PowerLite 1985WU</td>
<td>2</td>
<td>$1,699</td>
<td>$1,699 (Du 248)</td>
<td>$1,699 (Des 526)</td>
</tr>
<tr>
<td>ITS hazardous materials fee</td>
<td>2</td>
<td>1.75%</td>
<td>$30</td>
<td>$30</td>
</tr>
<tr>
<td>Labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation Materials and Labor</td>
<td>2</td>
<td>$700</td>
<td>---</td>
<td>$1,400</td>
</tr>
<tr>
<td>Total Cost</td>
<td></td>
<td></td>
<td>$1,729</td>
<td>$3,129</td>
</tr>
</tbody>
</table>

$1,729 is requested to assist with the purchase of two projectors for the GIS teaching labs. The College of Design and GISF will be responsible for the purchase of one of the projectors and all installation materials and labor.
Torchmate plasma table

This plasma table uses computer control software to cut metal, wood, and vinyl with various cutting processes. This table can be used in agricultural mechanics courses to teach metal cutting processes and computer aided design.

The demand for technological expertise among college graduates is constantly increasing. The introduction of a plasma table in the agricultural mechanics program would offer participating students new opportunities to learn how to use and work with advanced cutting processes as well as computer aided design. With this plasma table, students will be able to enhance their STEM skills when they create G-codes to cut signs, equipment parts, or class projects. While metal cutting is a Torchmate machine’s most recognized feature, the machine can also be used for intricate woodworking, routing, vinyl sign making, and drilling. This means that the machine can be used in multiple classes and for a variety of tasks, making it one of the most useful technologies a school can buy. Each machine has the most advanced technological features like, a touch-friendly user interface and integration of unlimited student licenses for the CAD and CAM software.

This table can also be used in cutting down materials cost for the welding units taught. The welding units taught in AGEDS 388, 450, & 488 require 2"x6" metal coupons for students to practice welding. One of the largest costs for the class is acquiring pre-cut welding coupons. The program has had large sheets of metal donated, which need to be processed down into the smaller size to become usable. Using traditional cutting methods such as hand torches or metal saws requires a large amount of time, expensive blades that wear out quickly from cutting such a large volume of metal, and often leads to sharp, crooked cuts.

We are requesting two Torchmate 4x4 Educational packages. These are turnkey machines that include the unlimited software packages for all students at ISU. The cost for the two packages is $35,000.

Supporting Webpages and Documents:


### Proposed by: John Rasty

- **Created:** 25 Jun 2015
- **Last Updated:** 25 Nov 2015
- **Status:** In Review
- **Funding Path:** All Available Funding
- **Likes:** 64 (like)
- **Volunteers:** 0 (volunteer)
- **Followers:** 5 (follow)
APPENDIX A

Request for advance approval of unusual* expenses

[*Categories of unusual expenses are listed in paragraph 2, Section III of the “Guidelines for Appropriate Expenditure of Income from the Student Technology Fee.”]

Category of unusual expense (from guidelines): This would be a hardware purchase. The wind tunnels are controlled by computers via USB and the computers collect data using NI LabVIEW software.

Projected Cost: $124,182.

Description: Purchase two Armfield computer controlled wind tunnels for ME 335 Fluids Lab

Date(s) of proposed expense: November 2016

Justification*: A purchase request for two computer controlled wind tunnels from Armfield has been submitted to accommodate the increased student load for the ME 335 Fluids Lab. We have purchased similar equipment for this lab in the past that compliments the LabVIEW software applications needed for data collection. This new request will be an expansion of lab equipment needed to accommodate a 25% increase in student load and compliment the small format we have established in this lab by replacing two 1960’s era outdated wind tunnels with modern computer controlled equipment. Since the new equipment needs to fit in a defined cell with other existing equipment, and the fact that they directly integrate with the existing LabVIEW computer software, this is the only source for that match. This equipment is the only source that will streamline three other experiments, which currently collect data in an archaic format that is not continuous or repeatable.

We purchased two of the Armfield wind tunnels in February of 2015 (ISU tag # 454130 and # 454131) with plans of purchasing four. The remaining two units were deferred due to funding. The class load has again increased and the need for the additional two units is now warranted. These machines are critical to instruction and are technology driven in application.

*(Please attach PIQ of employee if requesting greater than 50% of base salary support from CAC.)

Requested by: _______Nate Jensen_________

College approval: __________________________________