

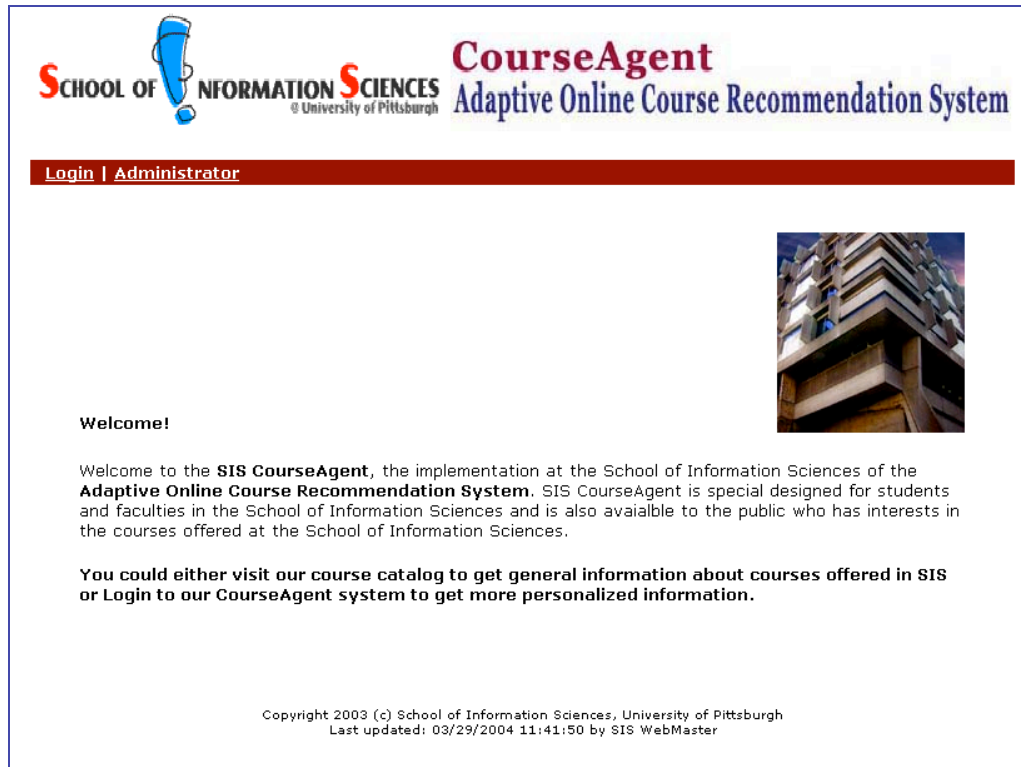
## **TABLE RELATIONS & DATA ANALYSIS**

(*Bold & Italic* indicates Primary Key, *Italic* indicates Foreign Key)

- **Table Name: tbl\_program**  
Attributes: ***p\_id char (15)***, p\_title varchar2 (60), p\_abv char (10)  
Sample Data: IST, Information Science and Telecommunications, INFSCI
- **Table Name: tbl\_program\_area**  
Attributes: ***p\_id char (15)***, ***p\_area varchar2 (100)***  
Sample Data: IST, Cognitive Science Area
- **Table Name: tbl\_course**  
Attributes: ***c\_no char (20)***, c\_title varchar2 (60), c\_credit int, c\_des varchar2 (1000), c\_note varchar2 (200)  
Sample Data: INFSCI 2470, Interactive System Design, 3, The environments that can or should be....., C
- **Table Name: tbl\_course\_area**  
Attributes: ***c\_no char (20)***, ***c\_area varchar2 (100)***  
Sample Data: INFSCI 2470, Cognitive Systems Area
- **Table Name: tbl\_interest**  
Attributes: ***interest varchar2 (50)***  
Sample Data: Data Warehouse Specialist
- **Table Name: tbl\_faculty**  
Attributes: ***f\_id char (20)***, f\_fname char (20), f\_lname char (20), f\_title varchar2 (40), f\_pwd char (20), f\_email varchar2 (40), f\_web varchar2 (100), ***f\_dept char (15)***  
Sample Data: vz, Vladimir, Zadorozhny, Associate Professor, vz, [vladimir@mail.sis.pitt.edu](mailto:vladimir@mail.sis.pitt.edu), <http://www.sis.pitt.edu/~vladimir>, IST
- **Table Name: tbl\_term**  
Attributes: ***t\_id char (10)***, t\_section char (15), t\_year int, t\_start date, t\_end date  
Sample Data: 04-1, fall, 2003, 25-AUG-03, 13-DEC-03
- **Table Name: tbl\_user**  
Attributes: ***u\_id char (20)***, u\_fname char (20), u\_lname char (20), u\_pwd char (20), u\_email varchar2 (40), ***advisor char (20)***, ***u\_program char (15)***, u\_degree char (10), ***start\_term char (10)***, ***end\_term char (10)***  
Sample Data: LMao, Li-Chen, Mao, Lmao, [maolichen@hotmail.com](mailto:maolichen@hotmail.com), peterb, IST, master, 03-1, 04-2

