

**Center for Internship, Volunteerism and Entrepreneurship in
Computer Science (CIVECS)**



Department of Computer and Information Sciences
Indiana University South Bend

An Initiative to Enhance Job Opportunities

for

College Graduates at Indiana University South Bend

Funding Source:

IUSB's Lilly Endowment Grant
for reducing brain-drain in Indiana

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Background

Since autumn 1994, the Department of Computer and Information Sciences has been offering an internship [1] program to students with junior and senior standing. The students enroll for up to 3 internship credits per semester and work in a supervised position at an approved organization. The requirements for a typical 3 credit internship can be satisfied by working for a minimum of 15 hours per week for a period of approximately 4 months (one semester). During this period the intern is jointly evaluated by his or her supervisor at work and the internship director at IU South Bend.

One goal of the internship program has been to develop and maintain a mutually beneficial alliance between our department and the Michiana business community. This alliance has provided our students with the opportunity to experience the demands and excitement of solving real-world problems. Companies have benefitted from student and faculty expertise, and many have recruited our most talented students. The feedback received from our regional industry has been beneficial in improving and refining our course content and our academic programs.

The current structure of the internship program requires a weekly meeting between the intern and the internship director at IUSB. During this time the intern will submit his or her weekly report [2], discuss the progress and/or setbacks encountered at work and seeks advise from the internship director. In addition, the director will identify and assign topics for further research by the intern. During the course of a typical internship, the intern will write 3 to 5 short research reports and one comprehensive paper [3] on a topic which is related to their work, and accessible to the computer science students at IU South Bend.

Even though, the current internship structure has produced an excellent opportunity for a number of our alumni, our program does not offer adequate opportunities for all the students who may wish to take advantage of this educational experience. This is primarily due to excessive time required to maintain the internship relationships with various organizations, and the amount of time necessary for one-on-one weekly meetings. Furthermore, the current program, requires the interns to find a position, interview, negotiate salary and have their own transportation. Although these activities resemble the real world in terms of locating and finding a job, they do restrict the number of student who may take advantage of this educational experience.

Center for Internship, Volunteerism and Entrepreneurship

This proposal has three major objectives. First, it seeks to improve and expand the scope of the internship program in computer science to include and promote volunteerism and service learning. Second, it helps to address the problem of 'Brain Drain' which exists in the state of Indiana. Third, we hope to increase and enhance the high-tech job opportunities by developing an incubator for new software engineering startups in Indiana.

Expanding the Scope of the Internship Program

We propose to create a new *Center for Internship, Volunteerism and Entrepreneurship* (CIVECS). The main objective of this initiative is to expand the current internship opportunities. Currently, the computer science department offers internship opportunities to approximately 3 to 5 students per year. With this initiative, we hope to increase this number to accommodate up to 30 students per year. This number represents approximately 50% of the students that are qualified to take internship class in a given year.

In order to accommodate the increased student limits, we also propose to broaden the kind of organization that can participate in the internship program. The overwhelming majority of the organizations who have participated in our internship program have been for-profit corporations. These include organizations such as TCU, Motorola, AM General, NIBCO, Bayer Corp., Biomet Corp., and Syscon International. On occasion, we have placed interns at not-for-profit as well as government organizations such as the Community Resource Center of South Bend, University of Notre Dame, the Michiana Islamic Sunday School, the Indiana Toll Road and the Indiana Bankruptcy Court.

We hope to accommodate more 'Not-for-Profit', as well as financially strapped 'new startup' organizations. Of course the department will continue to offer and expand the internship opportunities for 'Traditional Interns'. Traditional Interns will continue to seek a job outside the university¹, will work for an average of 15 hours per week, and will attend the internship class to join the discussion, make presentations, and report on their activities at work. However, the new initiative will include what we call the "CIVECS" Internships. The CIVECS Interns will work for IUSB's *Center for Internship, Volunteerism and Entrepreneurship*. These interns will be assigned a number of individual tasks as well as team oriented projects by the internship director (see below for the structural details of the CIVECS internship). Similar to Traditional Interns, CIVECS Interns are expected to spend approximately 15 hours per week toward the completion of their tasks; they will attend the internship class to join the discussion, make presentations, seek guidance and report on their activities². The tasks or projects for these interns, will come through the CIVECS Request For Proposal (RFP) process.

A CIVECS project will typically involve projects related to non-profit organizations³. In most cases, the resulting solutions will be placed in public domain under an 'Open Source' licensing agreement.

Stopping the Brain Drain and Increasing Entrepreneurship in Indiana

Although, close to 75% of our alumni choose to remain and work in the region, Northern Indiana is still affected by the

¹ Approved by the internship director as a position that exhibits value and is a supervised position

² CIVECS director will work with the Office of Career Services to offer sessions on job-seeking and interviewing skills.

