

Concurrent Poker Player

Milestone Five

The Parallel Poker Team

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REVISION HISTORY

Date	Revision	Comment
11-06-09	1.0	Initial draft
11-09-09	1.1	Addressed Drew's comments

SIGNATURES

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Part I

Executive Summary

Usability testing helps developers identify whether usability goals are being met. This usability testing on the Rose-Hulman Institute of Technology [2] computer science/software engineering (CSSE) department's website consists of numerous key elements:

- Background Information - Includes the scenario from Milestone 3 [1] that helps explain the user's interaction with the poker application
- Interaction Architecture - A description of how the poker application is designed for user interaction
- Initial Interface Design - The current Rose-Hulman [2] CSSE department website design
- Usability Report - A report that describes the process, analysis, and findings of the usability testing
- Revised Interface Design - Suggestions for changes to the CSSE department website based on the results of the usability tests

Usability tests are very insightful, and they help developers improve their products' usability. This specific usability testing could potentially benefit the developers of Rose-Hulman's [2] CSSE department's website.

Part II

Introduction

Due to time constraints, the Parallel Poker Team chose to perform usability testing on Rose-Hulman's [2] CSSE department website instead of developing a prototype of the parallel application. The team felt that usability testing the CSSE website would benefit the whole CSSE department at Rose-Hulman [2]. These usability tests helped the Parallel Poker Team gain experience, so the team will be proficient when performing usability tests on the poker application prototypes. The information in this document can also be used as advice for the CSSE department website developers.

Part III

Background Information

1 Scenario

Mike had a chance to try out the poker application. The application had an empty card table with a large “Start” button in the center with a brief description of how the parallel and sequential players worked in the middle. He clicked on the “Start” button, and a popup appeared. The popup had settings on it, such as the number of players and the number of games. Mike set the number of players to three. He selected Player 1 as a parallel player, Player 2 as a sequential player, and Player 3 as a human player. On the same popup, he set the number of games to one. Once he was done setting his preferences, he clicked the “OK” button.

When the popup closed, the screen had place set for Players 1 and 2 on the left and right sides of the screen respectively. The deck was on the top of the screen, and Mike’s place was at the bottom of the screen. All players, including Mike, had a pile of chips next to their hands. Some of Player 1’s chips moved into the middle of the table, and Player 1’s total amount of money went from \$500 to \$490. The running total of the pot, which was displayed in the middle of the screen, went up to \$10. Then Player 2 contributed \$5 into the pot. As Mike watched, he noticed that the game status bar on the bottom of the screen stated that the big blind was \$10 and the small blind was \$5. The game status bar then displayed the message: “Players have placed pre-flop bets.” Then, cards were dealt to all three players.

Three pairs of cards were displayed on the screen. Players 1 and 2 had face-down cards. However, Mike’s cards were face-up. He had a five of clubs and a king of hearts. Next to Mike’s hand and chips were four buttons: “Call,” “Raise,” “Check,” and “Fold.” He noticed the game status bar changed to “Player 1 called. It took Player 1 8.254 ms to make this move.” as some of Player 1’s chips went to the pot. Player 2 also called. The game status bar also noted that Player 2 called and how long it took for Player 2 to make that move. It was Mike’s turn, and he wanted to call. So, he clicked the “Call” button. Five of his chips went into the pot, and his amount of money went down by \$25. Players 1 and 2 checked. The game status bar noted this. Mike checked by clicking “Check.”

Then, three cards showed up face up on the top of the screen next to the deck. They were the dealer’s cards. The cards were: a three of diamonds, a six of clubs, and a queen of spades. As Player 1’s chips went into the pot, the game status bar displayed: “Player 1 raised \$20. It took Player 1 7.345 ms to make this move. The current bet is \$30.” Player 2 raised the bet another \$20, as the game status bar noted. Mike wanted to stay in the game, so he called by clicking the “Call” button. It was Player 1’s turn, and so Player 1 called. Player 2 checked. Finally, Mike checked by clicking “Check.”

A fourth card showed up face up on the top of the screen next to the other three dealer’s cards. It was a four of diamonds. Player 1 raised the bet by \$50, as specified by the game status bar. Player 2 called. Since Mike did not think he had a chance of winning, he decided to fold. So, he

clicked the “Fold” button. His cards on the screen flipped over, and the buttons to call, check, raise, and fold became grayed out. Player 1 checked, and the status bar updated correspondingly.

The fifth card was then displayed on the top of the screen. It was a ten of clubs. Player 1 raised \$50. Player 2 called. Then, Player 1 checked. Mike watched as the game status bar updated and the chips went into the middle of the table.

Since the game was over, it was time to show cards. Both Player 1’s cards and Player 2’s cards flipped over to show the face value. Player 1 had a five of diamonds and a queen of clubs. Player 2 had a three of spades and a two of spades. All the chips in the pot moved to Player 1’s side, and Player 1’s money total updated. Also, the game status changed to “Player 1 wins.” Mike watched as all of this happened.

Then, the statistics information at the bottom of the screen updated. These statistics included measures of efficiency such as the average time to make each move and the average number of possibilities considered. Mike viewed the statistics on the parallel and sequential players. In this case, the parallel player was more efficient. Mike enjoyed working with the poker application, and he decided to play again.

Part IV

Interaction Architecture

Below is the interaction architecture.

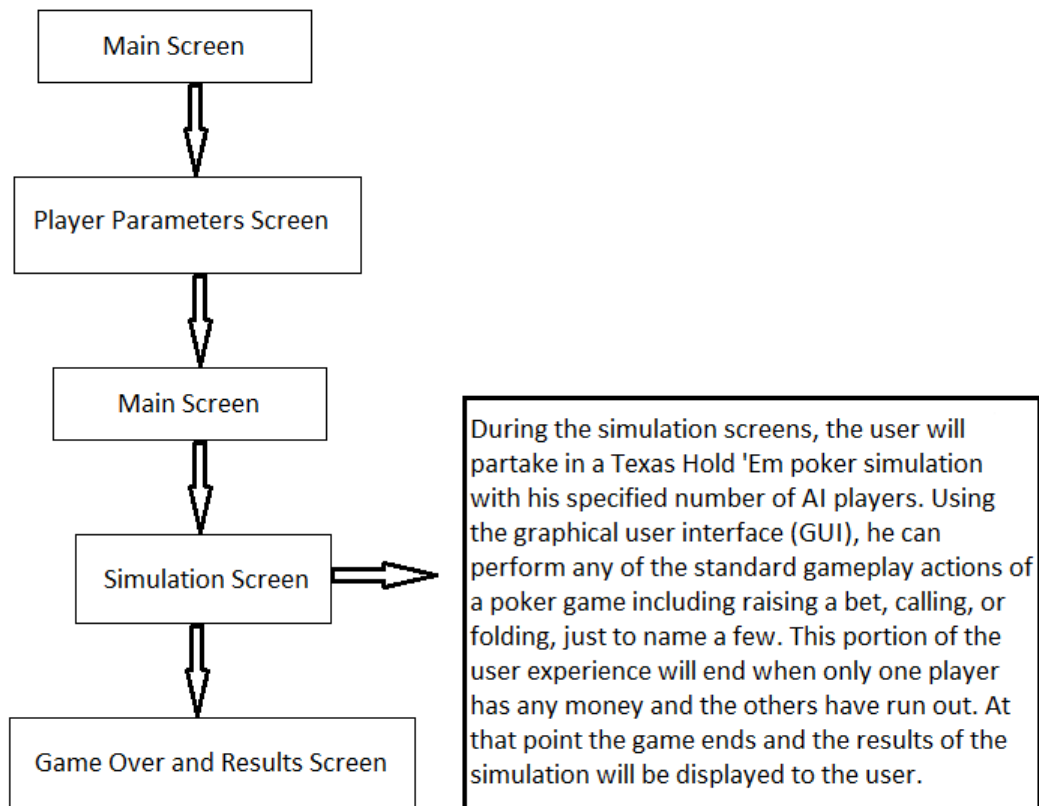


Figure 1: Interaction Architecture

This chart describes the basic flow of the screens that the user will experience while using the concurrent poker player system. The program begins with the initial setup screen. From there, the user clicks an option to enter the parameters for the different players. The player is then taken back to the main screen, where he clicks the “Start” button to begin the game. The screen then changes to the simulation screen. This stays essentially the same throughout the poker simulation, only updating to show the game state as well as all game information. Once the game has concluded, it takes the user to the results screen, where the user can review the results of the simulation.