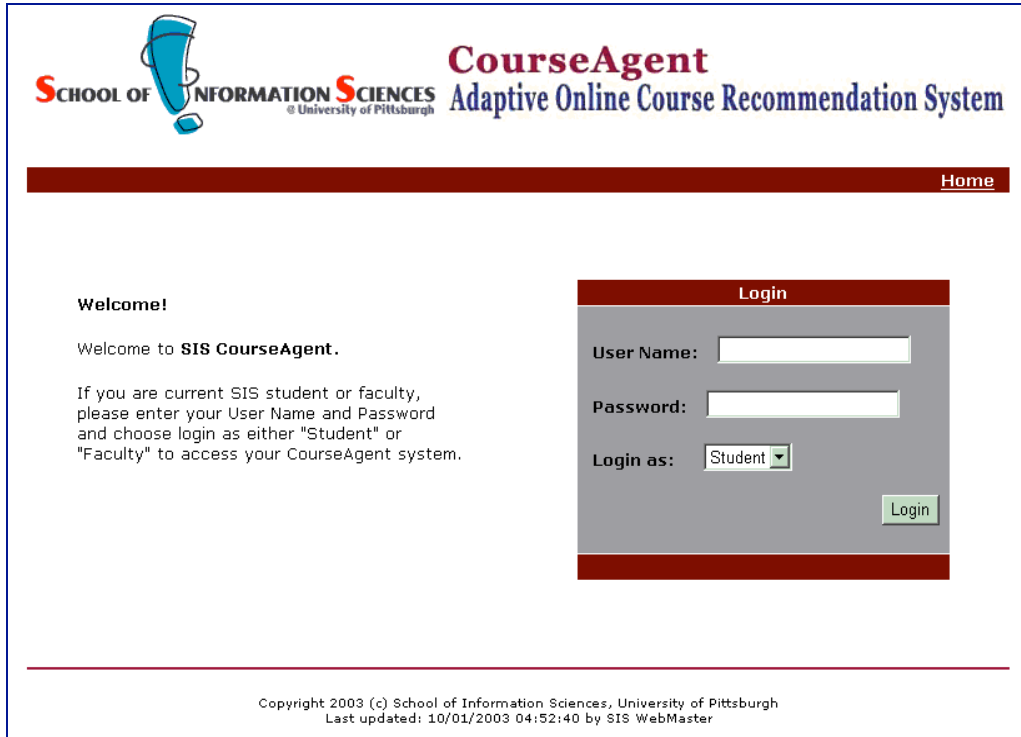
- **Table Name: tbl\_user\_interest**  
Attributes: *u\_id char (20), u\_interest varchar2 (50)*  
Sample Data: LMao, System Analyst
- **Table Name: tbl\_schedule**  
Attributes: *crn int, c\_no char (20), day char (15), time char (20), location char (20), instructor char (20), courseweb varchar2 (100), t\_id char (10), p\_id char (15), duration char (15), date\_modified date, note char (30)*  
Sample Data: 43274, INFSCI 2160, mon, 6:00 – 8:50pm, IS 403, hirtle, 04-1, IST, semester
- **Table Name: tbl\_course\_taken**  
Attributes: *u\_id char (20), c\_no char (20), crn int, grade char (5)*  
Sample Data: LMao, INFSCI 2000, 2894
- **Table Name: tbl\_course\_eval**  
Attributes: *u\_id char (20), c\_no char (20), crn int, overall int, workload int, comment varchar2 (2000)*  
Sample Data: LMao, INFSCI 2000, 2894, 3, 2, good introduction course
- **Table Name: tbl\_goal\_eval**  
Attributes: *u\_id char (20), c\_no char (20), crn int, interest varchar2 (50), meet\_goal int*  
Sample Data: LMao, INFSCI 2710, 14743, System Analyst, 2
- **Table Name: tbl\_course\_result**  
Attributes: *c\_no char (20), oa\_rate int, wl\_rate int*  
Sample Data: INFSCI 2470, 2, 3
- **Table Name: tbl\_goal\_result**  
Attributes: *c\_no char (20), interest varchar2 (50), meet\_rate int*  
Sample Data: INFSCI 2470, GUI Programmer, 3
- **Table Name: tbl\_advise**  
Attributes: *u\_id char (20), f\_id char (20), c\_no char (20)*  
Sample Data: qqmo, peterb, INFSCI 2510
- **Table Name: tbl\_user\_plan**  
Attributes: *u\_id char (20), t\_id char (10), c\_no char (20), c\_area varchar2 (100)*  
Sample Data: qqmo, INFSCI 2120, Mathematical and Formal Foundations Area

## INTERFACE DESIGN



The screenshot shows the home page of the CourseAgent system. At the top left is the logo for the School of Information Sciences, University of Pittsburgh, featuring a stylized blue exclamation mark. To the right of the logo, the text reads "SCHOOL OF INFORMATION SCIENCES © University of Pittsburgh" and "CourseAgent Adaptive Online Course Recommendation System". Below the logo and text is a red navigation bar with the text "Login | Administrator". On the right side of the page, there is a photograph of a modern building. The main content area contains a "Welcome!" heading followed by a paragraph: "Welcome to the SIS CourseAgent, the implementation at the School of Information Sciences of the Adaptive Online Course Recommendation System. SIS CourseAgent is special designed for students and faculties in the School of Information Sciences and is also available to the public who has interests in the courses offered at the School of Information Sciences." Below this is another paragraph: "You could either visit our course catalog to get general information about courses offered in SIS or Login to our CourseAgent system to get more personalized information." At the bottom of the page, there is a copyright notice: "Copyright 2003 (c) School of Information Sciences, University of Pittsburgh Last updated: 03/29/2004 11:41:50 by SIS WebMaster".

