❒ Undergraduate Program

In our undergraduate program, we aim to provide students with an overall understanding of the computer science field, a solid grasp of fundamental theory and key concepts, and the skills to apply theory to diverse areas. We expose students to engineering aspects of computer system design and implementation.

The undergraduate curriculum is structured into three tiers: introductory, basic core, and applied courses. Introductory courses are: Introduction to Computer Science, Problem Solving, Discrete Mathematics, Data Structures, Digital Systems and Lab, and System Programming. Basic core courses are: Algorithms, Microprocessors and Lab, Computer Organization, Programming Languages, Formal Languages and Automata, Operating Systems and Lab, Introduction to Database and Symbolic Programming. Applied courses include Introduction to Logic for Computer Science, Introduction to VLSI design, Compiler Design, Computation Theory, Data Communication, Introduction to Computer Networks, Software Project, Introduction to Software Engineering, Introduction to Artificial Intelligence, and Introduction to Computer Graphics. Seminar courses are also offered to cover latest research topics. That our undergraduate students have won many awards in computing festivals and international programming competitions attests to the strength and depth of our curriculum.

❒ Graduate Program

The department admitted its first master's degree students in 1973, and six master's degrees were produced in August, 1975. The first PhD student was admitted in September 1975, and the first PhD was granted in 1979. As of February 2007, the department has produced 1436 masters and 448 PhDs.

The graduate program targets producing masters and PhDs who are strong in both advanced theory and application, with an emphasis on experimental approaches. Basic courses are categorized into the following three areas: theory, systems, and software. All students are required to take one course from each area, and then take advanced courses in one area of research interest. To actively seek out and expose students to the latest breaking technologies, special topics seminars are offered in artificial intelligence, distributed and parallel processing, next generation computing, software portability, VLSI and computer architectures, multimedia, fuzzy logic, computer graphics, virtual reality, etc. Our curriculum is flexible enough for a student to consult one's advisor and design a program that suits one's research needs and eventually publish extensively in domestic and international journals and conference proceedings.

❒ Research Groups

The members of the department in 2006 alone have published 84 journal papers, including 63 in international journals, and received total of $10.1 million USD in research grants. The following are major research areas of the department.

1. Theory of computation

Theory of computation is a fundamental area of research that provides a theoretical framework and basis to all fields in computer science. Topics covered in this group are: algorithms, graph theory, computational geometry, and its applications to parallel processing, VLSI, graphics, and robotics. Scheduling algorithms in parallel computing architectures are also studied.

2. Computer Architecture

The main research areas of the Computer Architecture Group are diverse and ever-evolving: high-speed parallel processing, state-of-the-art super-scalar micro-architectures, real-time systems, and multimedia-supporting operating systems. Recently, the group's research interests expanded to include high-speed router / switch architecture, mobile computing, cluster and grid computing.

3. Programming Languages

The goal of research in programming languages is to analyze and design desirable language features, and to implement them and their supporting environments. Semantic and syntactic structures of programming languages and optimization techniques in implementation lie at the heart of the problem. There are several active areas of research: efficient verification of syntactic structures, prediction methods for program output, new paradigms (applicative, imperative, mobile, logic, object-oriented, and functional languages) and their specialized theory and implementation techniques. Application-specific languages, such as in multimedia authoring, and smart code generation techniques for globally networked computing are some of the newer additions in this area.

4. Networking

Networks provide the infrastructure for smooth information flow in this age of information. In networking research, we study issues related to internetworking, multicasting, and various forms of group communication. To validate analytical results and verify networking requirements, we experiment with Internet caching and multimedia teleconferencing. Also, spurred by recent advances in physical layer technologies, we are expanding to cover more diverse topics, such as overlay networks, wireless and mobile networking, and home networking.

5. Software engineering

Software engineering is considered as the core technology in computer industry. Software is already used in every corner of our life, and often in situations that require extremely high dependability (e.g., autonomous pilot mode in flight control). Software engineering deals with systematic and economic approaches in high-quality software production, quality control, maintenance, and repair. More specifically, our current research interests are: methodologies for software development and quality guarantee in software systems that require high dependability, distributed and parallel system software development, object-oriented software technologies, and computer securities.

6. Databases

Databases are integral parts of today's information infrastructure. In this group, we develop high-performance database systems for very large-scale data manipulation and processing, and extend their applications to multimedia and distributed information systems. We also cover object-relational databases, search engines, mobile wireless information systems, semi-structured document databases, geographical information systems, information retrieval and distributed transaction processing. Other areas of active research include database access and applications in the Internet.

7. Artificial intelligence

The goal of artificial intelligence is to allow computers and machines to perform tasks that can currently only be performed by humans. In order to emulate human vision and hearing, character recognition, speech recognition, image processing, and computer vision have been much studied as the founding blocks of artificial intelligence. Moreover, recent research topics include intelligent robots that can make autonomous decisions in a complex environment, and enhanced human computer interfaces that use virtual reality and gestures.

8. Natural language processing

The goal of this group is to closely examine linguistic phenomenology by studying human languages, the main medium of expressing information, and to enhance human linguistic information processing capability with the aid of computers. Specific areas of research are: natural language morphology analysis, syntactic analysis, semantic interpretation, machine translation, information summarization, classification, and retrieval. In particular, we conduct much research on Hangul and Korean language-related issues.