Part V

Initial Interface Design

Here is the initial interface design.

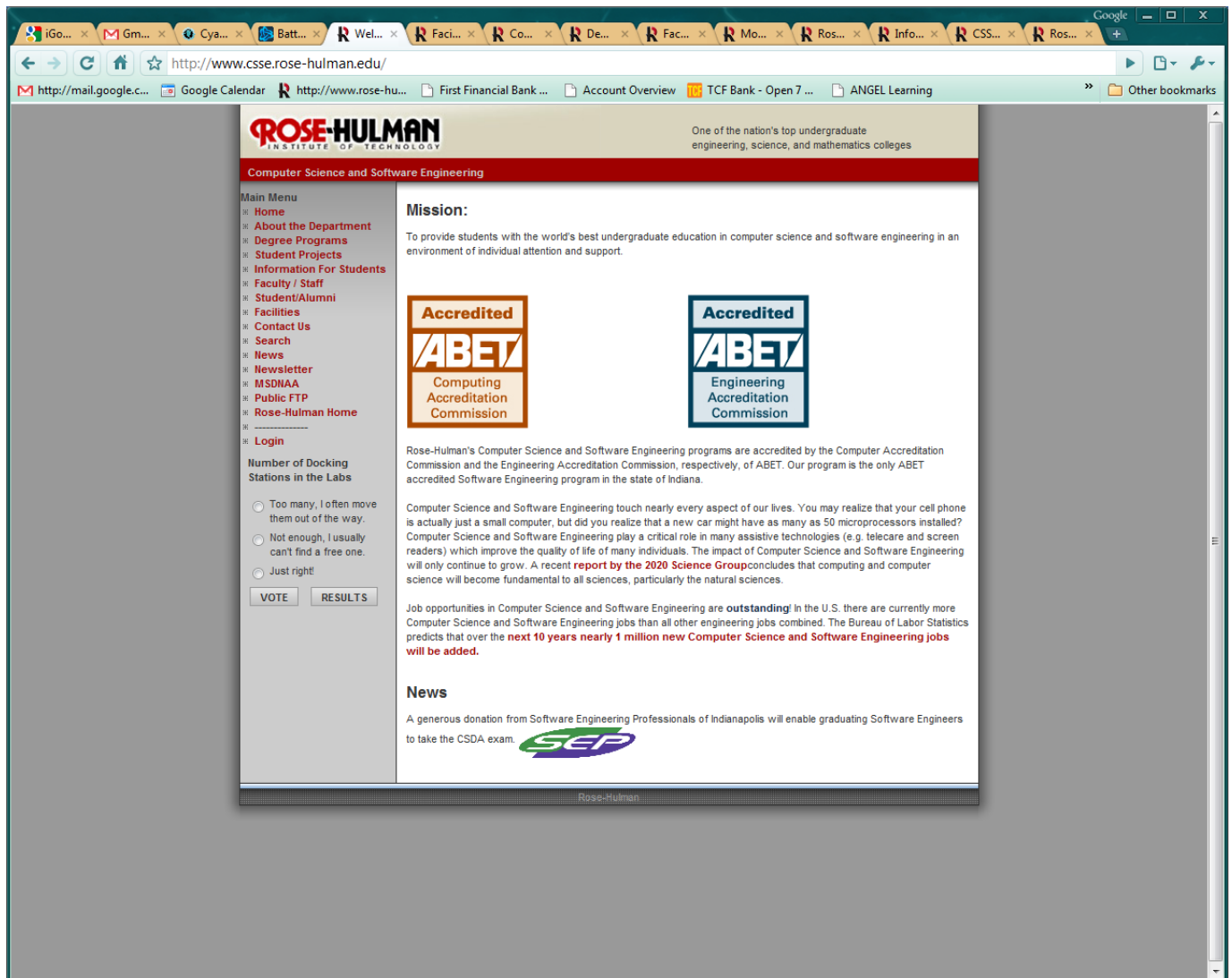


Figure 2: Homepage

Above is the homepage for the CSSE department. It has a general description of the department and its mission. On the left side is a list of links titled “Main Menu.” The list includes links to useful information about the department, such as degree programs, student projects, and faculty/staff. In the usability testing, the user begins each task at this homepage, because they would most likely be navigating from the homepage if they were looking for information in a real situation.