Figure 1. System Home



The screenshot shows the login page of the CourseAgent system. At the top left is the logo for the School of Information Sciences, University of Pittsburgh, featuring a stylized blue exclamation mark. To the right of the logo, the text reads "SCHOOL OF INFORMATION SCIENCES © University of Pittsburgh" and "CourseAgent Adaptive Online Course Recommendation System". Below the logo and text is a red navigation bar with the text "Home". The main content area contains a "Welcome!" heading followed by a paragraph: "Welcome to SIS CourseAgent. If you are current SIS student or faculty, please enter your User Name and Password and choose login as either 'Student' or 'Faculty' to access your CourseAgent system." To the right of the text is a login form with a red header "Login". The form contains three input fields: "User Name:" with a text input field, "Password:" with a text input field, and "Login as:" with a dropdown menu showing "Student". Below the input fields is a "Login" button. At the bottom of the page, there is a copyright notice: "Copyright 2003 (c) School of Information Sciences, University of Pittsburgh Last updated: 10/01/2003 04:52:40 by SIS WebMaster".

Figure 2. Login

**SCHOOL OF INFORMATION SCIENCES** **CourseAgent**  
© University of Pittsburgh **Adaptive Online Course Recommendation System**

My CourseAgent | Schedules | Career Scope | Study Plan | Course Catalog | Faculties

Profile | Career Intrests | Courses Taken | Advisor | QQ 's CourseAgent | Log off

Hi, QQ !

Welcome to the **SIS CourseAgent**, the implementation at the School of Information Sciences of the **Adaptive Online Course Recommendation System**.  
 SIS CourseAgent is special designed for students and faculties in the School of Information Sciences and is also available to the public who has interests in the courses offered at the School of Information Sciences.

**The SIS CourseAgent is a good tool to give you recommendation on courses that might interests you or has the most benefit to you.**  
 Based on advisor's recommendation and students' evaluations about each course, you could have a snap shot about what courses are good to you according to your personal career goals and your progress of taking courses relevant to your personal career goals.

**This Adaptive Online Course Recommendation System is still under developing and testing stage.**  
 With your participating in testing this system, your opinion is highly important to make this system more reliable, more practical to meet your needs. Please do not hesitat to share your opinions with us. We would appreciate it if you e-mail your thoughts to lim9@pitt.edu.Thanks! **Let's make this system better.**

Copyright 2003 (c) School of Information Sciences, University of Pittsburgh  
 Last updated: 04/27/2004 01:42:21 by CourseAgent WebMaster

Figure 3. Course Agent

My CourseAgent | Schedules | Career Scope | Study Plan | Course Catalog | Faculties

Profile | Career Intrests | Courses Taken | Advisor | QQ 's CourseAgent | Log off

**Course V.S. Career Interests**

Please evaluate the following course based on your personal experience with the material prepared by the instructor.

CRN: 15169  
 Course No: INFSCI 2000  
 Instructor: pmunro  
 Term: 04-1

- How would you say about the worklaod of this course: Average

How relevant is this course to each of your career goals:

Position Title	Rate it
Database Administrator :	Not Relevant
Database Analyst :	Not Relevant
Graphical User Interface (GUI) Programmer :	Relevant
Web Application Developer :	Relevant
Web Designer :	Relevant

Comment:

