

# MISTI-China iCampus Internship Report

## Dalian University of Technology

Summer 2005



Partial view of DLUT's dormitories from a mountain top

*2005 Dalian iCampus Team Members:*

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*DLUT Faculty and Staff:*

Hong Zhu, Teaching Affairs Division

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**Part I.**

*Were you aware of the OCW/iCampus site prior to your involvement with the MISTI program? Did you use the sites prior to your involvement with the MISTI program?*

Because the iLabs project has been used by the 6.012 Microelectronic Devices and Circuits class at MIT for a few semesters, I was aware of the iCampus movement prior to my involvement with the MISTI program. During the training before going to China, I set up a guest account at the MIT iLabs website and practiced using the microelectronics iLab.

*Did you notice OCW/iCampus materials that did not contain the most current subject information? What changes did you make to OCW-based materials to update the subject information? Was their sufficient depth of material in OCW/iCampus course sites from which you drew materials? Was the material of sufficient quality?*

For the Java class, we used the SP.772 OCW content from Spring 2005. We noticed that some of the lectures still taught Java 1.4, so we made and inserted a few lectures on Java 1.5 at the end. For the Microelectronics class, we used the 6.004 courseware from Spring 2005. Of course, in order to adapt to the DLUT environment, Harold and I modified the lectures based on the language background of our students. From a general perspective, however, I believe that the OCW materials were of great quality and greatly enhanced my teaching experience.

**Part II.**

*Were particular file types problematic? If so, why?*

The most convenient file type was PDF. Thus, it is essential in future years that MISTI equip the teams with Adobe Acrobat Professional, thereby allowing students using Windows to make PDF files. Luckily, Harold was able to make PDF's on his Apple

PowerBook. Moreover, a Lenovo-IBM ThinkPad would be a much better choice than the seven-pound Dell Inspiron issued by CECI.

*What cultural barriers to access and use of OCW/iCampus materials did you observe? To what extent was language a barrier to use for your students? To what extent were differing teaching practices a barrier to your effective use of OCW/iCampus-related materials?*

Many of the following observations apply to the Microelectronics class as well.

1. A lot of the bugs in the students' code were misspellings. Because everything in Java was in English -- ranging from keywords to variable names -- this was especially hard for them to debug. I was able to spot their spelling errors quickly, but those mistakes just didn't stand out for the students.
2. Students rarely asked questions during lecture, even if I asked for some feedback after teaching a concept. I can think of 3 possible reasons:
  - Students are not allowed to ask questions during lectures at DLUT
  - They didn't feel comfortable asking a question in English
  - They didn't feel comfortable letting their peers know what they didn't understand

The last point is also common in the U.S., but perhaps even more so at DLUT due to the culture's emphasis on "not losing face." Therefore, I had to resort to going around during lab time and helping them clear their confusions in quiet Chinese conversations.

3. From their point of view, learning a new computer language taught in a foreign language could be quite frustrating or even terrifying. Therefore, to alleviate the psychological stress, the lectures should be prepared so that even the student with the worst English wouldn't be afraid to attend class. I think we did fine, since our attendance soon reached a constant after the first few lectures. Occasionally a student would miss a class due to exams. A decreasing attendance rate would have been a nightmare.
4. Just like listening, reading can be daunting too. Imagine presenting 20 pages of small Chinese characters on a computer language also written in Chinese characters to an English speaker. That person would most likely not come to class again. Fortunately, the AITI lectures were very foreign-user-friendly with their large, bold, but short sentences.
5. Even though the students in Java class are potentially the best at DLUT (the CS dept has the highest average college entrance scores, and those chosen to attend our class were the best in the department), I still had to slow down my lecturing in English. Listening skills in a foreign language, unlike reading or vocabulary

memorization, strictly requires an environment, which they never had before. I think keeping the lecture as straightforward as possible is the best way to go. Any tangents or jokes in the middle of lecture might create a sense of disorientation and confuse some of them.

### **Part III.**

*Describe the various ways you were able to access the web during the course of your work. How much actual time on computers do you estimate your students had each week? For how much of that time were they connected to the internet?*

Even though DLUT has a strict firewall, we found the DLUT proxy that allowed us to access contents pertinent to our work, such as the secure <https://java.sun.com> website. After much experimenting, we found that all ports except 80 and 3128 were blocked. Therefore, in order for the iLabs service broker to work, the IT administrators opened up all ports for the server upon our request.

