CAMPFIRES NOT REQUIRED

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Abstract — *The question parents have asked over the last couple of decades is "Where can I send the children during the summer?" Summer camps bring thoughts of sitting around a campfire in the great outdoors hundreds of miles away from civilization, but some campers and parents are seeking alternative summer experiences. During the last five summers, the Computer Graphics Technology faculty at Purdue University has hosted a Computer Graphics Camp for high school students. Approximately 100 students travel each year from around the United States to West Lafayette, Indiana, for a weeklong stay on the campus of Purdue University. Throughout the week the students explore a variety of computer graphics software in the laboratories, take tours of companies that produce or use graphic works, and participate in some fun and educational activities in the evenings. This paper will discuss the goals of the camp, the weekly schedule and most importantly, some of the trials and tribulations that occur when working with high school students.*

Index Terms — *Computer Graphics, High School Students, Summer Camp, Technology.*

INTRODUCTION

The Purdue University - Computer Graphics Technology Department prepares visually oriented students who are interested in creating and managing the production of computer graphics for a wide range of industry. Students enrolled in the Computer Graphics program can select from the following disciplines: Construction Graphics Communication, Interactive Multimedia development, Computer-Aided Design, or Computer Animation. The department consists of nineteen faculty members at West Lafayette, the main campus, and five more faculty at the Purdue Statewide Technology Programs throughout the state (see Figure 1). There are approximately 500 undergraduate students enrolled at West Lafayette, 45 graduate students, and 175 undergraduates in the statewide system. The Department of Computer Graphics strives to prepare students to be the nation's best practitioners, managers and leaders of applied computer graphics. The department is also recognized as a national leader through its diverse faculty, staff, and students, and its excellence in learning, discovery and engagement.

FIGURE. 1
PURDUE UNIVERSITY, WEST LAFAYETTE (CIRCLED) AND THE STATEWIDE TECHNOLOGY PROGRAMS.

One of the activities that the department engages in is a Computer Graphics Summer Camp for high school age students. This camp provides students with hands-on sessions in fields such as Computer Animation, 3D Solid and Surface Modeling, Web Development, Digital Publishing, Computer Game Development, Technical Illustration, Engineering Graphics and many other aspects of computer graphics.

COMPUTER GRAPHICS SUMMER CAMP

The question parents have asked over the last couple of decades is "Where can I send the children during the summer?" Summer camps bring thoughts of sitting around a campfire in the great outdoors hundreds of miles away from civilization, but some campers and parents are seeking alternative summer experiences. During the last five summers, the Computer Graphics Technology faculty at Purdue University has hosted a Computer Graphics Camp for high school students. Approximately 100 students travel each year from around the United States to West Lafayette, Indiana for a weeklong stay on the campus of Purdue University.

The goal of the camp is to attract students who are interested in Computer Graphics and expose them to the Computer Graphics Department at Purdue University. During the week, the students are introduced in a stress-free,

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non-competitive environment to software such as Photoshop, FreeHand, Flash, Rhinoceros, 3D Studio MAX, as well as a variety of other tools. Finally, the students are challenged in each classroom to create projects that are outlined either by their instructor or themselves.

The Computer Graphics Camp is geared towards high school sophomores or juniors, but freshman and seniors have attended. High school students should be thinking about future career options that will be available upon graduation. What better way to get the students interested in their future than to jump start their professional education with a general introduction to all areas of computer graphics?

The general demographics of the students are extremely diverse. Most are based in the United States with the majority coming from Indiana and its neighboring states, Kentucky, Ohio, Michigan and Illinois. (See FIGURE 2) There have been several students from as far away as Hawaii, Puerto Rico and Alaska. There were even a couple of French foreign exchange students from a high school in Chicago. From north to south and east to west, the students bring to Purdue their diverse background knowledge of graphics.
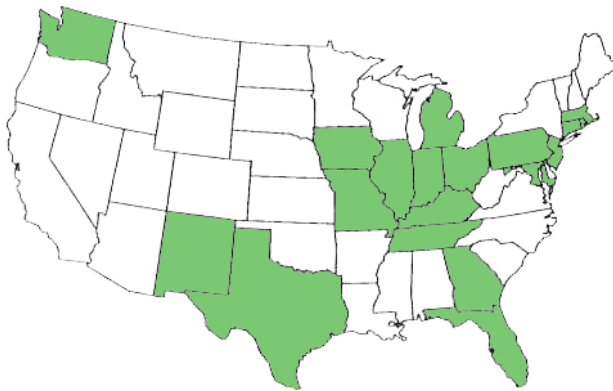