Submit

Figure 4. Course Evaluation

<a href="#">My CourseAgent</a>	<a href="#">Schedules</a>	<a href="#">Career Scope</a>	<a href="#">Study Plan</a>	<a href="#">Course Catalog</a>	<a href="#">Faculties</a>	QQ 's CourseAgent <a href="#">Log off</a>																																																																																																																									
<div style="display: flex; justify-content: center; align-items: center; gap: 10px;"> <span>2002 fall</span> <span>List</span> </div> <p><b>Schedule of fall 2004</b></p> <p>* Gray: Course Taken : Recommend by Advisor : Degree of Relevance to Career Goals</p> <table border="1"> <thead> <tr> <th></th> <th>CRN</th> <th>Course No</th> <th>Day</th> <th>Time</th> <th>Location</th> <th>Instructor</th> <th>Evaluation</th> </tr> </thead> <tbody> <tr> <td></td> <td>14014</td> <td>INFSCI 2000</td> <td>wed</td> <td>6:00-8:50pm</td> <td>169 Crawf</td> <td>Michael Spring</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>33362</td> <td>INFSCI 2100</td> <td>tue</td> <td>12:00-2:50pm</td> <td>IS 411</td> <td>Marek Druzdzal</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>21665</td> <td>INFSCI 2140</td> <td>tue</td> <td>6:00-8:50pm</td> <td>IS 404</td> <td>Peter Brusilovsky</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>33356</td> <td>INFSCI 2160</td> <td>mon</td> <td>6:00-8:50P</td> <td>IS 404</td> <td>Stephen Hirtle</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>14647</td> <td>INFSCI 2300</td> <td>tue</td> <td>6:00-8:50P</td> <td>A214 Langy</td> <td>Douglas Metzler</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>42557</td> <td>INFSCI 2410</td> <td>mon</td> <td>6:00-8:50P</td> <td>IS 405</td> <td>TBA</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>25863</td> <td>INFSCI 2470</td> <td>tue</td> <td>6:00-8:50P</td> <td>IS 411</td> <td>Michael Lewis</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>1849</td> <td>INFSCI 2510</td> <td>wed</td> <td>3:00-5:50P</td> <td>IS 403</td> <td>Ken Sochats</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>42561</td> <td>INFSCI 2540</td> <td>thu</td> <td>3:00-5:50P</td> <td>IS 404</td> <td>Hassan Karimi</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>42566</td> <td>INFSCI 2550</td> <td>tue</td> <td>3:00-5:50P</td> <td></td> <td>Peter Brusilovsky</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>25184</td> <td>INFSCI 2610</td> <td>thu</td> <td>3:00-5:50P</td> <td>IS 403</td> <td>Roger Flynn</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>2710</td> <td>INFSCI 2710</td> <td>tue</td> <td>3:00-5:50P</td> <td>IS 405</td> <td>Vladimir Zadorozhny</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>42574</td> <td>INFSCI 2906</td> <td>mon</td> <td>3:00-5:50P</td> <td>IS 501</td> <td>Douglas Metzler</td> <td><a href="#">Review</a></td> </tr> <tr> <td></td> <td>1876</td> <td>INFSCI 2940</td> <td>appointment</td> <td>By appointment</td> <td></td> <td>Martin Weiss</td> <td><a href="#">Review</a></td> </tr> </tbody> </table>									CRN	Course No	Day	Time	Location	Instructor	Evaluation		14014	INFSCI 2000	wed	6:00-8:50pm	169 Crawf	Michael Spring	<a href="#">Review</a>		33362	INFSCI 2100	tue	12:00-2:50pm	IS 411	Marek Druzdzal	<a href="#">Review</a>		21665	INFSCI 2140	tue	6:00-8:50pm	IS 404	Peter Brusilovsky	<a href="#">Review</a>		33356	INFSCI 2160	mon	6:00-8:50P	IS 404	Stephen Hirtle	<a href="#">Review</a>		14647	INFSCI 2300	tue	6:00-8:50P	A214 Langy	Douglas Metzler	<a href="#">Review</a>		42557	INFSCI 2410	mon	6:00-8:50P	IS 405	TBA	<a href="#">Review</a>		25863	INFSCI 2470	tue	6:00-8:50P	IS 411	Michael Lewis	<a href="#">Review</a>		1849	INFSCI 2510	wed	3:00-5:50P	IS 403	Ken Sochats	<a href="#">Review</a>		42561	INFSCI 2540	thu	3:00-5:50P	IS 404	Hassan Karimi	<a href="#">Review</a>		42566	INFSCI 2550	tue	3:00-5:50P		Peter Brusilovsky	<a href="#">Review</a>		25184	INFSCI 2610	thu	3:00-5:50P	IS 403	Roger Flynn	<a href="#">Review</a>		2710	INFSCI 2710	tue	3:00-5:50P	IS 405	Vladimir Zadorozhny	<a href="#">Review</a>		42574	INFSCI 2906	mon	3:00-5:50P	IS 501	Douglas Metzler	<a href="#">Review</a>		1876	INFSCI 2940	appointment	By appointment		Martin Weiss	<a href="#">Review</a>
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Figure 5. Adaptive Schedule View



**SCHOOL OF INFORMATION SCIENCES**  
University of Pittsburgh

## CourseAgent

### Adaptive Online Course Recommendation System

[My CourseAgent](#) | [Schedules](#) | [Career Scope](#) | [Study Plan](#) | [Course Catalog](#) | [Faculties](#) | QQ 's CourseAgent [Log off](#) | |

#### Review Course Evaluation

**Course No:** INFSCI 2710  
**Title:** DATABASE MANAGEMENT  
**Instructor:** Vladimir Zadorozhny

**Evaluation**  
 Workload:

**Relevance to qqmo's career goals**

Database Administrator:

Database Analyst:

Graphical User Interface (GUI) Programmer:

Web Application Developer:

Web Designer:

[Back to Schedule List](#)

Figure 6. Adaptive Class Rating

My CourseAgent | Schedules | Career Scope | Study Plan | Course Catalog | Faculties

QQ 's CourseAgent [Log off](#)

### Career vs. Courses Taken

No. of Courses Taken: 10 No. of Courses Evaluated: 8

<b>Database Administrator</b>	<a href="#">View Recommended Courses -----</a> <input type="button" value="Plan"/>
INFSCI 2711 DATABASE ANALYSIS AND DESIGN My rating: ★★☆☆	
<b>Database Analyst</b>	<a href="#">View Recommended Courses -----</a> <input type="button" value="Plan"/>
INFSCI 2711 DATABASE ANALYSIS AND DESIGN My rating: ★★☆☆	
<b>Graphical User Interface (GUI) Programmer</b>	<a href="#">View Recommended Courses -----</a> <input type="button" value="Plan"/>
INFSCI 2300 HUMAN INFORMATION PROCESSING My rating: ★★☆☆	
INFSCI 2470 INTERACTIVE SYSTEM DESIGN My rating: ★★☆☆	
INFSCI 2550 CLIENT-SERVER AND WORKSTATION SYSTEMS My rating: ★★☆☆	
<b>Web Application Developer</b>	<a href="#">View Recommended Courses -----</a> <input type="button" value="Plan"/>
INFSCI 2550 CLIENT-SERVER AND WORKSTATION SYSTEMS My rating: ★★☆☆	
INFSCI 2710 DATABASE MANAGEMENT My rating: ★★☆☆	
<b>Web Designer</b>	<a href="#">View Recommended Courses -----</a> <input type="button" value="Plan"/>