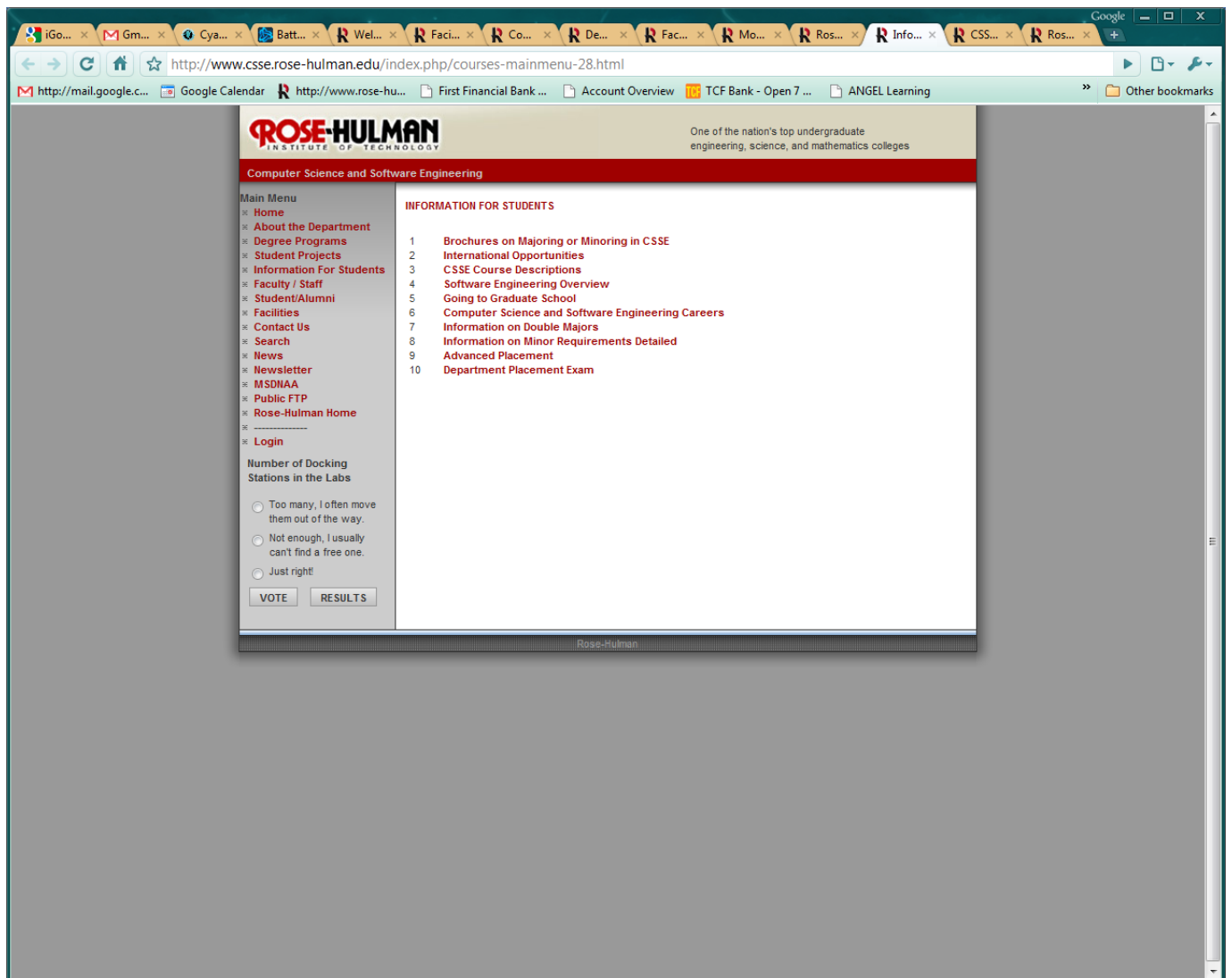


Figure 3: Information for Students

Above is the “Information for Students” page. This page has information that would be useful to students, whether they are computer science/software engineering majors or not. The page only consists of links to other pages. The links range from general information, such as graduate school information, to specific information, such as information on the double major requirements. In the usability testing, the users may find the degree requirements link here.

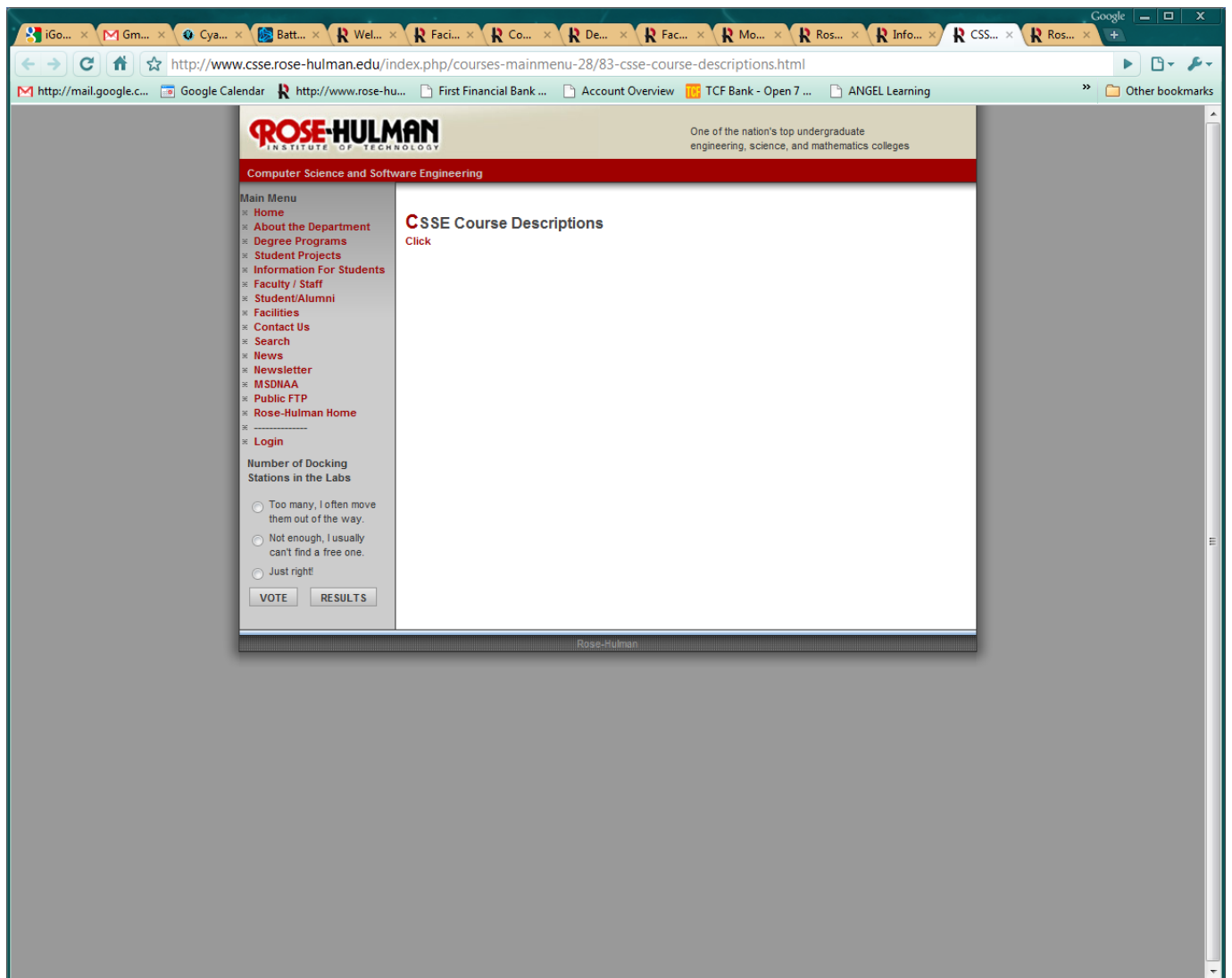


Figure 4: Course Description Page

Above is the “CSSE Course Descriptions” page. The site simply has a link that is titled “Click.” The user can click to move on to the actual course descriptions page.

The screenshot shows a web browser window displaying the Rose-Hulman Institute of Technology website. The browser's address bar shows the URL <http://www.rose-hulman.edu/Catalog0910/courses-compsci.htm>. The website features a navigation menu on the left with links such as "Mission, Vision, Guiding Principles", "Introduction to the College", "Faculty Directory", and "Campus Map". The main content area is titled "2009-2010 Undergraduate Bulletin" and "Course Descriptions - Computer Science and Software Engineering". It lists several courses with their descriptions and prerequisites.

ROSE-HULMAN INSTITUTE OF TECHNOLOGY
One of the nation's top undergraduate engineering, science, and mathematics colleges

2009-2010 Undergraduate Bulletin

Course Descriptions - Computer Science and Software Engineering

Professors Anderson, Bohner, Boutell, Chenoweth, Chidanandan, Clifton, Defoe, Laxer, Mellor, Mohan, Mutchler, and Wollowski

For current information on course offerings, see the department's web site:
www.cs.rose-hulman.edu

CSSE 120 Introduction to Software Development 3R-3L-4C F, W, S
An introduction to procedural and object-oriented programming with an emphasis on problem solving. Students will solve problems by developing software in both an interpreted language (Python) and a compiled language (C). Problems may include visualizing scientific or commercial data, interfacing with external hardware such as robots, or solving numeric problems from a variety of engineering disciplines. Procedural programming concepts covered include data types, variables, control structures, arrays, and data I/O. Object-oriented programming concepts covered include object creation and use, object interaction, and the design of simple classes. Software engineering concepts covered include testing, incremental development, understanding requirements, and teamwork.