FIGURE. 2
STATES IN WHICH STUDENTS HAVE PARTICIPATED IN THE CAMP.

SCHEDULE

The camp, which is scheduled for mid June, runs from Sunday to the following Friday. The students are divided into groups of twenty-two, the number of computers in the Purdue computer lab. There are either four or five groups in a typical summer camp. Each group has two graphics session a day lasting three hours with a noon lunch break and an evening activity. (See FIGURE 3) The designated lunch break gives the student time to eat and either explore campus or go back into the computer lab for some independent work time. After supper, the group is walked to an evening activity.

Monday, June 17, 2002		White Team
7:00 am	Walk-up Call	
7:30-8:00 am	Breakfast	
9:00-Noon	Session 1	FreeHand
Noon-1:30 pm	Lunch	
1:30 pm-4:45 pm	Session 2	T-Shirt Design
5:00 pm-6:00 pm	Dinner	
6:30 pm-9:30 pm	Evening Activity	Physics Show & Campus Tour

FIGURE. 3
OVERVIEW OF ACTIVITIES FOR ONE TEAM

During the week at camp, students participate in computer sessions in the morning and afternoon, rotating through a series of seven computer graphics topics:
1. Vector Graphics – Software utlized: FreeHand
2. Raster Graphics – Software utlized: Photoshop
3. 3D Modeling – Software utlized: Rhinoceros
4. Aniamtion – Software utlized: 3D Studio MAX
5. World Wide Web – Introduced to HTML coding
6. Animation for the Web – Software utlized: Flash
7. T-Shirt Design

Each session takes place in a computer laboratory setting with all the necessary software and hardware to complete projects presented by their instructor. All of the students are provided with disks, binders, copies of projects, and other miscellaneous items that are needed in the classroom.

The seven areas give the students a general introduction to various areas of computer graphics. This curriculum design works effectively with most students, although some demonstrate less enthusiasm about the multiple areas. Some students come to the summer camp with the simple goal of concentrating on one component of computer graphics, and that goal is usually the expansion of their knowledge of animation. It seems that most students attend the camp for a general introduction to computer graphics, but a few just want to expand their knowledge of specific software products. Based on the student evaluations the animation, web, and 3D modeling sessions were selected as the favorites this year.

The following is a sample graphics session in the 3D Modeling. The instructor introduces a software package called Rhinoceros (Rhino). Rhino is a 3-D NURBS modeling program for Windows that is extremely easy to learn and use (www.rhino3d.com). First on the agenda is to introduce the interface and the transformation tools. A file containing a few primitives is given to the students. Using this file the students are asked to move, copy, rotate, and scale the objects. This task allows them to become

acclimated to an interface containing a top, front, side and perspective view of the objects in the scene. After a quick introduction to the interface and the transformation tools, the students start working with solid geometric figures like spheres, cubes and cones. They are encouraged to use the primitives to create a rough shape of simple objects like castles, trains, robots, and spaceships. Once they become comfortable with the interface, transformations and primitives, they are introduced to Spline based modeling using revolve and extrude to create 3D geometry. The students are then asked to construct objects such as goblets and decorative vases. The final task of the session is to create some type of building, toy, or character using some of the modeling methods introduced. (See Figure 4)
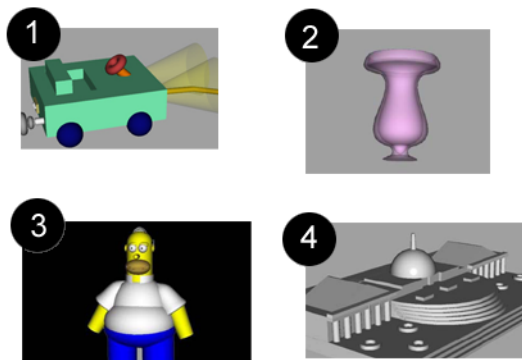