Figure 7. Adaptive Career vs. Courses Taken View

My CourseAgent | Schedules | Career Scope | Study Plan | Course Catalog | Faculties

Profile | Career Intrests | Courses Taken | Advisor QQ 's CourseAgent [Log off](#)

### List of Course Taken

Course No	CRN	Grade	Evaluation
INFSCI 2000	15169	N/A	<a href="#">Evaluate</a>
INFSCI 2100	43279	N/A	<a href="#">Evaluate</a>
INFSCI 2300	15879	N/A	<a href="#">Evaluate</a>
INFSCI 2470	20176	N/A	<a href="#">Evaluate</a>
INFSCI 2550	13783	N/A	<a href="#">Evaluate</a>
INFSCI 2710	14833	N/A	<a href="#">Evaluate</a>
INFSCI 2711	42623	N/A	<a href="#">Evaluate</a>
INFSCI 2720	21998	N/A	<a href="#">Evaluate</a>
INFSCI 2770	21993	N/A	<a href="#">Evaluate</a>
TELCOM 2000	15572	N/A	<a href="#">Evaluate</a>

\*\*\* Please make sure the course you selected is offered in the selected term \*\*\*

Select a term.....   
 Select a course taken.....

Figure 8. Adding Course Taken & Evaluation View

**SCHOOL OF INFORMATION SCIENCES** **CourseAgent**  
 © University of Pittsburgh **Adaptive Online Course Recommendation System**

My AdviseAgent | Schedules | Course Catalog | Faculties

Profile | Teaching History | Advising Student | Prof. Zadorozhny 's AdviseAgent | Log off

**Hi, Prof. Zadorozhny !**

Welcome to the **SIS CourseAgent**, the implementation at the School of Information Sciences of the **Adaptive Online Course Recommendation System**.

SIS CourseAgent is special designed for students and faculties in the School of Information Sciences and is also available to the public who has interests in the courses offered at the School of Information Sciences.

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**This Adaptive Online Course Recommendation System is still under developing and testing stage.** With your participating in testing this system, your opinion is highly important to make this system more reliable, more practical to meet your needs. Please do not hesitate to share your opinions with us. We would appreciate it if you e-mail your thoughts to lim9@pitt.edu.Thanks! **Let's make this system better.**

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 Last updated: 04/27/2004 01:48:56 by CourseAgent WebMaster

Figure 9. Advise Agent

My AdviseAgent | Schedules | Course Catalog | Faculties

Profile | Teaching History | Advising Student | Prof. Brusilovsky 's AdviseAgent | Log off

**List of Advising Students**

First Name	Last Name	E-mail	Degree	Start	End	Details	Advise
Li-Chen	Mao	maolichen@hotmail.com	master	03-2	04-1	<a href="#">View</a>	<a href="#">View</a>
QQ	Mo	qqmo@hellokitty.com	master	04-1	05-2	<a href="#">View</a>	<a href="#">View</a>
Vincent	Hsiu	vincent@hotmail.com	master	03-1	04-1	<a href="#">View</a>	<a href="#">View</a>
Ivy	Gentile	igentile@bc.pitt.edu	master	03-1	05-1	<a href="#">View</a>	<a href="#">View</a>
Polina	Hristozova	antonh@earthlink.net	master	03-1	05-2	<a href="#">View</a>	<a href="#">View</a>
Adamo	Mosca	mosca125@hotmail.com	master	03-2	04-3	<a href="#">View</a>	<a href="#">View</a>
Ying-Ying	Shih	ysisst1@pitt.edu	phd	03-1	05-2	<a href="#">View</a>	<a href="#">View</a>
Guoliang	Xiang	xianggl@yahoo.com	master	03-1	03-1	<a href="#">View</a>	<a href="#">View</a>
Yuko	Asano	yua2@pitt.edu	master	04-1	05-1	<a href="#">View</a>	<a href="#">View</a>
Melanie	Bazzano	melbazzano@yahoo.com	master	04-1	03-1	<a href="#">View</a>	<a href="#">View</a>
Susan	Fineman	susan.fineman@verizon.net	master	04-2	05-3	<a href="#">View</a>	<a href="#">View</a>
Eric	Garcia	ericg@sis-tek.com	master	04-1	03-1	<a href="#">View</a>	<a href="#">View</a>
Ivy	Gentile	igentile@bc.pitt.edu	master	03-1	03-1	<a href="#">View</a>	<a href="#">View</a>
Sheela	Ghosal	ghosal@nsabp.pitt.edu	master	03-3	03-1	<a href="#">View</a>	<a href="#">View</a>
Eriko	Iwata	eri3@pitt.edu	master	04-1	03-1	<a href="#">View</a>	<a href="#">View</a>
Laurie	King	lking@kiski.net	master	04-1	03-1	<a href="#">View</a>	<a href="#">View</a>
Li-Chen	Mao	maolichen@hotmail.com	master	03-2	03-1	<a href="#">View</a>	<a href="#">View</a>

Figure 10. Advising Students

## **FUTURE IMPROVEMENTS**

For over a year, I kept working on this *Adaptive Online Course Recommendation System - CourseAgent* for two of my independent study practices. Although the pace of the development is not as efficient as expected, and the system is still far away from complete, some basic features of *CourseAgent* have been developed gradually.

