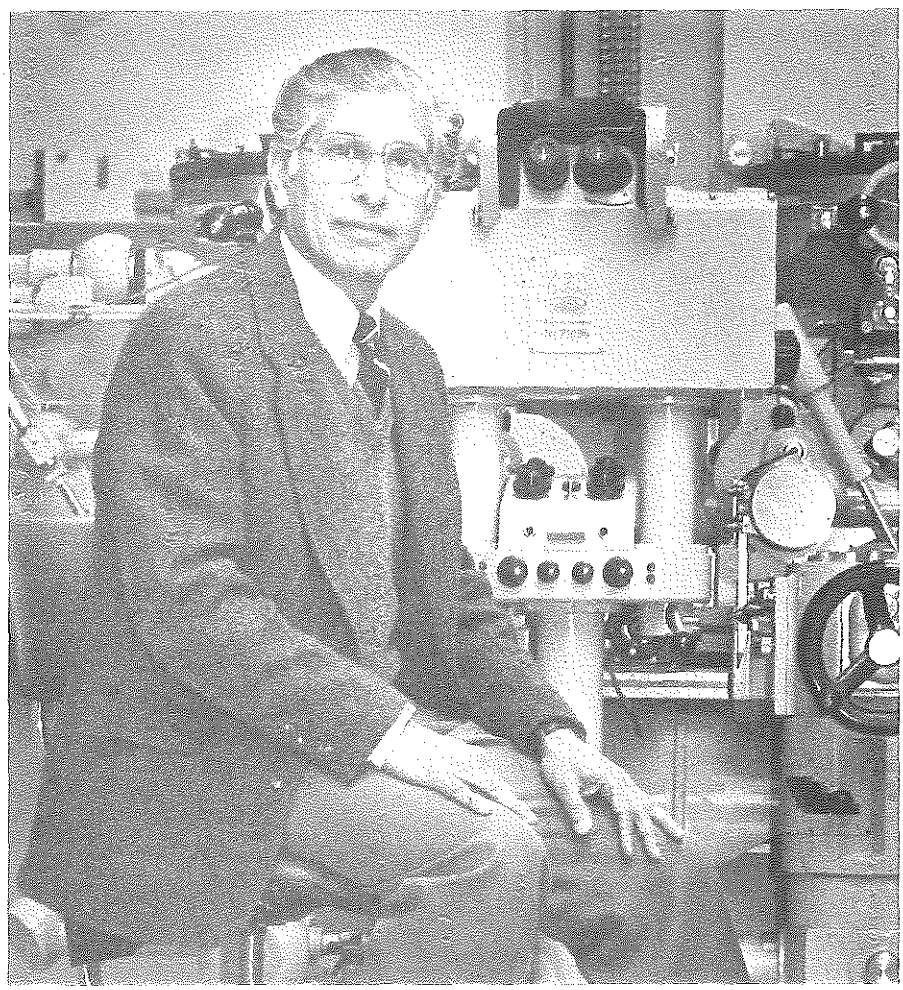
Mushtaq Hussain
Professor of Civil Engineering

As a boy growing up in Pakistan, Mushtaq Hussain's fascination with bridges sparked an early career goal. By the time he was 12 years old, he had decided to become a civil engineer. "I was convinced that the engineer who designed the Golden Gate Bridge was a greater artist than Picasso," recalls Hussain. "I could not imagine a higher calling!"

Hussain, who has ten brothers and sisters, says his family placed a great importance upon education. "Although the literacy rate in Pakistan is less than 25 percent, all ten of us were able to complete a college education. We all had a very strong commitment."

It was during his years in engineering school that Hussain developed an increasing interest in surveying engineering. Eventually, his professional interests in the area brought him to the United States. "I found that in the United States, there were so many professional opportunities to pursue and I was constantly being challenged," he says. "I did go back to Pakistan for about a year as a consultant, but it was impossible for me to maintain my professional interests." Hussain, his wife, and two sons returned to the U.S. and later became citizens.

Today, Hussain is chairman of the Department of Civil and Surveying Engineering and remains active as an engineering consultant for private industry. He is also a licensed civil engineer in the state of California.



Q: What is your area of specialization in civil engineering?

A: My major area is surveying and photogrammetry, which is basically the science of making the precise measurements essentially required for civil engineering planning. Engineers have to know what exists on the earth's surface, as well as the differences in elevation, before they can plan a highway, or a dam and other irrigation structures, or any type of transmission line or pipeline. Knowledge of the terrain and the topographical features is absolutely essential for designing man-made structures. In the past, surveyors would go out to the site and take actual measurements on the surface of the earth. But during the second world war, the development of aviation made it possible to take aerial photographs from different positions and use photogrammetric techniques to create an optical three-dimensional model of the land below. This technique continued through the early '70s. Then computer technology made it feasible to apply analytical principles and techniques for exacting precise measurements. Now we do a lot of measurements and data aquisition from aerial photography and other types of automated imagery by using computers. In fact, surveying engineering students are among the highest users of computing facilties on this campus.

Q: Has computer technology eliminated the need for surveying engineers to have field experience?

A: No, because you have to establish certain points as landmarks that serve