# Graduate School of Knowledge Service Engineering

URL: http://kse.kaist.ac.kr

Tel : 042-350-1602~3

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## ▣ Background

The Graduate School of Knowledge Service Engineering at KAIST was established in 2009 as the FIRST academic program with the name in the world. The new program reflects KAIST's strong vision for the IT ecology of 21st century and its resolution to take initiative in this very important emerging area. We are living in a knowledge society where human's knowledge-intensive tasks, centered on decision-making, become increasingly more critical and valuable components throughout our economy activities, ranging from the conventional manufacturing and transportation systems to the financial, educational, government and social systems. Decision making takes knowledge as its fuel. Although today's information network provides huge amount of information that is readily accessible and affordable, human decision makers seldom fully utilize it as effective knowledge, suffering from information overload due to their own cognitive limitations, ill-tuned communication, and ill-designed cooperation between humans and machines. It is a tall mission to solve this bottleneck that requires both profound academic understanding and innovative ideas. Knowledge Service Engineering takes this mission.

## ▣ The Interdisciplinary Study and Application Areas

The Graduate School of Knowledge Service Engineering pursues to realize high-performance joint cognitive systems that comprise both the human and the information network, designing high bandwidth knowledge connection between them. To enhance human decision making with computer aids and information, interdisciplinary research based on two pillars is called for: cognitive engineering on human side and intelligent knowledge processing on computer side (See the above figure). In the human-cognitive pillar, one needs to understand cognitive science and human decision characteristics, while knowledge modeling and processing, data mining, and AI technologies have to be mastered in the computing intelligence pillar. These diverse basic disciplines are integrated through human-computer interaction design and system engineering principles. Thus, the education and research of the graduate school can be categorized into five fields: human cognition and decision making, computing intelligence, human-system interaction, knowledge-based systems engineering, and contemporary paradigms of knowledge service systems.

Albeit new in academia, Knowledge Service engineering already signifies one of the most prospective new trends in economy. OECD defines Knowledge Intensive Business Services (KIBS) as "services which rely heavily upon professional knowledge, and either supply products which are themselves primarily sources of information and knowledge to their users, or use their knowledge to produce services which are intermediate inputs to their clients' own knowledge generating and information processing activities, having

other businesses as their main clients." One may well take this as defining the application areas of the graduate school. Korean government also defined Knowledge Service Industry analogously and included it among the seven new growth power industries. It embraces financial services, marketing and advertizing, education and training, health care services, consultancy services, technical engineering services, smart logistic services, as well as IT and contents services. These are all immediate target areas of knowledge service engineering.