The students at DLUT seem to have 10BASE-T or 100BASE-T Ethernet drops in their dorms, and many students check into computer labs and the library between classes to use the Internet on campus. Thus, the local students have ample access to computers connected to the Internet.



Front entrance of the Central Teaching Building – location of our Java and Microelectronics classes



Side view of the Central Teaching Building

**Java – Modified SP.772 OCW from Spring 2005**



Students learning during Java lecture



Helping students debug in Java class

## Microelectronics – Modified 6.004 Courseware from Spring 2005



Students working together in Microelectronics class



Students building the CMOS diagrams on the board with 6.004 JSim

## Cultural Seminar

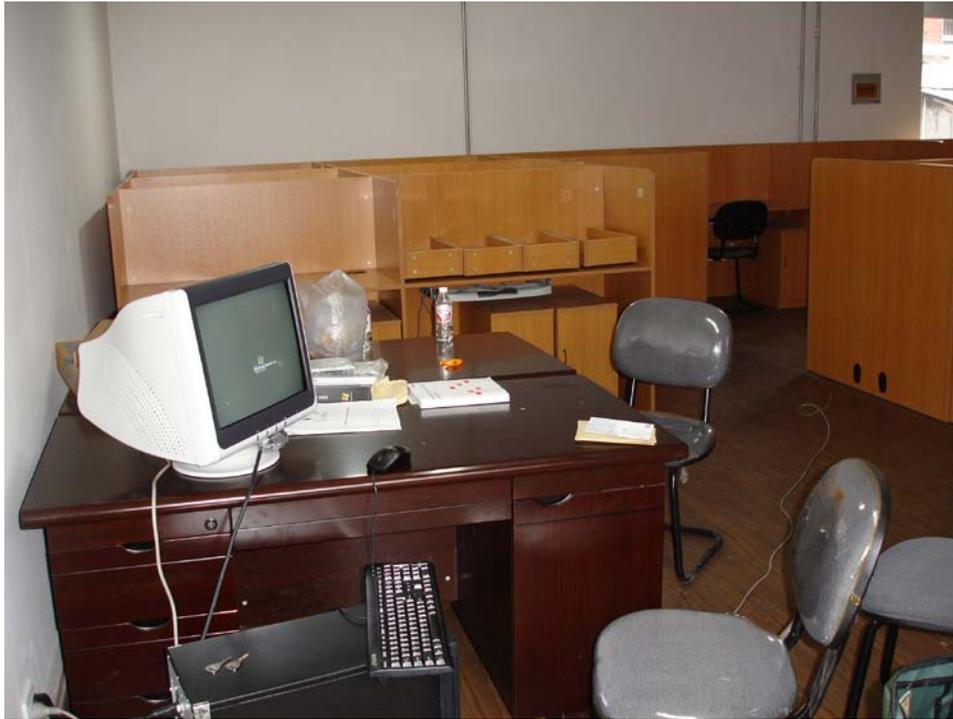


Cultural seminar (copyrighted by DLUT News Center)

In addition to our academic endeavors in the fields of electrical engineering and computer science, DLUT also arranged a cultural seminar in which any student, regardless of departmental background, was encouraged to attend. Elysa initiated the seminar with a short Powerpoint presentation on American life and MIT culture. Naturally, the dialogue was conducted in English, and many interesting questions and comments were made as the students gained a better understanding of our personal background, of our purpose here at DLUT, and of the cultural differences at the other side of the globe.

I also personally attended several “English Corners” held twice a week during the evening, which proved to be just as rewarding and interesting as the cultural seminar. Besides, it was a great way to make new friends and find Ping-Pong partners.

## iLabs



The Service Broker in the iLabs office

The core project was the set-up of a local Service Broker at DLUT. The essence of the iLabs project is a set of real-time online laboratories that allow users around the world to access specific remote laboratory resources that might not be reachable within the user's locale. Currently in development, iLabs at MIT already include experiment setups ranging from polymer crystallization to an earthquake shake table. The particular iLab at DLUT is the Microelectronics iLab, which allows users to request experiments involving a variety of microelectronic devices and receive data results within a minute. The Service Broker is a local server that manages and organizes lab experiments sent from DLUT.

