Obituary

Martin Kay

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It is with great sadness that we report the passing of Martin Kay in August 2021. Martin was a pioneer and intellectual trailblazer in computational linguistics. He was also a close friend and colleague of many years.

Martin was a polyglot undergraduate student of modern and medieval languages at Cambridge University, with a particular interest in translation. He was not (yet) a mathematician or engineer, but idle speculation in 1958 about the possibilities of automating the translation process led him to Margaret Masterman at the Cambridge Language Research Unit, and a shift to a long and productive career.

In 1960 he was offered an internship with Dave Hays and the Linguistics Project at The RAND Corporation in California, another early center of research in our emerging discipline. He stayed at RAND for more than a decade, working on basic technologies that are needed for machine processing of natural language. Among his contributions during that period was the development of the first so-called chart parser (Kay 1967), a computationally effective mechanism for dealing systematically with linguistic dependencies that cannot be expressed in context-free grammars. The chart architecture could be deployed for language generation as well as parsing, an important property for Martin's continuing interest in translation.

It was during the years at RAND that Martin found his second calling, as a teacher of computational linguistics, initially at UCLA and then in many other settings. He was a gifted and entertaining speaker and lecturer, able to present complex material with clarity and precision. He took great pleasure in the interactions with his students and the role that he played in helping to advance their careers. He left RAND in 1972 to become a full-time professor and chair of the Computer Science Department at the University of California at Irvine.

His time at Irvine was short-lived, as he was attracted back to an open-ended research environment. In 1974 he joined with Danny Bobrow, Ron Kaplan, and Terry Winograd to form the Language Understander project at the recently created Palo Alto Research Center (PARC) of the Xerox Corporation. The group took as a first goal the construction of a mixed-initiative dialog system using state-of-the-art components for knowledge representation and reasoning, language understanding, language production, and dialog management (Bobrow et al. 1977). Martin took responsibility for

the language production module, which was initially based on the quite rudimentary technology of the time.

That was the beginning of his focus on "reversible grammars," grammatical rules and representations that could be applied to parse strings into their underlying syntactic representations but also convert underlying representations back to the strings that express them. He and his colleagues at PARC developed the idea of hierarchical attribute-value structures (feature/functional structures) as underlying representations that could be characterized by the primitive predicates of equality and unification. This insight took form in his Functional Unification Grammar (Kay 1979) and in Lexical Functional Grammar (Kaplan and Bresnan 1982), and it also surfaced in the design of Head Driven Phrase Structure Grammar (Pollard and Sag 1987).

Reversibility, for translation as well as dialog, was also the motivation at PARC for developing the mathematical, linguistic, and computational concepts that led to the use of bi-directional finite-state transducers for phonological and morphological description (Kaplan and Kay 1994). This technology is still being applied to a wide variety of language processing problems. But for Martin translation was always a central theme, bracketed by his early article "The Proper Place of Men and Machines in Language Translation" (which circulated in research for quite some time before it was finally published [Kay 1997]) and his most recent book (Kay 2017).

In 1985 Martin struck a new balance between his commitment to research and his love of teaching by officially dividing his time between his prestigious role as a Research Fellow at PARC and a professorship in the Linguistics Department at Stanford. In addition to his Stanford professorship, he also taught (1998–2014) as an Honorary Professor at Saarland University, offering one or two courses every year. During his stays in Germany, he also advised on ongoing research, and his lectures and discussions helped in the gradual integration of programs in linguistics, computational linguistics, and translation studies.

Martin contributed in many other ways to international progress in computational linguistics. In the 1970s and later he was a mainstay lecturer in the International Summer Schools in Computational Linguistics in Italy, and the Nordic summer schools in Scandinavia (actually, he and his wife Iris hosted one Nordic summer school at their home in Menlo Park). He advised research organizations and projects in several countries. He was a specialist advisor to the German Ministry of Education and Research, a reviewer for the two largest European projects in automatic translation, Eurotra and Verbmobil, and a valued advisor for projects at the German Research Center for Artificial Intelligence (DFKI). He also served for many years as chairman of the International Committee for Computational Linguistics (ICCL).

Martin received many honors during his lifetime. He is a past President of the Association for Computational Linguistics (ACL). In 2005 he received the ACL Lifetime Achievement Award (Kay 2006). He was awarded honorary doctorate degrees from the University of Gothenburg (1982) and the University of Geneva (2008). He was the recipient of the Okawa Prize in 2019.

Martin's quiet and modest style of personal interaction stood only in apparent contrast to his widely recognized fame as an intellectual leader. His impressive expertise in several disciplines and his diverse intellectual interests made him a wonderful conversation partner for colleagues and friends who were lucky enough to be able to spend time with him. All students and colleagues remember him as a gifted speaker who was able to captivate and convince his audience with excellent didactics, rhetorical sharpness, and his very own sense of humor.

We also remember Martin's wife, Iris Kay, who predeceased him by a few months. Iris was a warm and psychologically insightful figure who played a prominent role in the early social history of computational linguistics, when personal relationships were more immediate and so important. They will both be sorely missed.

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