FIGURE. 4
3D MODELS CREATED BY THE STUDENTS IN THE 3D MODELING SESSION.
1.   TOY CAR CREATED WITH PRIMITIVES
2.   VASE CREATED WITH SPLINES
3.   HOMER SIMPSON CHARACTER CREATED WITH PRIMITIVES
4.   STATE HOUSE CREATED WITH PRIMITIVES

In addition to the classroom sessions the campers enjoy recreational activites in the evening. Some of the activities that the students take part in or attend are listed below:
1.   Purdue Campus Tour
2.   Animation Festival
3.   Chemistry and Physics Show
4.   Swimming Party
5.   Billiards and Bowling

The Chemistry and Physics Departments entertain the students with explosive shows highlighting some of the Laws of Chemistry and Physics. Purdue also has many recreational areas including their Olympic Swimming Facility and a Billards and Bowling Hall in which the students can relax and socialize with their fellow-campers. In fact, the billards and bowling evening activity ranked on the student survey as one of the favorites during the camp. The bowling and swimming allow them to release some of the constrained energy. The movie allows them to see computer animations created by past and present Computer Graphics Technology students and animators from around the world. It also gives the students an insight as to what they might accomplish.

One day during the week the campers are taken on a day-trip to Indianapolis, Indiana or Chicago, Illinois to tour industrial and business sites specializing in computer graphics. On these tours the students see first hand the cutting edge of computer graphics and the technology associated with it. The last couple of years the students have toured the Indianapolis Children's Museum which houses the IMAX movie theater. The staff at the Children's Museum also gives the students a tour of their in-house sign shop where all of the exhibit graphics are taken from concept to reality. From there the students visit the Indianapolis 500 Speedway Museum so they can view technology at its best. Finally the day is ended with a visit to the Holcomb Observatory in order to see the stars and the universe. The organizers of the camp have packed this day with tours of sensational places in addition to introducing the campers to businesses that use computer graphics.

Finally, the week is wrapped up with an Awards Banquet that the students' parents, friends, and family are invited to attend. After dinner the camp staff shows a slide presentation of photos that were taken throughout the week to give the attendees a chance to see activites in which the campers participated. Each student that successfully completes the week at camp receives a certificate of completion and is entered into a drawing for free computer related items ranging from mouse pads to printers.

ROLL CALL & CAMP GUIDELINES

Keeping track of 100 campers is not an easy task. All students must attend each and every session and activity at the camp. In order to ensure that all campers are in attendance, roll call is taken in the morning after breakfast, at each computer graphics work session, after dinner before the evening activity, and then once again before the students are dismissed to their floors for the night. Although the students are responsible for getting to every activity, for security reasons roll call is done in every class. If a student does not report for roll call and is not located immediately, the Purdue Police Department is notified that a camper is missing. At this time a search team is sent out to find the missing camper. Once the camper is found the student is dismissed from the camp and their parents are called and asked to make the appropriate travel arrangements for the student to return back home. It is the camp organizers' responsibility to safeguard the students for the week, and they take that responsibility very seriously.

During the five years that the camp has been offered at Purdue there have been very few discipline problems. The first night of the camp the Director reviews the rules and safety regulations for the camp. The main rules are:
1.   All campers must attend each and every session at the camp. In an effort to ensure that any camper who does not report to an event is safe, the Purdue

Police Department will be notified immediately it is discovered that the camper is missing.

2. Smoking is not allowed in any building on the campus or at any camp events.
3. Alcohol and illegal drugs in any form are prohibited on the Purdue campus. Violations must, by university bylaw, be reported to the Purdue Police Department.
4. Misconduct toward another member of the camp, or a faculty member, (such as physical or verbal abuse) will not be tolerated. Violators will be excused immediately from the camp for the remainder of the week.
5. Campers who are discovered to be in restricted areas of the dorm or other areas designated as "Off Limits" by university officials and/or camp faculty members will be dismissed immediately from the camp.