CSSE 220 Object-Oriented Software Development 3R-3L-4C F,W,S Prerequisite: CSSE 120
Object-oriented programming concepts, including the use of inheritance, interfaces, polymorphism, abstract data types, and encapsulation to enable software reuse and assist in software maintenance. Recursion, GUIs and event handling. Use of common object-based data structures, including stacks, queues, lists, trees, sets, maps, and hash tables. Space/time efficiency analysis. Testing. Introduction to UML.

CSSE 221 Fundamentals of Software Development Honors 3R-3L-4C F Prerequisite: A score of 4 or 5 on the APCS A exam or permission of instructor
This course is intended for students who have sufficient programming experience to warrant placement in an accelerated course covering the topics from CSSE 120 and CSSE 220. This course will satisfy the prerequisite requirements for courses that have CSSE 220 as a prerequisite.

CSSE 230 Data Structures and Algorithm Analysis 3R-3L-4C W,S Prerequisites: CSSE 220 or CSSE 221 or a score of 4 or 5 on the APCS AB exam, and MA 112
This course reinforces and extends students' understanding of current practices of producing object-oriented software. Students extend their use of a disciplined design process to include formal analysis of space/time efficiency and formal proofs of correctness. Students gain a deeper understanding of concepts from CSSE 220, including implementations of abstract data types by linear and non-linear data structures. This course introduces the use of randomized algorithms. Students design and implement software individually, in small groups, and in a challenging multi-week team project.

CSSE 232 Computer Architecture I 3R-3L-4C F, W Prerequisites: CSSE 120 and ECE 130
Computer instruction set architecture and implementation. Specific topics include historical perspectives, performance evaluation, computer organization, instruction formats, addressing modes, computer arithmetic, ALU design, floating-point representation.

Figure 5: Course Descriptions

Above is the page with course descriptions for the CSSE department. Here, students can find descriptions of all courses in the department. The courses are ordered by course number, from CSSE120 to CSSE499. In order to get to a specific course number, the user can scroll down or use the "Ctrl + f" function on their browser.

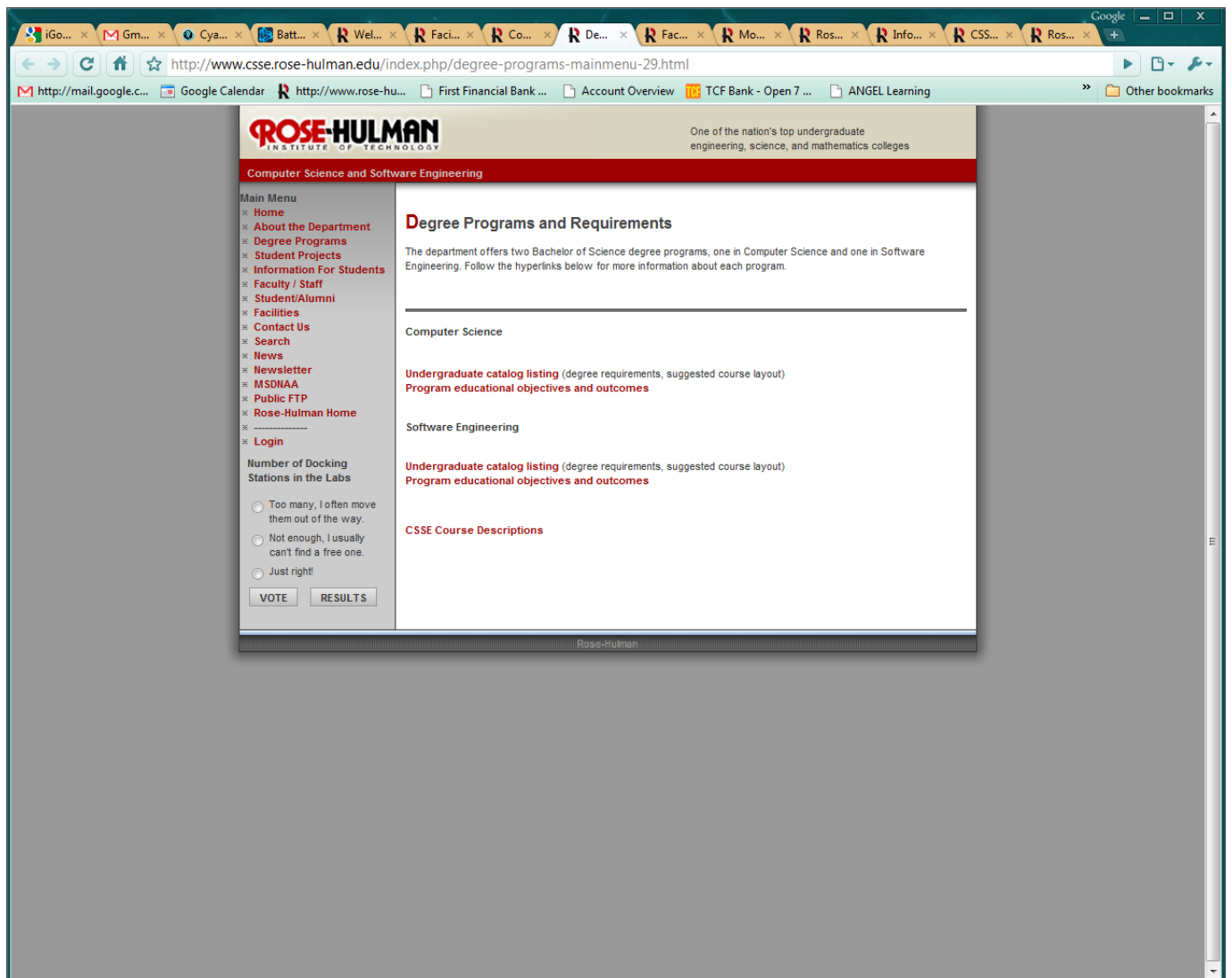


Figure 6: Degree Programs and Requirements

Above is the “Degree Programs and Requirements” site. The site has a brief description on the top of the page. It has two separate sections - one for computer science and one for software engineering. Below those two sections is a link to the course descriptions.

Summary of graduation requirements for the computer science major

To complete the major in computer science a student must complete the following:

1. All required courses listed by number in the schedule of courses above: CSSE120, CSSE220, CSSE230, CSSE232, CSSE304, CSSE332, CSSE333, CSSE371, CSSE374, CSSE473 or MA473 and CSSE474 or MA474, and either CSSE487-9 or CSSE494-6 or CSSE497-9; MA111, MA112, MA113, MA275, MA221, MA375, MA381; ECE130, ECE332; PH111, PH112; CHEM105; RH131, RH330; CLSK100.
2. Sixteen credits of additional computer science courses numbered between 200 and 492. No more than four credits may be at the 200 level, and none of the credits may be from CSSE372, 373, 375, 376, and 377. The student's academic advisor must approve the courses to satisfy this requirement. (Use of computer science courses numbered 490 through 492 to fulfill this requirement must be approved by the department head).
3. Eight credits of technical elective courses selected from the courses offered by the Department of Mathematics or the Department of Electrical and Computer Engineering. Courses used as technical electives must have been approved for such use by the computer science department head. A student pursuing a second major, minor, or certificate program in an area not offered by the Department of Mathematics or the Department of Electrical and Computer Engineering may substitute one or more technical electives counted towards the second major, minor, or certificate program for MA/ECE electives. These substitutions require approval of the computer science and software engineering department head.
4. Four credits of science electives, which can be any CHEM, PH, or AB courses not already required for the computer science major.
5. Twenty-eight credits of additional courses offered by the Department of Humanities and Social Sciences. The distribution of these courses must meet the requirements of the Department of Humanities and Social Sciences.
6. Twenty credits of free elective courses. These courses must have the approval of the student's academic adviser. Free electives may be selected from any Rose-Hulman course except Military Science and Aerospace Studies.
7. A total of 192 credits.

