Biographical Sketch for Prof. Brian L. Evans

Note: Underlined text is a link to a Web resource, site or page.

Education. Prof. Brian L. Evans received a double major in Electrical Engineering and Computer Science (1987) from the Rose-Hulman Institute of Technology, and a MS degree (1988) and a PhD degree (1993) in Electrical Engineering from Georgia Tech.

Employment. At UC Berkeley, he was a post-doctoral researcher (1993-1996) in the Dept. of Electrical Engineering and Computer Sciences at the University of California, Berkeley. At UT Austin, he has been an Assistant Professor (1996-2000), Associate Professor (2000-2005) and Professor (2005-present). Since 2010, he has held the Engineering Foundation Professorship in continued recognition of his research, teaching and service. In 2019-20, he was Chair of Faculty Council at UT Austin.

Interests. In teaching, research and service, he has sought to promote safe, diverse, equitable, inclusive, and supportive environments, as well as support mental health and counseling services, for students, staff, and faculty. In his academic discipline, his research and teaching interests are to increase cellular data rates and coverage on smart phones and improve visual quality of video and pictures taken by and displayed on smart phones. To achieve this, he develops and disseminates theory, algorithms, and prototypes so that academic groups, companies, and government labs can build on the ideas.

Teaching. He seeks to create supportive environments for growth and learning.

Since 2003, he has been holding weekly coffee/mentoring hours for all students on Fridays 12-2pm to complement his office hours for course-related questions. By holding coffee hours in a neutral space, students feel more comfortable talking about a wide array of topics. Not only do they discuss career paths, hobbies, clubs, internships, and graduate study, they also express self-doubt, imposter syndrome, stress, anxiety, and loneliness.

Listening during coffee hours has helped inform his teaching. He regularly redesigns his courses to obtain the same educational outcomes while reducing the stress on the students. It also led to participating in the UT Well-Being in Learning Environments project since spring 2018, where he has been contributing and learning ideas to destress classes to help students learn better. He describes his coffee hours in the WBLE introduction video.

In his courses, Prof. Evans helps students make connections to current events, industry trends and research results. He brings the latest breakthroughs in cellular and Wi-Fi systems to class activities and assignments. In class, he shows demos of visual quality improvements for still images and video, including automatic removal of handjitter and camera motion distortion when taking video on smart phones. He also explains how topics connect with required courses and electives in the curriculum.

In fall 1997, he created an upper division elective, Real-Time Digital Signal Processing Laboratory, and taught 43 of the 45 offerings. Of the 1,957 course alumni, 700+ have given permission to serve as connections to students and alumni for internships, permanent positions and graduate study. Since fall 1999, he taught Linear Systems & Signals, which is a required second-year undergraduate course, 10 times to 559 students. He has directed

183 undergraduates in senior design team projects, including a project that won a University Co-op/George H. Mitchell Award for Academic Excellence, and 13 students in individual research projects.

Prof. Evans has received several teaching awards. In 2000, the IEEE Student Chapter Award for the "Most Animated Class" noted his innovative use of visualizing difficult concepts through computer animation. In 2008, he received the Gordon Lepley IV Memorial Teaching Award for his undergraduate teaching and curriculum reform efforts. In 2011, he received a Texas Exes Teaching Award. The eight undergraduate student nominators cited his concern for students, including helping them prepare for interview questions. In 2012, he received the HKN/IEEE Student Chapter Best ECE Professor Award. Due to a nomination by a student in the spring 2016 upper division elective, the UT Services for Students with Disabilities recognized him for providing exceptional accommodation for students with disabilities. He won an Excellence in Teaching Award from Second-Year ECE Students in 2017-18 and the Outstanding Professor Award in Electrical Engineering for 2018-19. The students recognized his availability, caring, patience, understanding, and guidance.

Research. He conducts research in cellular communication and image/video systems.

Due to the rapidly growing appetite for mobile data worldwide since 2000, each generation of cellular communications has sought to increase the data rate by 10x over the previous one. Fifth-generation (5G) systems, which started to roll out nationwide in summer 2019, have adopted new high-frequency bands in the 24 to 52.5 GHz range to achieve the 10x increase. 5G systems will also continue to use the 4G frequency bands below 6 GHz.

Using the 4G design approaches with the new high-frequency bands would cause basestations and smart phones to melt due to the excessive heat from the high power consumption. The jump to the new high-frequency bands has caused university and corporate research labs to rethink circuit and algorithm designs in products.

For 5G/6G cellular systems over the new high-frequency bands, his group is investigating mixed analog/digital basestation architectures and algorithms for multiantenna systems to reduce power consumption by 1000x and maximize the resulting data rates. His group is also investigating machine learning to improve 4G/5G band switching, 5G basestation coordination, and 5G network fault remediation. This particular effort started in 2016.

In early and mid 2010s, his group improved both data rate and reliability for wireless systems through interference mitigation and wireless resource allocation. In image/video processing systems, his group developed automated image quality assessment methods, improved visual quality in image/video display and printing and mitigation of handshake and rolling shutter artifacts during smart phone video acquisition.

In 2009, Prof. Evans was elevated to IEEE Fellow "for contributions to multicarrier communications and image display". He was recognized for algorithms to double data rates in cellular and DSL systems, and optimize quality of images printed by office printers. In particular, the algorithms were amenable for inclusion in products. IEEE Fellows are restricted to the top 2% of the 400,000+ IEEE members and chosen by other IEEE Fellows based on their impact on the field. IEEE is the primary worldwide professional ECE society.