To develop the system, I put together everything I learned, and gained more experience and knowledge through self-study and discussions with Dr. Brusilovsky. This project has lightened up my interests in adaptive systems, and I would like to put more efforts in researches about it. Maybe it is the end of my independent studies, but the development of *CourseAgent* will keep going no matter where I am. I hope some day this system could be applied through out the school or even the university.

Up to now, I would say about 60% of features are there in the system already. Some of them still need to be modified or changed and the rest 40% of features are geared to be implemented. Here are some future-improvements are suggested:

- *Apply the interface design to AdminAgent and improve system features*
- *Improve adaptive functionalities to AdviseAgent*
- *Apply more adaptive functionalities in depth and different phases*
- *Better presentation for adaptive features, such as meaningful and clear indications for courses taken, courses suggested by advisor, courses related to career goals and so on*
- *Enhanced error-handling features through out the system, such as the system would be able to prompt appropriate messages according to errors occur*
- *Necessary modification to database structure to meet system functionalities*
- *Remove spelling errors and incorrect information*

## **SAMPLE SOURCE CODES**

## **SAMPLE CODE 1 – COURSEAGENT.CGI**

```
#!/opt/bin/perl
use DBI;
use functions;
use CGI qw( :standard );
use CGI::Cookie;

#-----Parsing Passed Parameter-----#
$name = param("name");
$as = param("as");

#-----Oracle Database Connection Setting-----#
$ENV{ORACLE_HOME} = "/opt/local/sources/packages/oracle/product/8.1.7";
$ENV{TWO_TASK} = "sis";
$ENV{LD_LIBRARY_PATH} = "/opt/local/sources/packages/oracle/product/8.1.7/lib";

$user = "cagent";
$password = "Orange34";

$dbh = DBI->connect("DBI:Oracle:sis", $user, $password)
    || die "Couldn't connect to database: " . DBI->errstr;

#-----Checking Login Cookie -----#
my %cookies = CGI::Cookie->fetch;
if(%cookies){
    my $user = $cookies{signin}->value;
    my $usertype = $cookies{signas}->value;
}else{
    print "Location: http://www.sis.pitt.edu/~cagent/login.html \n\n";
}

#-----Variables & Statements Initialization-----#
$at = '@';
$email = 'lim9'.$at.'pitt.edu';
```

```

#-----Start HTML Output-----#

print (qq
{
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
  <title>SIS CourseAgent - Adaptive Online Course Recommendation System</title>
  <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
</head>

<body link="#FFFFFF" vlink="#FFFFFF" alink="#CCCCCC">
  <p align="center"> 
});

#-----If-Else Statement - Status as Student - Menu Setting-----#

if($as eq 'student'){
  $statement = "select u_fname from tbl_user where u_id = \"\$name\"";
  $sth = $dbh->prepare($statement);
  $sth->execute;
  while(@res = $sth->fetchrow){
    foreach(@res){
      $fname = $_;
    }
  }
  $greeting = 'Hi, '.$fname.'!';
  $color = '#990000';

print (qq
{
<fieldset style="padding: 2; border-color: #9E0B0E; font: 2pt">
  <legend>
    <a href="../cgi-bin/courseagent.cgi?name=$name&as=$as"></a>
    <a href="../cgi-bin/schedule.cgi?name=$name&as=$as"></a>

```





```

        <strong><a href="logout.cgi?name=$name&as=$as">Log off</a>&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;</strong>
    </td>
</tr>
</table><p>
});
}

#-----Printing Main Window Output-----#

print (qq
{
<table width="95%" border="0" align="center" cellpadding="0" cellspacing="0">
<tr>
<td width="80%">
<blockquote>
<p align="left"><strong><font size="2" face="Verdana">$greeting</font></strong></p>

<p><font size="2" face="Verdana">
Welcome to the <strong>SIS CourseAgent</strong>,
the implementation at the School of Information Sciences of the<strong>
Adaptive Online Course Recommendation System</strong>. <br>
SIS CourseAgent is special designed for students and faculties in the School of Information
Sciences and is also avaialble to the public who has interests in the courses offered at the School of
Information Sciences.
</font></p>

<p><font size="2" face="Verdana"><strong>
The SIS CourseAgent is a good tool to give you recommendation on courses
that might interests you or has the most benefit to you. </strong><br>
Based on advisor's recommendation and students' evaluations about each course,
you could have a snap shot about what courses are good to you according to your personal career
goals
and your progress of taking courses relevant to your personal career goals.
</font></p>

<p><font size="2" face="Verdana" linkcolor = "#555555"><strong>

```

This Adaptive Online Course Recommendation System is still under developing and testing stage.</strong><br>

With your participating in testing this system, your opinion is highly important to make this system more reliable,

more practical to meet your needs. Please do not hesitate to share your opinions with us.

