

# Project Plan: IPRO 351

## Virtual Reality: Developing an Advanced Immersive Visualization Environment at IIT

Professor: Bob Krawczyk

### Members

Michael Abdul  
Robert Chang  
Madhur Merchant  
Johannes Smith

Eliza Birek  
Ibrahim Habib  
Gerald Norby

### **Objectives**

The main objective of the Spring 2005 IPRO 351 team is to develop a business plan for the installation of a virtual reality facility on the IIT Main Campus. Implementation of the plan will consist of three primary objectives over the semester. First the team will research current virtual reality institutions and applications. Questions to be addressed include:

- What is virtual reality and what are the current systems out there?
- What applications can virtual reality find on the IIT main campus?
- How much will it cost to install a virtual reality facility on campus?
- What vendors provide virtual reality services in the area?
- What universities already own virtual reality facilities?
- What can virtual reality contribute to IIT?
- Who would use virtual reality on campus?
- How long will it take to implement a virtual reality system at IIT?

Second the team will investigate how a VR installation can be funded based on an analysis of the initial space and cost requirements. The team will further investigate potential sources of funding and develop a budget for a system that could be assembled by a student team and developed into a virtual reality facility on campus.

Finally the team will develop plans and specifications for such a system, including a long range plan for how to integrate virtual reality into teaching at IIT. Stages of the plan will possibly include visualization of models and data already available, dynamic models of scientific processes, system-to-person interactive models, and person-to-person constructive models.

## **Background**

Since the early 1980s, the concept of virtual reality has been looked upon with great interest by academia and industry alike. First coined by Jaron Lanier, virtual reality is the use of computer graphics in combination with interactive devices that together provide the illusion of immersion in a virtual environment. The first such system, the Head-Mounted Display was introduced commercially in 1989 and consisted of a device mounted on the head that would display the virtual environment to the wearer while simultaneously tracking movement of the head. Today more advanced systems include the BOOM and CAVE systems.

Today virtual reality has found many applications. It has been used to create interactive architectural and scientific models, immersive controlled environments for psychological studies, and virtual environments for military and medical training. It has even found a niche in the entertainment industry. Within academia, universities such as Loyola and the University of Illinois at Chicago currently operate virtual reality facilities. It is believed that such a facility would also benefit the IIT Main Campus.

## **Method**

The initial focus of this project will center on research into the potential of a virtual reality system on the IIT Main Campus. Two groups will be formed:

### The Product Group

The product group will attempt to answer the questions mentioned in the objectives by conducting research in journals and on the web. In addition, the group will speak to the departments on campus to ascertain the perceived need for a virtual reality facility on campus. Finally, the team will locate and visit local VR installations in order to experience firsthand the range of potential applications. These may include the Aurora Sci-Tech Museum, Argonne National Laboratory, and the University of Illinois at Chicago. The group will also speak to vendors in order to obtain more detailed specifications and price ranges on VR technology.

### The Resource Group

The resource group will investigate potential sources of capital by examining available grants and resources. The sources the group will look at will include federal and university funding. Commercial options such as a charge-per-play entertainment program will also be examined. The resource group will be in charge of identifying grants that fit the goal of this IPRO and determining how best to apply for those grants.

Later a business plan including a summary of the costs and an analysis of the potential of a virtual reality facility on campus will be written by the entire IPRO team and presented. Finally the business plan will be expanded into a long-term plan for the installation of a virtual reality facility on campus for a future IPRO to continue work on.

## Expected Results

The two major outputs of this project, other than the research data gathered, are the business plan and the recommendations of the long-range plan for integrating virtual reality into the IIT curriculum. Ideally the IPRO will obtain funding to begin work on the implementation of a virtual reality facility on campus.

## Budget

Budget costs will include admittance fees to the Sci-Tech Museum and gas fare for our visits to locations inaccessible by train. In addition, copies may be required for publicity and other paperwork.

Museum Admittance Fee	\$7 x 9 People =	\$63
Copies		\$50
Gas (2 Round Trips)		<u>\$50</u>
Total		\$163

## Schedule

The work is divided roughly into three phases: research into virtual reality and sources of available funding, the review and evaluation of all data found, and the creation of a business plan and long-term plan. A tentative schedule with the deadlines set for the phases is listed below, along with the due date of several IPRO particulars.

<u>Step #</u>	<u>Objective</u>	<u>Finish by/Date</u>	
Step 1:	Research Virtual Reality and Available Sources of Capital	Mar	25
Step 2:	Midterm Report Due	Mar	25
Step 3:	Review and Evaluate Research Found	Mar	30
Step 4:	Draft Business Plan and Long-Term Plan	Apr	27
Step 5:	Presentation and IPRO Day	Apr	27

## Roles

Team Leader, Project Facilitator  
IPRO Office Liaison  
Budget

Robert Chang  
Gerald Norby  
Gerald Norby

### Product Group

Group Leader  
VR Research  
Applications

Johannes Smith  
Johannes Smith  
Robert Chang  
Gerald Norby

Competition

Eliza Birek

### Resource Group

Group Leader  
Federal Grants  
University Funds  
Other Capital

Madhur Merchant  
Ibrahim Habib  
Michael Abdul  
Madhur Merchant

### Documentation

Log  
Project Plan  
Midterm  
Business Plan

All Members  
Robert Chang  
Currently Unassigned  
All Members

IPRO Website

Currently Unassigned

Oral/Poster

Robert Chang  
Johannes Smith