³ Individuals and departments within the university are also encouraged to propose their projects.

statewide brain-drain, and can benefit from reducing this trend. We hope that our CIVECS initiative, will provide a much needed source of expertise and technology transfer to Indiana's startup companies and the entrepreneurs who run them. In addition, the initiative will help to stimulate growth in local and regional companies, and help support the regional non-profit organizations.

We also hope that this growth in turn will create additional high-tech, high-paying jobs for our state. It is worth noting that the 2002 average income for the state of Indiana was \$28,240 per year [4], and the average annual income for employees in high-tech positions such as computer science is approximately \$45,000.

Perhaps the greatest potential for economic and job growth in Indiana will rest on its new and innovative startup companies. Access to high-technology and knowledgeable workforce is crucial to the success of these fledgling companies. Given the right environment and technological infrastructure, inevitably a percentage of these startups will become successful. It is these small businesses which will eventually create the largest number of future jobs in our state.

Finally, we hope that some of the students participating in the CIVECS program will develop the necessary knowledge, skills, insight and connections which will allow them to become future entrepreneurs of our state.

Basic Outline of the Internship Course (Y398)

Students in the CIVECS program reinforce their existing skills learned in earlier classes. They also learn new skills that will prepare them for future employment. Aside from basic system analysis and design skills, the interns will receive substantial exposure to job seeking, technical and profession skills. An outline is provided below:

Job Seeking Skills:

- Resume preparation, job seeking and interviewing skills.

Technical Skills:

- Data modeling and database design
- Process modeling and application development
- Human computer interaction and user interface design
- Software Engineering

Professional Skills:

- Professional writing and documentation skills
- Presentation tools and skills
- Brainstorming skills
- Interpersonal skills
- Project and time management skills
- Working within a team (leading and following skills)
- Ethics (Examination of ethical issues facing the information technology professionals)

The Structure of CIVECS Internships

The CIVECS initiative addresses the needs of three categories of organizations in our region. The first category is the traditional for-profit internship organizations, second is the not-for-profit organizations (both public⁴ and private) and the third category will include the financially strapped new startup organizations.

Each month, the computer science department receives an average of 2 or 3 calls from local and regional non-profit organizations asking for help with technology oriented problems. These requests span a range of activities such as web site design, databases design, computer training, programming, analysis and design of complete systems, network design, and many others. The goal of CIVECS is to develop a mechanism for not-for-profit entities as well as new Indiana based startup companies to bring forth their technology needs and requests⁵. These requests will be evaluated to determine their feasibility and fitness for the CIVECS program. If a request appears to be promising, the CIVECS director will work with the Primary Investigator (PI) to put together a project plan which defines the scope of the problem, a timeline, and a set of deliverables suitable for release to interns. The project will then be assigned to one or more interns for analysis, design and implementation. The CIVECS director as well as the PI will oversee the implementation of the project.

Students participating in the program will enroll for 3 credits of internship. The CIVECS director will be offering CSCI Y398 Internship and Professional Practice, during Fall, Spring and at least one Summer session. Students who enroll in the internship course, will form teams of up to 3 individuals. The teams are given a project for the semester. As detailed above, projects will have a project scope, a project plan, a set of deliverables and a clearly specified time-line. At least two teams will participate on each project. At the end of the semester (or the project termination), the CIVECS director and the rest of the selection committee will hold a competition to evaluate the competing projects. Depending on the quality of the completed projects, one or more interns may be selected for nomination for the CIVECS scholarship.

Prerequisites and requirements for participating in the CIVECS initiative:

Students who participate in the CIVECS program must meet a number of requirements. These students must:

- 1) Declare major in computer science.
- 2) Achieve a cumulative GPA of 2.5 or higher.
- 3) Complete the prerequisite requirements for Y398 Internship and professional practice.
(C101 Computer Programming I, C151 Multi-User Operating Systems, C201 Computer Programming II, C243 Data Structures, C335 Computer Structures, and C308 Systems Analysis and Design).
- 4) Maintain full-time status at IUSB.

Disclaimer:

It is important to note that the university, the department of computer and information sciences and its interns will make no explicit or implicit guarantee as to the usability of the resulting software or hardware solutions. The completed project will be made available to the public under the 'Open Source' licensing agreement.

⁴ Including departments in the university.