Area Minor in Computer Science
Advisor: Dr. Laxer

Students majoring in Software Engineering may not receive a Computer Science minor.

Required courses
CSSE120 Introduction to Software Development
CSSE220 Object-Oriented Software Development
CSSE230 Data Structures and Algorithm Analysis
Four additional courses in computer science numbered above 200. None of these may be CSSE 371-377.

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5500 Wabash Avenue / Terre Haute, IN 47803 / (812) 877-1511
Quick Links

Figure 7: Degree Requirements

Above is the “Degree Requirements” site. There is a long description of the major requirements, and then a very short description of the minor requirements. There are clear headings, but no way to skip to different sections of the page.

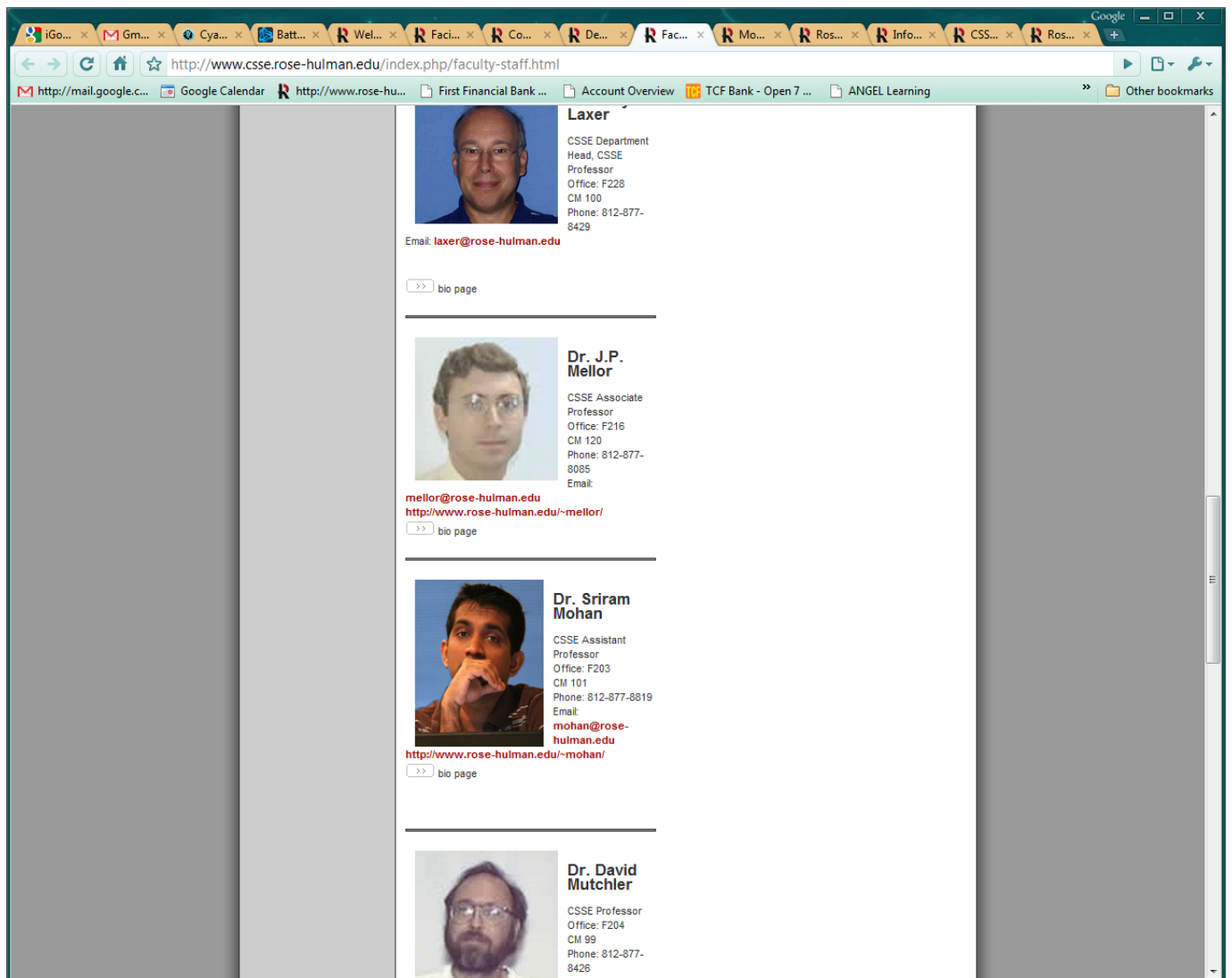


Figure 8: Faculty and Staff

Above is the “Faculty/Staff” page. It has photos of each member of the faculty and staff. Each person also has a link to a “bio page” at the bottom of their photo. Next to each picture is the person’s name, title, and contact information.