After the rules of the camp are reviewed with the students, there is no hesitation by the couselors to take appropriate action if a dicipline problem arises.

RAMPING UP FOR THE CAMP

The coordinators of the camp start preparing about nine months in advance. The camp is advertised in a number of different venues. A letter of invitation is sent to every High School Counselor in Indiana, Ohio, Illinois, Michigan, and Tennessee. An advertisement is also placed on the Computer Graphics Technology website. The other means of advertisement is by word of mouth. Most professors pass along the word at every conference they attend; so the camp is broadcast fairly well. Applications go out to high school counselors in January and are accepted to within two weeks of the start of camp. During this time, other planning occurs.

The planning for the camp is as complex as any conference function. There are scheduled meetings with organizers of food preparation, housing, swimming, bus transportation, field trip organization, and evening activities administrators. Each administrator must adhere to the guidelines Purdue has set for them, and the Computer Graphics Campers must follow those rules. The planning takes approximately two hours per day starting in January right up to the start of the camp.

The camp requires a large commitment from the Computer Graphics faculty and staff. Each graphics session must obviously have an instructor that knows the software and technology that is being introduced as well as chaperones for the evening activities and the day trip. The dormitories at Purdue are staffed with counselors, but the camp is also required to have supervision in the dorms for the campers at night. There are also the little things that can require extra help; for example, most days sack lunches are provided outside of the technology building instead of requiring the students to walk back to the dining room at the dormitory. Having someone who is willing to drive to pick up and deliver the lunches saves quite a bit of time. The organizers of the camp have also recruited undergraduate and graduate students who are attending summer classes or that are on campus for the summer to help out when extra supervision is required.

ASSESSMENT

The last two years of the camp the coordinators decided that the students should have an opportunity to voice their opinions about the camp and the activities in which they participated. The students were asked during the Friday morning's final graphics session to fill out a survey of approximately twenty questions. The questions basically cover the living facilities and dining services, the graphics sessions, the evening activities and the day trip. Each student was asked to rank these areas on a scale from one to ten – ten being excellent and above expectations. A few short answer questions were included at the end of the survey:

1. What other subjects or software would you like to see taught at the camp?
2. What was your favorite activity?
3. If you could change one thing at the camp, it would be...

Other comments were also included by the students on the back of the evaluation sheet. This past year 82 of the 90 campers returned their evaluations. The campers ranked the camp slightly above average on all aspects that were surveyed. In 2001 the results were similar – all slightly above average. The coordinators agree that the camp is meeting the expectations of the students.

Based on the student's comments, there are some areas that could be considered when developing next year's lab sessions. Some students would like to see an introduction to computer programming. Others would like a session on graphic freeware, for example GIMP, which can be downloaded from the internet. This would give them a chance to use graphics software at home without spending the high dollar value for the software that we use in the laboratory. One of the other comments that was included in the written section concerned the amount of roll calls – the coordinators agree that there is no way that the number of roll calls can be decreased. Basically the students want their freedom, but some control must be kept by the adults and supervisors of the camp.

CONCLUSION

The Purdue University Computer Graphics Department has taken the initative to introduce computer graphic to high school students in a structured but stimulating atmosphere. The mix of education, evening activities, social interaction, and promotion of computer graphics works extemely well in

capturing the minds of this age group. During the week the campers do not get bored with one aspect of the schedule because there is a variety of technologies to learn. The summer camp gives everyone a chance, instructors included, to learn and grow from the experience. Some of the students come to the camp with refined skills in a particular graphics area, but they quickly discover a lack of general overall graphics knowledge. The camps diverse opportunities allow the students a flexible learning environment to develop additional innovative graphic skills. The camp organizers know that most parents are concerned about their children's welfare, education and future success. It is logical that they should select a summer activity that promotes social interaction and an interest in higher education.

REFERENCES

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