We would appreciate it if you e-mail your thoughts to

\$email.Thanks! <b>Let's make this system better.</b>

</font></p>

</blockquote>

</td>

<td width="20%"><p>&nbsp;</p>

</td>

</tr>

<tr>

<td height="2" colspan="2" bgcolor = \$color>

</td>

</tr>

</table>

<!----- Copyright & Modification Time Stamp ----->

<p align="center"><font size="1" face="Verdana">

Copyright 2003 (c) School of Information Sciences, University of Pittsburgh<br>

<script language="javascript" type="text/JavaScript">document.write("Last updated: " + document.lastModified); </script>

by CourseAgent WebMaster</font></p>

</body>

</html>

});

## **SAMPLE CODE 2 – S-LIST.CGI**

```
#!/opt/bin/perl
use DBI;
use functions;
use CGI qw( :standard );

#-----Parsing Passed Parameter-----#
my $term = param("term");
my $name = param("name");
my $as = param("as");
my $section;
my $year;

#-----Oracle Database Connection Setting-----#
$ENV{ORACLE_HOME} = "/opt/local/sources/packages/oracle/product/8.1.7";
$ENV{TWO_TASK} = "sis";
$ENV{LD_LIBRARY_PATH} = "/opt/local/sources/packages/oracle/product/8.1.7/lib";

$user = "cagent";
$password = "Orange34";

$dbh = DBI->connect("DBI:Oracle:sis", $user, $password)
    || die "Couldn't connect to database: " . DBI->errstr;

#-----Variables & Statements Initialization-----#
$statement4 = "select t_section, t_year from tbl_term where t_id = \"\$term\"";
$sth = $dbh->prepare($statement4);
$sth->execute;
while (@res = $sth->fetchrow){
    $count = 0;
    foreach(@res){
        if ($count == 0){
            $section = $_;
        }elseif($count == 1){
            $year = $_;
        }
    }
}
```

```

    }
    $count++;
}
$statement7 = "select S.crn, S.c_no, S.day, S.time, S.location, F.f_fname, F.f_lname
              from tbl_schedule S, tbl_faculty F where S.t_id = \"\$term\" and S.instructor = F.f_id";
}

#-----Start HTML Output-----#
print (qq
{
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
  <title>SIS CourseAgent - Adaptive Online Course Recommendation System</title>
  <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
</head>

<body link="#FFFFFF" vlink="#FFFFFF" alink="#CCCCCC">
  <p align="center"> 
});

#-----If-Else Statement - Status as Student - Menu Setting-----#
if($as eq 'student'){
  $statement = "select u_fname from tbl_user where u_id = \"\$name\"";
  $sth = $dbh->prepare($statement);
  $sth->execute;
  while(@res = $sth->fetchrow){
    foreach(@res){
      $fname = $_;
    }
  }
  $color = '#990000';
print (qq
{
<fieldset style="padding: 2; border-color: #9E0B0E; font: 2pt">
<legend>

```





```

#-----Printing Main Window Output-----#

print (qq
{
<table width="97%" border="0" align="center" cellpadding="0" cellspacing="0">
  <tr>
    <td width="100%" align="center">
      <form name="Form" method="post" action=" ../cgi-bin/s-list.cgi?name=$name&as=$as">
        <select name="term">
}});

$statement5 = "select distinct S.t_id, T.t_section, T.t_year
              from tbl_schedule S, tbl_term T
              where S.t_id = T.t_id";
$sth = $dbh->prepare($statement5);
$sth->execute;

while(@res = $sth->fetchrow){
  $count = 0;
  foreach(@res){
    if($count == 0){
      $tid = $_;
    }elseif($count == 1){
      $tsection = $_;
    }elseif($count == 2){
      $tyear = $_;
    }
    $count++;
  }
  print "<option value = \"\$tid\">$tyear $tsection</option>";
}

print (qq
{
  </select>&nbsp;
  <input type="submit" name="Submit" value="List" >
}

```

```

        <input type="hidden" name="name" value=$name>
        <input type="hidden" name="as" value=$as>
    </form>
</td>
</tr>
<tr>
<td width="100%"> <blockquote>
});

$statement1 = "select c_no from tbl_advise where u_id = '$name'";
$sth = $dbh->prepare($statement1);
$sth->execute;
$i=0;
while(@res = $sth->fetchrow){
    foreach(@res){
        @advise[$i] = $_;
    }
    $i++;
}

$statement2 = "select c_no from tbl_course_taken where u_id = '$name'";
$sth = $dbh->prepare($statement2);
$sth->execute;
$j=0;
while(@res = $sth->fetchrow){
    foreach(@res){
        @taken[$j] = $_;
    }
    $j++;
}

$statement6 = "select u_interest from tbl_user_interest where u_id = \'$name\'";
$sth6 = $dbh->prepare($statement6);
$sth6->execute;
$z=0;