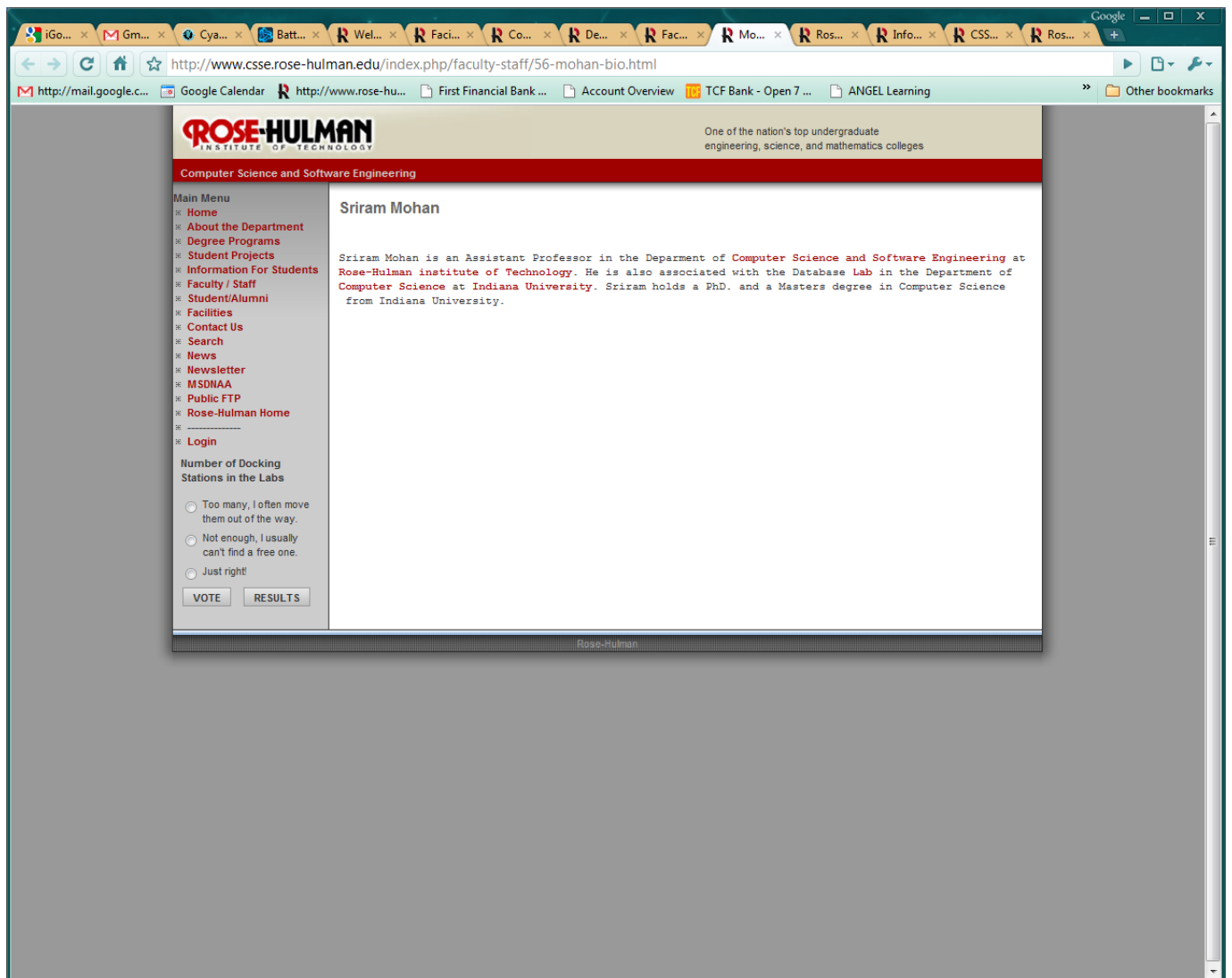


Figure 9: Sriram's Bio

Above is Sriram Mohan's biography page. It concisely describes Dr. Mohan.

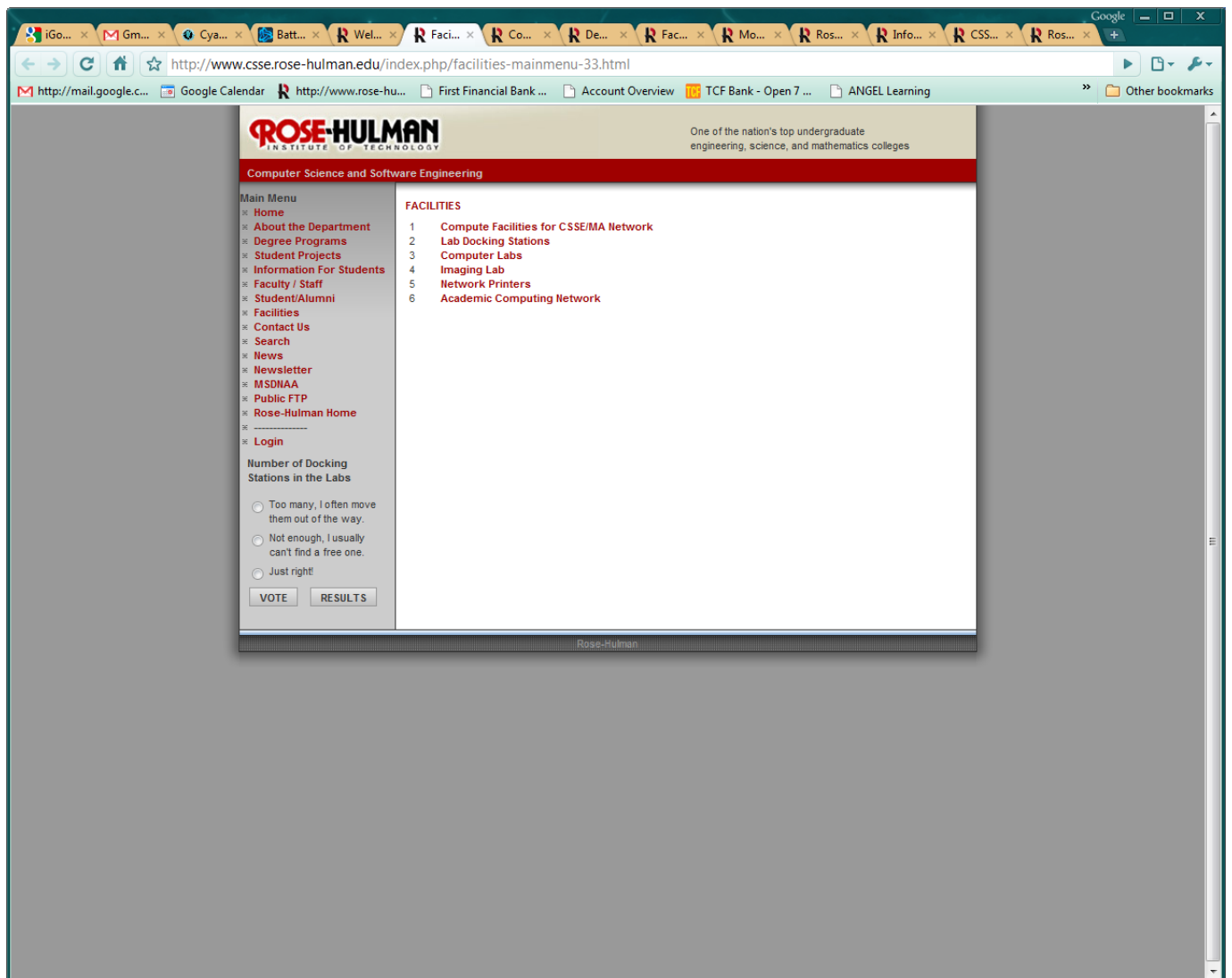


Figure 10: Facilities

Above is the "Facilities" page. This page has links to information about all the different facilities that CSSE students can use. This page only consists of links. In the usability testing, the users will use this page to find information about the computer science lab's hours.

ROSE-HULMAN
INSTITUTE OF TECHNOLOGY

One of the nation's top undergraduate engineering, science, and mathematics colleges

Computer Science and Software Engineering

Computer Labs

The Rose-Hulman Computer Science and Software Engineering Department is located in the top floor of Moench Hall. We have two general purpose Computer Labs located in rooms F217 and F225. The doors are open during the following times:

Monday - Thursday	7:30 a.m. - 9:30 p.m.
Friday	7:30 a.m. - 5:30 p.m.
Saturday	Locked all day
Sunday	6:30 p.m. - 9:30 p.m.

CSSE students may use their student ID card to gain access any time.

F217

- open to all students during the day, and CSSE students can open the locked doors in the evening with their student IDs.
- Equipment:
 - Docking Stations for HP and Dell laptops
 - HP dc5750 Windows XP workstation with a flatbed scanner
 - Mac Pro
 - HP LaserJet 4200dn printer
- Empty tables with power and network connections are available for laptop users.
- An overhead projector and retractable screen.

F225

- open to all students during the day, and CSSE students can open the locked doors in the evening with their student IDs.
- Equipment:
 - Docking Stations for HP and Dell laptops
 - HP dc5750 Windows XP workstation
 - Mac Pro with a flatbed scanner
 - HP LaserJet 4200dn printer
- There are 4 cubicles for Senior Project teams.
- Empty tables with power and network connections are available for laptop users.
- An overhead projector and retractable screen.

D219

- secured lab (students enrolled in the course have access to the lab; their student ID cards activate the electronic lock)
- Equipment:
 - 12 **HP dc5750** (3.4GHz, 2GB RAM) from Compaq/HP
 - HP LaserJet 4200dn printer
- Tables with power and network connections are available for laptop users.
- An overhead projector and retractable screen.

Figure 11: Computer Labs

Above is the site on the computer labs in the CSSE department. It has a clear description of the lab hours in a grayed table on the top of the page. Below is information on each lab organized by room number. The rooms are not in alphabetical order; they seem to be in order of popularity among students.

