Plenary Speaker: Douglas Verret, Ph.D.
"Engineers are from Mars, Students are from Neptune"

This talk is about the state of engineering education in the modern age and the challenges that educators and students will face in a dynamic and fast-changing environment. The global population of engineers has been growing for decades and is forecasted to continue through the next decade and beyond. Except for BSEEs this trend is evident in the US as well. The largest percentage growth of technical professionals has been outside North America and Western Europe. There will be a growing commoditization of technical professionals globally. The average length of a 'technical career' is diminishing, which increases the need for continuing education to prepare people for mid-career job shifts or simply to update people in their current jobs. *The need for and interest in technical information is increasing dramatically.*

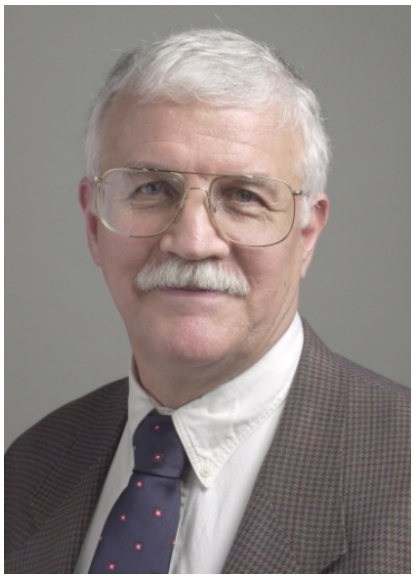
There is increasing emphasis on conserving natural resources and on developing renewable energy sources as alternatives to oil and coal. There will be a continuing shift of world influence from present developed nations to developing nations. There will be a continuing "flattening" of the world as the internet allows people to be easily connected around the globe to conduct business. This will be especially true in areas of information and knowledge access *which will influence* business and *education competitiveness*. Centers of technology excellence (*e.g.* universities) have spread rapidly across the flat world.

There is a greater disconnect between individuals and employers. Engineering will continue to become more interdisciplinary. Employers are expecting immediate value contribution. Changing age demographics will pose a threat of knowledge loss as the "baby boom" generation's more experienced professionals retire. There will be a need to identify gaps in *practical knowledge* in transfer from one generation to the next.

Because of the ubiquity of mobile devices technical information is available pretty much anywhere at any time. Current boundaries between various disciplines, including science and technology are less distinguishable. There is greater activity in biological and medical systems and interaction with engineering. Many enterprises are awash in data of many different types at high velocity (2.5×10^{18} bytes/day[1]) and uncertain veracity, some needing rapid analysis. Public perception of the security of data is low. Everything that can be is being made "smart" via artificial intelligence.

Given this climate and the state of the profession, we will provide some perspectives about what this implies for engineering schools and their students, which challenges are present in the current university structure (cost, value, insularity, competition) that will have to be overcome or mitigated and what students will need to do to prepare for this environment beyond what is in the current curriculum. The perception of the student experience is often perceived by industry as "other worldly" as if students inhabit another planet. An attempt will be made to describe the "real world" environment of engineering practice in contrast with the orderly academic environment.

1. Bernard Marr, www.forbes.com/sites/bernardmarr/2018/05/21/how-much-data-do-we-create-every-day-the-mind-blowing-stats-everyone-should-read/#6d2f7aa160ba



Dr. Douglas Verret

IEEE Life Fellow
Texas Instruments Fellow Emeritus
Chairman of the ***Industry Advisory Board*** for the Department of Electrical and Computer Engineering.

Dr. Douglas Verret is a world recognized expert in microelectronics with lifetime achievements in the semiconductor industry···a physicist and an engineer in action to create better electronics. He was an architect and leader in developing many new generations of silicon devices and processes for electronic circuits and systems, since he first joined Texas Instruments Inc in 1979. Terms such as double-level metal (DLM) process for Low Power Schottky TTL devices, polysilicon emitter, deep trench isolation and planarized metal technologies in TI digital Bipolar and BiCMOS circuits and many others have now an important meaning as pioneering steps in the development and progress of microelectronics. The teams he led created numerous Integrated Circuits (ICs) still in use today and sold by companies such as Apple Computer, IBM, Intel, Bosch, Sirius XM and Delphi among others.

Dr. Verret's career in microelectronics includes multiple managerial positions at TI and also in SEMATECH, a consortium of fourteen US semiconductor companies and the US government residing in Austin TX where he was the Director of Manufacturing Techniques and Standards and developed their 0.5um CMOS technology. His most recent positions included Program Manager of 65nm eflash technology followed (in 2012) by Manager of TI's next generation embedded flash technology. The 65nm technology was the first and still is the only 65nm embedded flash technology in the automotive and safety markets.

Dr. Douglas Verret's contributions to science and technology are well recognized by his numerous editorial positions in IEEE journals and conferences, program and leadership committees and by his membership in truly many council and advisory, educational and science boards at several foundations, schools and universities. He holds sixteen patents.

He is married to Ellen Verret Ph.D., who is a psychologist in Fort Bend Independent School District and they are the proud parents of Sybil Lincecum Au.D and Laurence Verret, MBA, CPA. They are also the fawning grandparents of four granddaughters. In his spare time he is a student of comparative mythology and alternates between playing the guitar badly and the trumpet miserably.