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Gene Golub Around the World Day

Gene Golub (1932–2007) is one of the founding fathers of numerical analysis. His book Matrix Computations, coauthored with Charles F. Van Loan, can be found in every mathematics library, and his algorithms, in particular the algorithm he designed together with William Kahan in 1970 for computing singular values, have opened many new areas of scientific computing. He had an enormous number of coauthors, and has been known personally by a lot of mathematicians all around the world. To reminisce his warm personality, one has chosen to celebrate his birthday all over the world.

Friday 29 February 2008 was a very special day. On this day at least 1,000 people at 32 events around the world celebrated the 19th birthday of Gene Golub for 48 hours. Gene Golub, a well-known numerical linear algebra scientist, passed away on 16 November 2007 at the age of 75 years. It seems that the text above contains a number of contradictions, however careful reading shows that there are no errors. The Gene Golub DCSE (Delft Center for Computational Science and Engineering) Symposium [1] was part of the Gene Golub Around the World Day. This event was one of a series of similar events replicated around the world on the same day in Adelaide, Berlin, Delft, Hong Kong, Leuven, Mexico, Moscow, Oxford, Rio de Janeiro, Shanghai, Stanford, Tsukuba, Urbana-Champaign, etc.

Figure 1 Gene Golub

Personal reminiscences

In the DCSE symposium a number of international speakers presented their research and its relation to the work of Gene Golub. The subjects of the talks: singular value decomposition (SVD), Google's PageRank, preconditioned conjugate gradients, orthogonal polynomials and the interior-point method, gave a nice overview of the influence of Gene Golub on these different subjects. Most of the speakers gave personal memories of their collaborations with Gene. The main speaker, Professor Bernd Fischer (Universität zu Lübeck) explained that numerical linear algebra tools developed in collaboration with Gene are crucial in medical applications. He specifically talked about the removal of tumours from liver tissue. Before medical intervention a picture of the liver is made by a CT scan. However, during the intervention the liver is transformed. Fischer applied his mathematical tools to change the original picture to the transformed one in order to enable the medical doctor to remove the correct part of the human liver.

Achievements

Born in Chicago, Gene was educated at the University of Illinois at Urbana-Champaign, receiving his BS (1953), MA (1954) and PhD (1959) all in the field of mathematics. His MA degree was more specifically in mathematical statistics. His PhD dissertation was entitled *The Use of Chebyshev Matrix Polynomials in the Iterative Solution of Linear Equations Compared to the Method of Successive Overrelaxation* and his thesis advisor was Abraham Taub. He had been at Stanford University since 1962 and became a professor there in 1970. In total, he had about 30 PhD students and 80 academic grandchildren. Gene had been awarded several honorary degrees from a variety of institutions.

The book *Matrix Computations of Golub and Van Loan* is very influential in the domain of numerical linear algebra. The book now has three editions, has sold over 50,000 copies and has been cited over 18,000 times. Its fourth edition is still in preparation (by Charles Van Loan). Besides the book, Gene had around 20 other papers with 100 or more citations and 100 papers with 20 or more citations. He has more than 200 coauthors!

Gene had a tremendous record of service to the whole scientific computing community. He served as the President of SIAM and played an important role in the foundation of the International Council for Industrial and Applied Mathematics (ICIAM). At the ICIAM 2007 congress, he was one of the originators and the chair of the workshop 'Future Directions in Numerical Analysis'. He is the founding editor of two important SIAM journals: the SIAM Journal on Scientific Computing and the SIAM Journal on Matrix Analysis and Applications. Gene founded the NA-NET and the NA-Digest, which are important electronic networks within the numerical analysis community.

Until the end of his life Gene had an open mind and liked to collaborate with many people. Gene praised his students and said they had made him a better person. He admired their personalities, behaviour, scholarship and integrity, and said he felt fortunate that he had met many of them. The living memory of him passes but the algorithms he created will continue to be used, probably indefinitely.

References

1 ta.twi.tudelft.nl/nw/users/tang/genegolub