Part VI

Usability Report

2 Usability Report

The Rose-Hulman Institute of Technology [2] Computer Science and Software Engineering website is used as a resource to learn about the Computer Science and Software Engineering department's faculty, classes, degree information, and other topics. The purpose of the website is to answer questions that any person, whether a Rose-Hulman [2] student or not, might have about the department. A basic evaluation of the current website interface was performed through a set of usability tests. The following is a report on the usability testing that the Parallel Poker Team performed, including the testing process, the findings recorded, and analysis and presentation of the findings.

3 Process

This section describes the process of the usability tests. Throughout the study, a test script was read by the evaluator (can be found in the appendix). Each user went through this process:

1. Signed an informed consent form
2. Had up to 10 minutes to explore the CSSE website
3. Completed the four tasks one by one
4. Completed a questionnaire

3.1 Informed Consent Form

The signed consent form explained the purpose and procedures of the study. It also included statements about the age of the participant and the confidentiality of the results. Finally, it mentioned that the user could withdraw from participation at any time. All of these statements were necessary to make the study ethical and the participant comfortable. The consent form can be found in the appendix.

3.2 Interaction with the CSSE Website

Each user had up to 10 minutes before the tasks to explore the website. When the user was finished exploring, they let the evaluator know that they were done. Afterward, the users had to complete four tasks:

1. Please find the course description for CSSE371, which is titled "Software Requirements and Specification."
2. Please find the information on how to complete a computer science minor.
3. Please find the biography of Sriram Mohan, who is a professor in the computer science department.
4. Please find what hours the computer science labs are open.

3.3 Questionnaire

After each user completed the tasks, they completed a one-page survey about the website. The survey had basic information about the user, such as the age, gender, and major of the student. The second section of the questionnaire was about internet use. Users selected how often they used the internet for different purposes. The final part of the questionnaire used a Likert scale and asked the users to rate different aspects of their experience with the CSSE department website. At the conclusion of the section, there was a blank space for users to write down any recommendations they had for the website. This questionnaire can be found in the appendix.

4 Analysis

The data collected was analyzed by considering a number of factors. Of particular interest were the time taken to complete each task, the reason for task termination, and the number of pages visited before finding the information desired by the task.

4.1 Pre-Test Questionnaire

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Age	20	20	20	20	20
Gender	Male	Male	Male	Male	Male
Academic Status	Undergraduate	Undergraduate	Undergraduate	Undergraduate	Undergraduate
Majors(s)	SE/CS	ME	SE	CPE	CS
Performs Research/ Information Gathering	Daily	Daily	Daily	Daily	Daily
Uses a Rose-Hulman Website	Daily	Daily	Weekly	Daily	Weekly
Uses the CSSE website	Weekly	Never	Weekly	Monthly	Monthly

All the participants happened to be male 20-year-olds. Three were majoring in computer science or software engineering. All of the participants used the internet daily to perform research and gather information, and most of them used the Rose-Hulman [2] website daily. There was a wide spread of results for how often the participants used the CSSE website, with results ranging from “Weekly” to “Never.”

4.2 Task Details

Participant	Task	Time to Perform Task (m:ss)	Reason for Task Termination	Number of Pages Visited
1	1	0:52	Successful Completion	2
1	2	1:22	Successful Completion	6
1	3	0:32	Successful Completion	2
1	4	0:27	Successful Completion	2
2	1	0:42	Successful Completion	4
2	2	1:59	Successful Completion	4
2	3	0:20	Successful Completion	2
2	4	0:33	Successful Completion	3
3	1	0:23	Successful Completion	2
3	2	0:22	Successful Completion	2
3	3	0:33	Successful Completion	3
3	4	0:33	Successful Completion	3
4	1	0:32	Successful Completion	2
4	2	0:45	Successful Completion	3
4	3	0:24	Successful Completion	2
4	4	0:23	Successful Completion	2
5	1	0:39	Successful Completion	2
5	2	1:40	Successful Completion	10
5	3	0:23	Successful Completion	2
5	4	0:15	Successful Completion	2

All the participants were successful in completing every task. The times to complete the tasks ranged from 15 seconds to 1 minute and 59 seconds. The number of pages visited for each task varied significantly as well. Usually the participants only visited two or three pages to complete a task, but some participants visited up to 10 pages.

4.3 Task Summaries

Task	Mean Time to Complete (mm:ss)	Minimum Time to Complete (mm:ss)	Maximum Time to Complete (mm:ss)	Frequency of Successful Resolution
1	0:38	0:23	0:52	5
2	1:14	0:22	1:59	5
3	0:26	0:20	0:33	5
4	0:26	0:15	0:33	5

The average times to complete the tasks were relatively consistent, with the exception of task two. This task was to find information on how to complete a computer science minor.

4.4 Post-Test Questionnaire

	SA	A	WA	WD	D	SD
The website is laid out in an aesthetically pleasing manner	0	3	1	0	0	1
The website is cluttered with excess and unnecessary information	1	0	1	2	1	0
I was able to locate Professor Mohan’s biography page easily	2	3	0	0	0	0
I feel that I could now find information on other CSSE professors easily	3	2	0	0	0	0
I was able to find the course description for CSSE 371 quickly and without trouble	2	1	1	1	0	0
I feel that I could now look up information on additional CSSE courses offered at Rose	3	2	0	0	0	0
It was difficult for me to locate information on how to acquire a Computer Science minor	0	2	2	0	1	0
It would be difficult for me to locate other degree information on the website	0	0	3	1	1	0
I had trouble locating the hours that the computer labs were open on the website	0	1	0	1	0	3
I would not be able to look up information for other computer science department resources	0	0	1	0	2	2
The website pages are confusing and difficult to understand	0	1	0	1	2	1
I prefer darker colors to lighter colors for the display of a website	0	1	2	1	0	1

Key:

SA = Strongly Agree

A = Agree

WA = Somewhat Agree

WD = Somewhat Disagree

D = Disagree

SD = Strongly Disagree

The participants’ ratings on the Likert scale [3] varied significantly. Overall, though, there are some clear trends. Most users were able to find the course descriptions and lab hours with little trouble. Users tended to describe the information on the computer science minor as difficult to find. They felt that the website was aesthetically pleasing for the most part. They all found that finding Sriram Mohan’s biography page was simple. Although the responses vary quite a bit, there are some clear trends in the data.

5 Findings

The actions of the users in completing the tasks of the usability tests and the feedback provided through the post-test questionnaire suggest that users could more readily find information on course descriptions and degree requirements if some alterations were made to the website. Most of the users were able to find the course description for CSSE 371 without much trouble, but several still suggested having a link to the CSSE course descriptions from the main page instead of as a link from another page linked to the main page. Most of the users also had trouble finding information on how to acquire a Computer Science minor and suggested that this information be setup in tables instead of a paragraph of information nested in other degree requirement information.

All users were able to find information on the computer science computer lab hours as well as Professor Mohan's biography page easily and quickly. One user did navigate to Dr. Mohan's personal page before locating his actual CSSE biography page. This could be attributed to ambiguity in testing instructions. Another commented on the main menu bar being very helpful for navigation. However, he still found it easy to navigate to pages that do not have this helpful link listing and ended up losing it as a resource. This can be addressed by attempting to keep a majority of the links and information within the domain of the departmental website as opposed to merely linking to other Rose-Hulman [2] websites.

Other feedback of the usability tests stated that the department website includes some ambiguous links which are difficult to recognize as to what information they are linking to. Analysis of the screen capture per user reveals that there is some difficulty in recognizing which links will lead to information on how to acquire a computer science minor. To address the issues raised from the usability testing, we suggest that the Computer Science and Software Engineering department adapt their website to create a more encompassing domain to avoid the necessity of navigating to other sites or domains in the Rose network and to go through the site map and reform link descriptors to decrease the ambiguity of some of the links on the website.