⁵ CIVECS requests will be in the form of a proposal (RFP)

CIVECS Request for Proposal (RFP) Process

Process:

- The department will solicit proposals from local and regional non-profit organizations.
- Each year, the CIVECS director evaluates and selects one or more such proposals suitable for CIVECS and service learning experience. These proposals are evaluated to determine their feasibility and fitness for the CIVECS program.
- Selected proposals are further analyzed and clearly defined by the CIVECS director and the Primary Investigator.
- If appropriate a budget is created.
- A project plan and a set of deliverables are developed. The project plan must define the scope of the problem to be solved and clearly specify a timeline for the project.
- The project is then assigned to one or more CIVECS teams for analysis, design and implementation.
- The CIVECS director oversees the implementation of the project and the PI serves as a external consultant to the project.

Outcome:

- A series of status reports or other deliverables.
- A final presentation (made to the target non-profit agencies).
- The resulting software will be made available to the public as a public domain software, governed under the 'open source' licencing agreement.
- In certain cases, the result of such projects may be publishable.

Formation of the Selection Committee

The selection committee is composed of the CIVECS director, two other members of the computer science faculty, the Primary Investigator and one external members from the community. The external member is typically related to the project at hand.

Summary

The requirements for a typical 3 credit internship in computer science can be satisfied by working for a minimum of 15 hours per week for a period of approximately 4 months (one semester). During this period the intern is jointly evaluated by his or her supervisor at work and the internship director at IU South Bend. The current structure of the computer science internship program requires a weekly meeting between the intern and the internship director at IUSB. During this time the intern will submit his or her weekly report [2], discuss the progress and/or setbacks encountered at work and seeks advise from the internship director. In addition, the director will identify and assign topics for further research by the intern. During the course of a typical internship, the intern will write 3 to 5 short research reports and one comprehensive paper [3] on a topic which is related to their work, and accessible to the computer science students at IU South Bend.

The CIVECS proposal has three major objectives. First, it seeks to improve and expand the scope of the internship program in computer science to include and promote volunteerism and service learning. Second, it helps to address the problem of 'Brain Drain' which exists in the state of Indiana. Third, we hope to increase and enhance the high-tech job opportunities in Indiana by developing an incubator for new software engineering startups in Indiana.

The CIVECS initiative seeks to :

- 1) increase our capacity to offer internship opportunities to our students. Increasing both our traditional as well as CIVECS internships.
- 2) promote entrepreneurship in Indiana
- 3) promote community outreach and volunteerism by our students and faculty in computer science
- 4) provide technical services to Indiana's non-profit organizations
- 5) allow for more departmental and college level projects
- 6) serve as potential senior projects
- 7) improve technology transfer and access to faculty expertise
- 8) reduce the brain-drain in Indiana

Budget

We are requesting \$108,000 funding to award up to 27 scholarships within a 3 year period. The pool of candidates will be members of the CIVECS internship team whose project has won the project competition and was nominated for CIVECS scholarship.

In addition, we are asking for \$15,000 for equipment, and \$3,000 for supplies to support the CIVECS initiative.

Budget Item	\$ Cost Per Year	\$ Total Cost for 3 Years
9 Scholarship per year @ \$4,000 each	\$ 36,000	\$ 108,000
Hardware and Software for 6 workstations. (All equipment is purchased during the first year)	\$ 5,000	\$ 15,000
Supplies	\$ 1000	\$ 3000
Total	\$ 42,000	\$ 126,000

Budget Justification:

Scholarship:

Up to nine scholarships will be awarded per year using a competitive evaluation and selection process. (Up to 3 per semester). Each semester up to 3 teams will develop competing projects which will be evaluated by the selection committee. The selection committee is composed of the CIVECS director, two other computer science faculty, the PI and one external members from the community (typically related to the project at hand).

Hardware/Software:

We are requesting \$15,000 for equipment purchases to support the CIVECS projects

Supplies:

We are requesting \$1000 per year for supplies, presentation material, copying and other office expenses.

References

- [1] Computer Science Internship Web site at IU South Bend www.cs.iusb.edu/internship
- [2] Weekly report completed by interns in computer and information sciences at IU South Bend www.cs.iusb.edu/internship/weekly_report.html
- [3] This site holds a number of papers written by former interns in the computer science department. www.cs.iusb.edu/internship/papers.html
- [4] State of Indiana web site: <http://www.in.gov/dwd/inews/lmi.asp>
- [5] Open Source Initiative web site: <http://www.opensource.org/>

CIVECS - REQUEST FOR PROPOSAL (RFP)

Center for Internship, Volunteerism and Entrepreneurship Computer and Information Sciences Indiana University South Bend



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Organization Name:

Contact Person:

Title:

Address:

Tel:

Fax:

E-mail:

City:

State:

Zip:

URL:

Project Title:**Requested Completion Date:****Project Description:** (attach additional documents if necessary)

Signature

Date