

James L. Beck



Beck is the George W. Housner Professor of Engineering and Applied Science at the California Institute of Technology where he has been on the faculty since 1981. He is in two departments in the Division of Engineering and Applied Science: Computing and Mathematical Sciences, and Mechanical and Civil Engineering. He served as Executive Officer (Chair) for Applied Mechanics and Civil Engineering from 1993 to 1998. He has a Ph.D. in Civil Engineering from Caltech and BSc and MSc degrees in Mathematics from the University of Auckland in New Zealand.

Beck has over 340 technical publications covering topics in earthquake engineering, structural dynamics, system identification, structural health monitoring, structural control, design optimization, seismic risk and loss estimation, system reliability, Bayesian updating, seismic source inversions and earthquake early warning systems. In much of this research he uses a Bayesian probabilistic treatment of modeling uncertainty for dynamic systems and their future excitation that is based on probability as a multi-valued conditional logic for quantitative plausible reasoning.

Beck was awarded the Senior Research Prize in Computational Stochastic Mechanics in Rome in June 2005 by the International Association of Structural Safety and Reliability, and the Senior Research Prize in Computational Structural Dynamics of the European Association of Structural Dynamics in Southampton, UK, in July 2008. A special issue of Structural Safety was published in October 2010 to honor him on his 60th birthday. Jointly with Sai-Hung Cheung, he received the Hojjat Adeli Award for Innovation in Computing for the best paper in Computer-Aided Civil and Infrastructure Engineering Journal for 2010.

He has served as an Associate Editor of the Journal of Engineering Mechanics and he organized a special issue of this journal in January 2004 that reported studies of the IASC-ASCE Structural Health Monitoring Benchmarks. He has also served as a Guest Editor for 6 special issues of Computer-Aided Civil and Infrastructure Engineering Journal over the last 10 years: two on structural health monitoring and four on computational intelligence in structural engineering and mechanics.

From 1995 to 1999, Beck was on the Board of Directors of the Consortium of Universities for Research in Earthquake Engineering, including officer positions of Vice-President, President and Past-President. From 2007 to 2011, he served on the Board of Governors of the ASCE Engineering Mechanics Institute, including as Vice President. He is a former Chair of the ASCE EMD Dynamics Committee, a former Control Member of its Probabilistic Methods Committee and he was the founding Chair of the ASCE Task Group on Structural Health Monitoring, which established a series of benchmarks on this topic. He is a member of the Board of Directors of the International Association of Structural Control and Monitoring. He has been the Chair of the International Association of Structural Safety and Reliability Committee on System Identification and Structural Control, and a member of the Committee on Computational Stochastic Mechanics.

In recent years, Beck taught graduate classes at Caltech on linear algebra and applied operator theory, nonlinear ordinary differential equations, partial differential equations and calculus of variations, and stochastic system analysis and Bayesian updating. In 1997, he was awarded the Caltech Graduate Student Council Award for Excellence in Teaching.