Computing Tutorial　　　　　Grinnell College　　　　　Fall, 2004

Computing: Limitations and Promising Developments

Formal Description
(.dvi format / postscript / pdf format)

Schedule
(.dvi format / postscript / pdf format)

Themes　Goals　Class Questions　Instructor　Textbooks　Course Work

Writing　Labs　Disabilities　Comp.Accts.　Grading

This tutorial provides a balanced perspective of computing, including discussions of several areas of contemporary computing research and considerations of both theoretical and practical applications of computers and technology. A formal description of this tutorial is available in dvi, postscript, and pdf formats.

While some details are expected to evolve through the semester, a tentative schedule for this course and statements of the various paper assignments are available via links from this page. Students should check these course pages regularly for updated information.

Themes

This tutorial will consider two promising areas of current research in computer science: artificial intelligence (especially expert systems and neural networks) and multi-processor computing (including parallel algorithms, distributed systems, and the World Wide Web). Each of these research areas provides perspectives on problem-solving, and this tutorial will explore each of these perspectives in some detail. Artificial intelligence studies both how the human mind might function and approaches for solving problems often associated with intelligent decision making; parallel algorithms involve problem-solving approaches which take advantage of multiple processors; distributed systems utilize networks of machines for the storage and processing of data; the World Wide Web distributes information storage and processing on independent machines spread throughout the world. For each of these topics, discussion will cover basic concepts, sample applications, and directions of current research. In addition, the tutorial will identify factors that limit how computers may be used. Results from the theory of computation show that some problems are inherently not solvable, while practical considerations restrict the nature of the solutions that may be found for other problems.

Goals

Study of each theme will include consideration of basic concepts and approaches, directions of current research, and, whenever possible, some first hand experiences. In addition, the following goals are common to all tutorials:

- Attention to the writing process
  - Class discussion of issues in writing
  - Assignments include completion of four papers
  - Experience with rewriting and editing

- Experience in researching a topic
  - Discussion of research strategies and the use of library resources
  - Assignments involving library research

- Experience with oral presentation of research
  - Participation in class discussions
  - Presentation of results of library research

Instructor

Henry M. Walker

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Office hours are posted weekly on the bulletin board outside my office.
Additional hours can be scheduled by appointment.
If you wish, you may reserve a half hour meeting by signing up on the weekly schedule.

Textbooks

Jack Copeland, *Artificial Intelligence: A Philosophical Introduction,* Blackwell Publishers, Oxford England and Cambridge MA, 1993.

Toby Fulwiler and Alan R. Hayakawa, *The College Writer's Reference, Third Edition*, Prentice Hall, 2002.

Henry M. Walker, *The Tao of Computing: A Down-to-earth Approach to Computer Fluency,* Jones and Bartlett Publishers, Boston MA, (expected) 2004.

- It is possible that this textbook will not be published at the beginning of the semester. If this is the case, then individual chapters will be distributed to class members as needed until the published version appears. Click here from an on-campus workstation for an index of available materials.

In addition, numerous articles and references will be assigned. In most cases, these will be distributed in class or available at Burling Library's Reserve Desk.

Schedule

The class meets on Tuesdays and Thursdays, from August 30 through October 18 and from October 30 through December 13. Depending on the plans for a particular day, the class will begin at 8:00 or 8:30 am; all classes will finish by 10:00 am.

While the schedule for this course may evolve somewhat, a *Tentative Class Schedule* is available in dvi, postscript, and pdf formats.

Also, if you are logged into the departmental network and want a copy printed, click duerer to have a copy printed on the printer *duerer*, and click pacioli to have a copy printed on the printer *pacioli* .

Course Work

Course work will involve a combination of the following activities.

1. **Research Exercises:** Scholarly inquiry regularly requires the investigation of topics. In today's society, this investigation sometimes may involve electronic sources, but other investigations may require a search of printed materials. This tutorial will contain several research exercises to help students become proficient in the location and analysis of materials.

2. **Academic Honesty Exercise:** Since academic work consistently must include appropriate citation and referencing, all tutorials include work related to academic honesty and citation. An academic honesty exercise must be satisfactorily completed.

3. **Class Questions:** To encourage preparation for class, the tentative class schedule (.dvi format / postscript / pdf format) specifies several class periods for which students are to prepare class questions. For such classes, students will be expected to submit (via blackboard) two questions on the readings by 5:00 pm on the day before class. While may types of questions are appropriate (e.g., open-ended, clarifying, connective and relational, involving value conflicts), simple factual questions should be avoided (unless the facts are in dispute).

4. **Class Participation:** Some classes will begin with one or two students reviewing in a few sentences the main arguments of the author of a recent reading. Students also should be prepared to indicate what conclusions they have reached regarding recent reading. All students are expected to participate actively in discussions.

5. **Oral Presentations:** Several times during the semester, each student will be expected to make presentations to the class. At first, these presentations may give summaries of readings. Toward the end of the semester, these presentations may include ten-minute discussions of a student's research into a topic.

6. **Papers:** Four papers will be due throughout the semester. In addition, assignments will include the rewriting and editing of papers and the reviewing of other papers.

Notes:

- Speaking from personal experience, each student should make a special effort to make at least two or three comments during each of the first few classes. This initial participation tends to make later participation seem much easier and more natural.

- All written homework, including the academic honesty exercise and all papers, must be prepared using a computer-based, word-processing package. (Typing of a paper using a traditional typewriter is not acceptable in this course.)

  Please note that each student is responsible for all aspects of each paper, including spelling and grammar. Although word-processing packages may help identify possible mechanical errors, these packages sometimes provide incorrect guidance and suggestions. Thus, *when using a word-processing package, students are strongly encouraged to **turn off** any auto-correction mechanism.* Highlighting of possible problems may be helpful in locating passages that require scrutiny, but auto-correction places students at the mercy of imperfect computer programs and should be avoided.

- **Each student must turn in two paper copies of each written exercise,** except that additional copies are required for paper 4 (as specified on that assignment). One copy will be returned to the student with comments on content and with suggestions for improving writing, and one copy will be saved in the student's advising folder.

Students with Learning Disabilities

If you have specific physical, psychiatric, or learning disabilities and require accommodations, please let me know early in the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the Director of Academic Advising. Feel free to talk to me if you have questions or want more information.

Computer Accounts

In addition to general computer accounts which are assigned when they students register at the College, all students in this class will receive accounts on the departmental Linux computers. Some class activities will involve the use of these departmental machines.

Grading

The final grade in this course will be based on both the quality of the submitted papers and the student's participation in class discussions.

Note: I would be very happy to discuss any part of the course with anyone at any mutually convenient time. Do not hesitate to ask questions or to make comments.

This document is available on the World Wide Web as

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http://www.cs.grinnell.edu/~walker/courses/tutorial.fa04/
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For more information, please contact Henry M. Walker at (walker@cs.grinnell.edu)