

# COMPUTER SCIENCE COLLOQUIUM

## “Keene Development Process SW Reliability Model: An Early Prediction Method”

**Dr. Samuel Keene**  
**IEEE Reliability**

**In conjunction with the IEEE Reliability Society**

### Abstract

How do you estimate the reliability of software before it is finally developed, inspected, tested and released? What assertions can we make about the software reliability early on in the process? Suppose you were an auditor and were asked to assess the quality of software being developed. How would you make that assessment? What questions could you ask of the management and the developers? What other metrics would you look at? Historically, some development organizations looked at their past programs and scaled the new one to have a 10% lower fault rate. The new model presented here has shape factors that merge code size, historical performance, operational profile, as well as the capability of the development organization.

This talk discusses an a priori software reliability prediction model that projects the latent fault rate of the code being released to the field along with its reliability growth profile after release. The latter results from the on-going fault discovery and subsequent fault removal. The code is refined over time and usage. This model helps set the reliability expectations for the new software, and has been successfully used by several major government contractors and development organizations. It is also referenced in the IEEE Standard for Software Reliability 1633.

### Biography

Dr. Sam Keene is a Past President of the IEEE Reliability Society and continues to serve on its Advisory Committee. He also serves on the Board of Directors of the IEEE Technology Management Council. Dr. Keene received the 1996 “Reliability Engineer of the Year,” the Allan Chop Education award from the American Society of Quality in 1999, and the IEEE Education Award in 2000. He was also recognized with the IEEE Millennium Metal and by the FAA for distinguished Service on the WAAS flight navigation system reliability.

Dr. Keene holds the office of Fellow of the IEEE for his technical accomplishments. He has produced ten video tutorials on different aspects of software development, software reliability and concurrent engineering for NASA, NTU, and the IEEE. He has published over 200 technical papers and several book chapters. Dr. Keene was the co-principal developer of the PRISM reliability model and has worked on updates of the MIL HDBK 217 models. He has been a Six Sigma Senior Master Black Belt since 1999. Dr. Keene received his PhD in Operations Research from the University of Colorado.

### The colloquium is open to the general public

Date: Friday, April 29, 2011  
Time: 1:30 to 2:30 pm  
Location: ECSS 3.910  
Host: Professor Eric Wong

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