Robots: an autonomous distributed robot system that keeps looking, computing, and moving

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Research interests
Distributed algorithms,
recommender systems

Enabling numerous computers on a network to move and collaborate smoothly

I specialize in distributed algorithms and recommender systems. These are, in fact, entirely different subjects, but they have become two main pillars of my research as I have continued my research following my interest.

Distributed algorithms are for distributed systems, which are systems in which several computational entities with communication functions are connected to one another via communication links. The Internet is a distributed system. Computational entities can be computers, such as our personal computers, smartphones and other mobile devices, and robots with communication functions. Distributed algorithms efficiently solve problems on a distributed system comprising many computational entities linked in a network. If you think of large network systems such as the Internet, you can easily see that it is difficult for computational entities in a distributed system to be accurately aware of the configuration of the overall system at all times. So distributed algorithms only express how computational entities behave
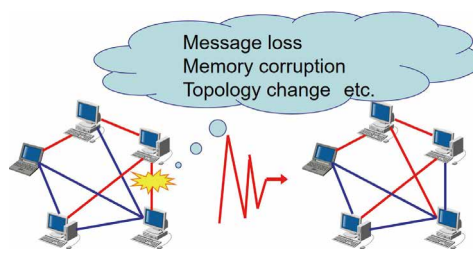
Self-stabilization: a self-stabilizing distributed algorithm resistant to temporary failures

based on their own states and the states of a subset of computational entities directly connected to them. In other words, distributed algorithms must be designed so as to allow computational entities to function well based on local information within the system, consequently causing it to behave as a well-coordinated whole.

As the scale of a system becomes larger, various dynamic changes occur, such as the failure of computational entities and communication links and changes in network topology following the displacement of computational entities. I design logical mechanisms that enable uninterrupted services even during such changes. Anticipating all sorts of situations and repeating the process of trial and error can be extremely challenging, but the joy I feel when I succeed in theoretical demonstration is the best part of my research.

As for the other pillar of my research, I am looking into the development of recommender systems mainly using textual information, such as SNS and reviews. There are many reviews of products and services posted on the Internet by customers and users, for example, on hotel reservation websites and e-commerce websites. Sometimes it takes a lot of effort to find what really matches what you consider valuable. So it is now necessary to develop systems that recommend reviews to read or products to choose from without the trouble of actually reading the reviews. There is also an enormous amount of information on products, travel destinations, and so forth on Twitter and other social networking sites that might be utilized for recommender systems. I am working on system development with a keen interest in identifying useful pieces of information on such sites and effectively utilizing them.

Prof. Kamei initially wished to be a social science teacher. She discovered the pleasure of mathematics in high school and decided to major in engineering in college, partly encouraged by her programmer father. She continued her studies to obtain her doctorate, teach in college, and be a researcher. She says, "As a researcher attached to a university, I also teach classes and instruct students. So my original aspiration has partially come true in my profession. I truly believe that you can find your way unexpectedly by daring to try many different things without limiting yourself and your possibilities."

Sightseeing spot recommender system: system that supports the creation of sightseeing routes by recommending sightseeing spots and routes that connect them

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- MBR Center
- Hiroshima Drug-Delivery Research Center Using Photoirradiation
- Educational Vision Research Institute
- The Research Core for Plant Science Innovation
- Integrated Research Center for Smart Biosensing
- The Research Center for Japanese Foods

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