```

```

while(@res = $sth6->fetchrow){
    foreach(@res){
        $statement3 = "select distinct c_no from tbl_goal_result where interest = '$_' and meet_rate >=
3";
        $sth3 = $dbh->prepare($statement3);
        $sth3->execute;
        while(@res = $sth3->fetchrow){
            foreach(@res){
                @career_rate[$z] = $_;
            }
            $z++;
        }
    }
}

$sth = $dbh->prepare($statement7);
$sth->execute;

print "<center><b>Schedule of $section $year</b></center>";
print "<p>";
print "* <font color =\"#AAAAAA\">Gray</font>: Course Taken
    <img src=\"../image/lightbulb.gif\" alt = \"Recommend by Advisor\">: Recommend by Advisor
    <img src=\"../image/thumbs_up.gif\" alt = \"Relevant to Your Career Goal\">: Degree of Relevance to
Career Goals";
print "<TABLE border= 1 width = 95%>" ;
print "<TR><TD></TD><TD><b>CRN</b></TD><TD><b>Course No</b></TD>
    </TD><TD><b>Day</b></TD><TD><b>Time</b></TD><TD><b>Location</b></TD>
    <TD><b>Instructor</b></TD><TD bgcolor=\"#999999\"><b>Evaluation</b></TD></TR>";

while(@res = $sth->fetchrow){
    print "<TR>";
    $count =0;
    foreach(@res){
        if ($count == 0){
            $crn = $_;
        }elseif ($count == 1){
            #print "<TD>$_</TD>";

```

```

        $cno = $_;
    }elseif ($count == 2){
        $day = $_;
        #print "<TD>$_</TD>";
    }elseif ($count == 3){
        $time = $_;
    }elseif ($count == 4){
        $loc = $_;
    }elseif ($count == 5){
        $f_fname = $_;
    }elseif ($count == 6){
        $f_lname = $_;
    }
    $count++;
}
$show_taken = 0;
for($flag=0; $flag <= $j; $flag++){
    if ($cno eq $taken[$flag]){
        print "<TD>";
        for($flag1=0; $flag1 <= $i; $flag1++){
            if ($cno eq $advise[$flag1]){
                print "<img src='../image/lightbulb.gif' alt = \"Recommend by Advisor\">";
                break;
            }
        }

        for($flag2=0; $flag2 <= $z; $flag2++){
            if ($cno eq $career_rate[$flag2]){
                print "<img src='../image/thumbs_up.gif' alt = \"Degree of Relevance to Your
Career Goals\">";
                break;
            }
        }
        print "</TD>";
        print "<TD><font color =\"#AAAAAA\">$crn</font></TD>";
        print "<TD><font color =\"#AAAAAA\">$cno</font></TD>";
    }
}

```

```

print "<TD><font color =\"#AAAAAA\">$day</font></TD>";
print "<TD><font color =\"#AAAAAA\">$time</font></TD>";
print "<TD><font color =\"#AAAAAA\">$loc</font></TD>";
print "<TD><font color =\"#AAAAAA\">$f_fname $f_lname</font></TD>";
print "<TD bgcolor=\"#999999\">
    <a href=\"../cgi-bin/c-eval-
review.cgi?name=$name&as=$as&term=$term&cno=$cno&crn=$crn\">
        Review</a></TD>";
    $show_taken = 1;
    break;
}
}

if ($show_taken == 0){
    print "<TD>";
    for($flag1=0; $flag1 <= $i; $flag1++){
        if ($cno eq $advise[$flag1]){
            print "<img src=\"../image/lightbulb.gif\" alt = \"Recommend by Advisor\">";
            break;
        }
    }

    for($flag2=0; $flag2 <= $z; $flag2++){
        if ($cno eq $career_rate[$flag2]){
            print "<img src=\"../image/thumbs_up.gif\" alt = \"Degree of Relevance to Your
Career Goals\">";
            break;
        }
    }
    print "</TD>";
    print "<TD>$crn</TD>";
    print "<TD>$cno</TD>";
    print "<TD>$day</TD>";
    print "<TD>$time</TD>";
    print "<TD>$loc</TD>";
    print "<TD>$f_fname $f_lname</TD>";

```

```

        print "<TD bgcolor=\`#999999\`">
            <a href=\`c-eval-review.cgi?name=$name&as=$as&term=$term&cno=$cno&crm=$crm\`">
                Review</a></TD>";
    }
print "\n";
print "</TR>";
}
print "</TABLE>";
print "<p>";

print (qq
{
</td></tr>
<tr>
    <td><center>
    <br>
    <form name="Form" method="post" action=" ../cgi-bin/s-list.cgi?name=$name&as=$as">
    <p><select name="term">
});

$sth = $dbh->prepare($statement5);
$sth->execute;
while(@res = $sth->fetchrow){
    $count = 0;
    foreach(@res){
        if($count == 0){
            $tid = $_;
        }elseif($count == 1){
            $tsection = $_;
        }elseif($count == 2){
            $tyear = $_;
        }
        $count++;
    }
    print "<option value = \`$tid\`">$tyear $tsection</option>";
}
}

```

```

print (qq
{
    </select>&nbsp;
    <input type="submit" name="Submit" value="List" >
    <input type="hidden" name="name" value=$name>
    <input type="hidden" name="as" value=$as>
    </p>
    </form></center></td>
    <p>&nbsp;</p>
    <p>&nbsp;</p>
    </blockquote><div align="right"></div></td>

</tr>
<tr>
    <td height="2" colspan="2" bgcolor = $color>
    </td>
</tr>
</table>

<!------- Copyright & Modification Time Stamp ----->

<p align="center"><font size="1" face="Verdana">
    Copyright 2003 (c) School of Information Sciences, University of Pittsburgh<br>
    <script language="javascript" type="text/JavaScript">document.write("Last updated: " +
document.lastModified); </script>
    by CourseAgent WebMaster</font></p>
</body>
</html>
});

```