Part VII

Revised Interface Design

Based on the usability testing, numerous changes should be made to the CSSE website. This list only covers features relevant to the four specific task that were performed by each user. Therefore, the list will not address unrelated issues on the website, such as Claude Anderson’s “bio page” link going to Shawn Bohner’s biography page that simply has the word “Bio” on it.

1. A “Course Descriptions” link should be on the main menu.
2. The “Undergraduate catalog listing” link should have a clearer list of items that are in the catalog listing. For instance, the link could be:

Undergraduate Catalog Listing, which includes information on:

- Major requirements
- Minor requirements
- Sample four-year schedule
- Program overview

This way, there is a clear display of what information the Undergraduate Catalog Listing contains.

3. The minor information should be available under “Degree Programs” in table form for easy reading.
4. The “Information for Students” page should have a more organized layout. For instance, it could be:

Majoring/Minoring

- Major Requirements
- Minor Requirements
- Double Major Requirements
- Brochures on Majors/Minors (in PDF)

Courses and Placement

- Course Descriptions
- Advanced Placement
- Department Placement Exam

After Rose-Hulman

- Going to Graduate School
- Computer Science and Software Engineering Careers

All the bulleted items would be links to the appropriate pages. It is easier for the user to find the appropriate link in a categorized list rather than a long, unorganized list.

5. The “Facilities” page should be reorganized to make it easier to find information. For instance, it could be organized this way:

Computer Labs

- Hours
- Available Docking Stations
- Printers

Imaging Lab

- Hours
- General Information

Network Resources

- Compute Facilities for CSSE/MA Network
- Academic Computing Network

All the bulleted items would be links to the appropriate pages. Again, it is easier for the user to find the appropriate link in a categorized list rather than a long, unorganized list.

6. There should be more pictures on the website to make the links even clearer. For instance, the “Computer Labs” link could have a photo of the computer labs next to it, and the “Imaging Lab” link could have a photo of the imaging lab next to it. The images would help the users identify the links they want.
7. There should be a site map of the department’s website. A site map would help users find out where to look for specific information. There should be a link to this site map on the main menu. That way, it would be easily accessible for users who are not familiar with the website.

The key points are to make links available where they seem natural and to change long, unorganized lists into organized lists with categorical headings.

Part VIII

Appendix

6 Test Script

6.1 Introduction and Informed Consent

First of all, we want to thank you for participating in this study. The goal of this project is to evaluate the usability of the Rose-Hulman computer science department's website. The results of the study will be incorporated into a document for CSSE371, which will be read by a professor in the computer science department.

Have you ever used the computer science department's website before? You will be asked to use the computer science department's website to complete a series of four specific tasks. We ask you to please think aloud as you search for the information.

We will be videotaping what appears on the computer screen and your face. What you say as you search for the information will be recorded as well. Do not feel pressured to act a certain way because you are being recorded. The more normal you can act throughout the study, the better. We need you to review and sign this statement of informed consent. If you have any questions, we can answer them. If not, go ahead and sign it.

6.2 Procedure

The department website is used as a resource to learn about the computer science department's faculty, classes, degree information, and other topics. Its purpose is to answer questions that any person - whether a Rose-Hulman student or not - might have about the department.

The purpose of the study today is to explore the website's interface. We want to learn about aspects that could be improved or extra features that could be added.

We will give you four tasks. For each task, you will use the computer science department's website. Please remember that we are not evaluating you, but rather the website itself. Feel free to work on each task at a pace that is normal and comfortable for you. We will record how long it takes you to complete each task, but do not feel rushed. If any task takes you longer than 10 minutes, we will ask you to move on to the next task. For each task, you will start at the computer science department's website homepage.

Please imagine that each task is something that you or someone else needs to know. All answers are available on the website or via links that the website has. However, if you feel unable to complete a task or just want to stop, we will simply move on to the next task. Just let us know if that is the case.

Do you have any questions so far?

6.3 Exploratory Time

Before we begin the tasks, we'd like you to explore the department's website for as long as you want. As you explore, please think aloud by telling us your thoughts as you click on different links within the website. You are welcome to take up to 10 minutes. Let us know when you are done, and we will proceed.

6.4 Tasks

Please read this task aloud before you begin. After completing it, return to the computer science department homepage by clicking "Home" on the main menu.

We will now begin with the first task. Please remember to think aloud.

6.5 Prompts

- What are you thinking?
- Are you stuck?
- Tell us what you're thinking, please

6.6 Debriefing

Thank you for completing the tasks. We have a short questionnaire for you to fill out. Afterwards, your participation will be complete. If you have no other questions, go ahead and fill out the questionnaire now.

Closure

Thank you so much for participating in our study. We appreciate your time. Do you have any questions? Thanks again. Your participation is complete.

7 Informed Consent Form

Informed Consent Form – CSSE Website Study

I state that I am over 18 years of age and wish to participate in the evaluation study being conducted by Mark Jenne, Bennie Waters, Sarah Jabon, and Ian Roberts at Rose Hulman Institute of Technology.

The purpose of this study is to test the usability of Computer Science and Software Engineering department web page.

The procedures involved the monitored use of the Computer Science/Software Engineering (CSSE) website. I will be asked to perform specific tasks using the website. I will also be given a questionnaire about the site and my experience using it. In addition, the evaluators will observe my use of the CSSE website using the monitoring equipment in the CSSE department's usability lab.

All information collected in the study is confidential, and my name will not be identified at any time.

I understand that I am free to ask questions or to withdraw from participation at any time without penalty.

Signature of Participant

Date

Figure 12: Informed Consent Form

8 Questionnaire

CSSE Department Website Questionnaire Rose-Hulman Institute of Technology

Please circle the most appropriate selection or fill in the blank with a proper response:

Personal Information:

Age: _____

Gender: Male Female
Academic Status: Undergraduate Graduate
Major(s): _____

Internet/Web Experience:

Research, Information Gathering Daily Weekly Monthly Never
Use a Rose Website Daily Weekly Monthly Never
Visit the CSSE Department Website Daily Weekly Monthly Never

Please rate (check the appropriate box to show) agreement or disagreement with the following statements.

	Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
The website is laid out in an aesthetically pleasing manner.						
The website is cluttered with excess and unnecessary information.						
I was able to locate Professor Mohan's biography page easily.						
I feel that I could now find information on other CSSE professors easily.						
I was able to find the course description for CSSE 371 quickly and without trouble.						
I feel that I could now look up information on additional CSSE courses offered at Rose.						
It was difficult for me to locate information on how to acquire a Computer Science minor.						
It would be difficult for me locate other degree information on the website.						
I had trouble locating the hours that the computer labs were open on the website.						
I would not be able to look up information for other computer science department resources.						
The website pages are confusing and difficult to understand.						
I prefer darker colors to lighter colors for the display of a website.						
Please add any recommendations for changes to the overall design, language, or navigation of the website in the space below.						

Thank you for your participation in the testing of the CSSE department website.

Figure 13: Questionnaire

9 Glossary

- Likert scale - A type of scale often used in questionnaires that asks the participant to rate their level of agreement with a statement [3]
- Rose-Hulman Institute of Technology - An undergraduate engineering university in Terre Haute, IN [2]

References

- [1] Sarah Jabon, Mark Jenne, Ian Roberts, and Bennie Waters. Milestone Three, 2009.
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- [3] Wikipedia. Likert scale, 2009. http://en.wikipedia.org/wiki/Likert_scale.

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