The work was challenging in the sense that we were setting up a connection between two totally different environments – the most significant difference being the language barrier. To summarize, almost all of the bugs were due to network problems – firewalls, proxies, ports, anti-virus ... etc. Bad timing also played a role: a newer version of iLabs architecture came out right after we left for Dalian; moreover, the lab relocation of the hardware at MIT during the last two weeks broke the lab client, which caused some confusion and frustration. In general, we tackled through a lot of unexpected errors, such as the disappearance of the device graphics. Although the 12-hour difference made communication quite inconvenient, the support team back at MIT helped us graciously and promptly throughout the duration of the internship. Fortunately, the connection between DLUT and MIT was finalized just in time for our last Microelectronics class, and our students were duly impressed by the speed of lab result retrieval while Harold and I rejoiced in our completed mission.

Needless to say, setting up the Service Broker at Dalian has greatly enhanced the global expansion of the iLabs project. Granted, iLabs at DLUT is still in its nascent stage, but the future is potentially boundless. For instance, DLUT could eventually create new iLabs that incorporate their own experimental hardware, thereby possibly serving as a central iLabs “hub” for the entire China region. Most importantly, any new projects in upcoming years will surely be implemented at a faster pace, since the MIT teams sent to DLUT in the future will learn from our networking experiences and enjoy much smoother communications between the two universities.



Of course, we did not spend all of our time working – some Mechanical Engineering sophomores invited us to a beach BBQ

## Weekly Teaching Syllabus

Due to unforeseen problems, we were forced to change our teaching plans many times, sometimes in the middle of class. The following syllabus portrays what actually happened, which is quite different from the very first syllabus designed before the start of any classes. Despite the complexities, the nature of this internship created a very exciting and dynamic experience.

Out of a total of six weeks spent at DLUT, the middle four weeks were devoted to teaching. During the first week, several presentations and meetings with the DLUT staff were held in an effort to work out a general teaching plan. The last week was spent on maintaining the iLabs server and making sure that everything was indeed working before the program ended.

In the following syllabus, **blue** represents the Java class, and **red** represents the Microelectronics class.

### *Week 1*

**Tuesday June 7<sup>th</sup> 6:00pm – 8:35pm Course: Java**  
Introduction, toilet-paper icebreaker; software installation; HelloWorld program

**Wednesday June 8<sup>th</sup> 6:00pm – 8:35pm Course: Java**  
Software installation; lecture and lab on variables and data types, operators

### *Week 2*

**Tuesday June 14<sup>th</sup> 6:00pm – 8:35pm Course: Java**  
Lecture and lab on control structures, arrays

**Wednesday June 15<sup>th</sup> 6:00pm – 8:35pm Course: Java**  
Labs on GradeBook 1 & GradeBook 2; lecture on methods

**Friday June 17<sup>th</sup> 1:30pm – 3:10pm Course: Microelectronics**  
Installation of 6.004 courseware; lecture on CMOS; demonstration of gate simulation via JSim waveforms using NFETS and PFETS

**Sunday June 19<sup>th</sup> 10:05am – 11:45am Course: Microelectronics**  
More simple circuit designs with JSim; intro to gate-based design at the end

### *Week 3*

**Tuesday June 21<sup>st</sup> 6:00pm – 8:35pm Course: Java**  
Lecture on classes and objects; labs on GradeBookOO 1 & GradeBookOO 2

**Wednesday June 22<sup>nd</sup> 6:00pm – 8:35pm Course: Java**

Lecture on lists and iterators; lab on GradeBookOO 3; lecture on some new features in Java 1.5

**Friday June 24<sup>th</sup> 1:30pm – 3:10pm Course: Microelectronics**

Review of gate-based design in JSim; lecture on sum expression and carry-on expression of a full adder; attempt to register iLabs accounts

**Sunday June 26<sup>th</sup> 10:05am – 11:45am Course: Microelectronics**

4-bit adders, 5-bit adders, and other variations; iLabs registration and tutorial; attempt to use iLabs

*Week 4*

**Tuesday June 28<sup>th</sup> 6:00pm – 8:35pm Course: Java**

Clarification on differences between Java 1.4 and 1.5; Lecture on static and final; Lab on RaceCar 1

**Wednesday June 29<sup>th</sup> 6:00pm – 8:35pm Course: Java**

Fun graphics lab with Swing; short wrap-up and farewell at the end

**Friday July 1<sup>st</sup> 1:30pm – 3:10pm Course: Microelectronics**

Retry iLabs connection; work on MOSFET and diode; experiment with other devices; Q&A session followed by farewell