

people
to know
**LONG ON
MEMORY**

Holocaust survivor Steven Fenves, a pioneer of computer-assisted structural engineering who made the AISC *Specification* more accessible, is helping society never to forget.

STEVEN J. FENVES knows a lot about memory, both the computer kind and the personal kind. Consider two examples—he met one of his challenges as a 1960s developer of computer programs by applying the then-new technique of dynamic memory allocation. Earlier, at the age of just 13, he survived the Holocaust when he was among those liberated in April 1945 from Buchenwald, his fourth concentration camp. Those latter memories he would stash away for nearly three decades.

Despite his early experiences, Fenves has done more than most to facilitate the practice of structural engineering. Fifty years ago, in 1961, Fenves had just completed his Ph.D. when he received an offer to spend a year at M.I.T. Inspired by the introduction of COGO, the general surveying computer application, he embarked on the development of a similar program for structural engineers.

Collaborating with colleagues at M.I.T., he developed STRESS, short for STRuctural Engineering System Solver, a language for structural analysis. Shortly thereafter, when IBM was introducing a new small computer to the engineering community, many firms said they would only buy or lease the computer if it supported STRESS. “Thus was the IBM 1120 STRESS born,” Fenves wrote in a 2007 conference keynote address (available at <http://bit.ly/vP4pcy>), “and thus was a first generation of structural engineers introduced to matrix structural analysis.” STRESS soon metamorphosed into STRUDL, short for STRUctural Design Language, which ultimately gave rise to the high-powered analysis tools in use today.

Fenves noted in the same paper that in retrospect he was proud of what the team had accomplished. “On the other hand, it is sobering to reflect that my most significant contribution to the profession was made when I was 32 years old.”

But that is arguably an understatement, particularly for any-

one who uses the AISC *Specification*. After learning about tabular decision logic, also known as decision tables, Fenves applied it to modeling the often-complex chain of reasoning in engineering. A paper he wrote on the subject in 1966, which used provisions from the AISC *Specification* as examples, came to the attention of T.R. Higgins, then AISC director for research. Higgins eventually gave Fenves a contract to present all the specification provisions in decision table format. This work ultimately led to a proposal for a significant restructuring of the specification. That reorganization was incorporated into the first LRFD *Specification* in 1986, and then in the 1989 ASD *Specification* as well, simplifying its use from that time forward.

Meanwhile Fenves had moved to Pittsburgh in 1971 with his wife, Norma, and their four children to join the faculty of Carnegie-Mellon University. It was shortly thereafter that he began to realize that as a survivor, he needed to act as a witness and share his experience with others.

“In the early 1980s we formed a Holocaust Survivors Organization in Pittsburgh, supported by the United Jewish Federation,” said Fenves, who was the group’s founding president. The survivors played a vital role in the larger organization. “For all practical purposes, we were the Federation’s Speakers Bureau on the Holocaust,” Fenves said. Over the years he has given more than 50 talks to various organizations.

Upon retiring from Carnegie-Mellon in 1999, Fenves embarked upon a decade of research at NIST in Gaithersburg, Md. Since his second retirement, in 2009, he has been a volunteer at the U.S. Holocaust Memorial Museum in Washington, where he can be found every Thursday. Learn more about Fenves on the museum website, www.ushmm.org, under Survivor Volunteers. You can also listen to Fenves discuss his Holocaust experience by going to <http://bit.ly/rzI02e>. **MSC**



United States Holocaust Memorial Museum, courtesy of Steven J. Fenves



Miriam Lomaskin/United States Holocaust Memorial Museum

◀ **Far left:** Steven Fenves and his sister, Estera Fenves, in 1940, shortly before the war engulfed them.

◀ **Left:** Steven J. Fenves, Holocaust survivor and volunteer.