



Knowledge Science

SPRING SEMINAR

Thursday March 27th 2014

- 09:30 *Experimental Semiotic Study on Displacement in Communication*
Professor Takashi Hashimoto and Ms Kaori Tamura
- 10:00 *Implicit and explicit knowledge about speech: The case of the glottal stop*
Professor Holger Mitterer
- 10:30 *Dimensional Clustering: Finding Invariants Under Smooth Transformation*
Dr Shohei Hidaka
- 11:00 Coffee break
- 11:30 *Knowledge acquisition through averaging: The example of other-race faces*
Professor Ian Thornton
- 12:00 *Using Systems Methodologies for Knowledge Management*
Professor Taketoshi Yoshida
- 12:30 *Exploring embedded knowledge for design creativity*
Professor Yukari Nagai
- 13:00 Lunch
- 14:00 *Umbrellas, Arches, and Centaurs: Possible metaphors for Knowledge Science*
Dr Clive Zammit
- 14:30 *Possibilities of knowledge science or knowledge sciences*
Professor Tsutomu Fujinami
- 15:15 *Knowledge Science or Knowledge Sciences*
Discussion JAIST and MaKS academics

Venue: tbc. Entrance is free but prior reservation should be made by sending an email to:
elton.mamo@um.edu.mt



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Talk abstracts

09:30 | Professor Takashi Hashimoto and Ms Kaori Tamura

Experimental Semiotic Study on Displacement in Communication

Displacement is the ability to refer to things that are spatially and temporally remote. It is one of the important features of human language. We consider displacement in the context of communication in order to clarify what is truly unique to human language. We suggest that “displaced communication” to share knowledge that one party in communication has not known is the unique feature. We further examine how displaced communication takes place by experimental semiotic approach. Experimental semiotics is an emerging field which studies how novel communication systems or novel structure on symbol systems develop by conducting controlled studies of communication. Using a graphical communication task, we show that cultural evolution from iconic to figurative symbol systems in a repetition of sender’s symbol extension and receiver’s meaning generation is important in realization of displaced communication.

10:00 | Professor Holger Mitterer

Implicit and explicit knowledge about speech: The case of the glottal stop

Our experience of recognizing written words makes us underestimate the feat of recognizing spoken words. In contrast to written language, spoken language contains neither breaks between words nor invariant signatures for words: While the word “computer” is always spelled like that, “puter” is an attested realization in spoken language. Another example of lack of explicit knowledge about speech is that few speakers of English know that they frequently use a sound called “glottal stop”. Despite this lack of explicit knowledge, this sound is often inserted in sequences such as “shiny apple” to prevent the clash of the two vowel like sounds /i/ and /æ/ and some speakers (e.g. with a London accent) may use the glottal stop to replace /t/, in words such as “butter”. In this talk, I will argue that, despite its variability, the glottal stop is a phoneme in Dutch and German, even though it is not coded in the script. In fact, the data show little difference between the usage of the glottal stop in Dutch and German on the one hand and Maltese on the other, where the glottal stop is represented in the written language. This shows how strongly our explicit thinking about speech is influenced by the respective writing system, while our implicit knowledge may use segments of speech we have no conscious knowledge of.

10:30 | Dr Shohei Hidaka

Dimensional Clustering: Finding Invariants Under Smooth Transformation

Many complex systems, such as biological systems, cognitive processes, and social interactions, consist of numerous unknown nonlinear transformations in these systems. It is not an easy task to find an appropriate representation to analyze and model these systems. An alternative idea to this “finding a good model” approach is to use invariants under such unknown transformations. Dimensional clustering, a new technique which we developed recently, offers access to a class of invariants for a broad range of data sets. We show application of this technique to both simulated and empirical data sets. Considering with its generality, it can be a new tool exploring many fields in knowledge sciences. We discuss its potential uses.

11:30 | Professor Ian Thornton

Knowledge acquisition through averaging: The example of other-race faces

A constraint on any knowledge acquisition system is the rate at which relevant information can be identified and selected. Human sensation and perception has well-documented limits in this respect. How do we cope when we need to make rapid decisions in complex, socially-relevant environments? To take an everyday example, imagine arriving at a party and needing to decide if there are more men than women present or if you’re over- or under-dressed. In this talk I will briefly review evidence that one solution adopted by humans appears to be the ability to rapidly estimating the “average” along a whole range of dimensions. For example, we can accurately estimate the average,

size, location, orientation and color of objects and the average emotion, gender and identity of faces in a crowd based on exposure for only a fraction of a second. Such “ensemble” representations appear to reduce the need to process individual items in detail. Inspired by recent studies of “ensemble” face processing, my colleagues and I recently developed a new task to explore whether observers can also accurately estimate the ethnic composition of a crowd of faces. I will describe this task and present data from two experiments showing that observers can rapidly estimate the racial composition of a group of faces, but these estimates are biased by their own race.

12:00 | Professor Taketoshi Yoshida

Using Systems Methodologies for Knowledge Management

In this talk, I will show two examples of the implementation of systems methodologies for knowledge management: Soft Systems Methodology (originating from Lancaster) and Design Thinking (originating from IDEO and Stanford University). At first, I will discuss these methodologies in terms of single-loop and double-loop learning. Then I will clarify that these methodologies can be viewed as means to cultivate knowledge creation abilities amongst project members: for example, the ability to identify key technical factors and/or create concepts for product development, organizational change, service design, etc. In understanding how these methodologies can be useful for knowledge management practice, we can draw on useful theories from brain science instead of the philosophy of tacit knowing.

12:30 | Professor Yukari Nagai

Exploring embedded knowledge for design creativity

Design education across all domains-products, communications, and engineering among others-changed during the 1990s. Conventional design education that was directed toward “how” changed into education that was “what” oriented. There are two paths toward design competences to gain the interdisciplinarity required to meet the design demands of 21st century society: fostering strategic knowledge as a “designerly ways of knowing” and concept generation at the very early stages of the design process. Both paths are an integral part of studies into “design cognition,” which is closely related to creative cognition. This presentation introduces important issues of design cognition, including recent research investigating design creativity as it relates to embedded knowledge in society (Nagai 2014), and advanced issues on a methodology of design innovation.

14:00 | Dr Clive Zammit

Umbrellas, Arches, and Centaurs: Possible metaphors for Knowledge Science

14:30 | Professor Tsutomu Fujinami

Possibilities of knowledge science or knowledge sciences

We have been establishing knowledge science as a discipline for seventeen years and find it still difficult to explain what knowledge science is. Our encounter with people at Faculty of Media and Knowledge Sciences led us to another view to the subject, where 'knowledge sciences' is taken to be an umbrella term. We present our lecture of knowledge science taught to our students to see how various topics can be dealt with under the name of knowledge science by a handful lecturers and what students learn through the course. We go through proposals submitted by participants to the question, how knowledge science can be applied to our lives. Those proposals depict their perceptions to the subject, some of which show an amalgamation of technology and social issues.