He received a 1997 US National Science Foundation (NSF) CAREER Award for "Scalable Software and Hardware for Image and Video Processing Systems". He has also received competitive grants from the Air Force Office of Scientific Research (AFOSR), Defense Advanced Research Projects Agency (DARPA), Semiconductor Research Consortium (SRC), The State of Texas Advanced Research Program, and The State of Texas Advanced Technology Program. He has raised more than $4.4M in external research funding from state, federal, foundation, and corporate sources

In 2012, he received a Top 10% Paper Award at the *IEEE Int. Workshop on Multimedia Signal Processing* for algorithms to compensate handshake in software when recording video on a smart phone. In 2013, he received the Best Paper Award at the *IEEE Int. Symposium on Power Line Communications and Its Applications* for algorithms to improve reliability in smart grid communications, which is vital for utility companies to increase and decrease power generation to meet demand and for solar panel farms to maximum energy output. In 2015, he received a Top 10% Paper Award at the *IEEE Int. Conference on Image Processing* for algorithms to assess visual quality in computer-generated scenes.

Prof. Evans has published 275 peer-reviewed conference papers and journal articles, and graduated 31 PhD and 13 MS students. His research has had a major impact on university and corporate research, including AT&T Research, Google, HP, Intel, National Instruments, NXP, Qualcomm, Ricoh, Samsung, Schlumberger, TI, and Xerox, as well as the US Navy. As of January 10, 2021, his work has been cited 13,637 times with an H index of 51, according to his Google scholar page. Of his 31 PhD graduates, four are tenured faculty; one is tenure-track faculty; eight in R&D labs; and 18 in product design at companies. One of his PhD graduates served as a Technology Policy advisor to Senator Richard Blumenthal (D-CT).

Service. Prof. Evans has been serving in various roles to empower learning and growth.

As Chair of Faculty Council 2019-20, he coordinated 270 elected student, staff, and faculty representatives as well as 30 administrators to find ways to make UT a better place to work and live. Faculty Council and its standing committees discuss, evaluate, monitor and recommend to the President and Provost on all university undergraduate curricular changes and degree programs, and on a wide array of university policies. The latter include faculty evaluation, workload, compensation, academic freedom, and grievances; student recruiting, admissions, financial aid, and employment; and libraries, research, and IT.

As Chair of Faculty Council, he leads a monthly with the President, Provost and their teams with the Faculty Council Executive Committee. Also, the President, Provost and their teams attend the monthly Faculty Council meetings, which the Faculty Council Chair also leads. These interactions are key parts of robust and meaningful shared governance at UT.

In 2019-20, he led the Faculty Council response to several crises:

- **Student concerns and protests about faculty misconduct**. In January 2020, he proposed and Faculty Council passed a Task Force on Developing Community Standards for Faculty to develop aspirational guidelines for faculty to support safe, diverse, equitable, inclusion and supportive environments for students, staff and faculty. The Task Force is on-going and has issued several interim statements during the pandemic calling for faculty empathy for students.

- **COVID-19 pandemic.** In March and April 2020, Faculty Council enacted several responses to the pandemic, including writing and passing emergency grading policies that allowed students to retroactively withdraw or change grades to pass/fail on a per-course basis up to one week after letter grades had been assigned. He co-authored the emergency grading policies with Prof. Kate Weaver (Chair of Graduate Assembly) with input from the Provost Office, Graduate School, Student Government, and others.
- **Racial injustice.** In response to the murder of George Floyd, he co-authored a Black Lives Matter petition and a petition calling for UT to take actions to address its own institutional racism. With Prof. Anthony Brown (Faculty Council Chair 2020-21), he co-authored a summary of actions that UT has taken to address its institutional racism.

He co-authored an update to the university Diversity Statement with Prof. Ted Gordon (Vice Provost for Diversity), and the Provost Councils on LGBTQ+, Racial and Ethnic, and Gender equity on which he served, to include staff, faculty and a wider array of identities.

Since Spring 2020, he has been part of the Graduate Education Task Force Implementation Committee, which is charged with refining and implementing the findings of the Graduate Education Task Force. Issues include graduate student recruitment, mentoring, working conditions, and compensation, esp. their intersections with diversity, equity and inclusion.

In Spring 2020, he co-authored a new Student Bereavement Policy with the student Senate of College Councils and the Faculty Council Student Life Committee. The policy provides a minimum of three days of bereavement for family members and close friends.

At the state level, he serves on the Texas Council of Faculty Senates that represents the faculty senates of all 39 four-year public colleges and universities in Texas, as well as the Texas of Faculty Senates Executive Committee and the UT System Faculty Advisory Council.

Since Spring 2018, as part of the UT Well-Being in Learning Environments project, he has been providing and implementing ideas to destress classes to help students learn better. He also co-authored a Resource Guide to Mental Health Services for Graduate Students in Jan. 2020. As Faculty Council Chair 2019-20, he co-led efforts with Dr. Chris Brownson and Dean Sonica Reagins-Lilly to obtain an increase in 18 staff positions for counseling and mental health services for students and 3 for staff/faculty to better meet demand.

In 2008-15 and 2016-19, he served on the university Committee of Counsel on Academic Freedom and Responsibility, which he chaired for six years. This committee provides advice to Central Administration on, and investigates alleged violations of, policies and procedures on tenure, promotion, annual, post-tenure, and mid-probationary evaluations as well as the exercise of academic freedom in teaching, research and expression.

In his department, he led the major undergraduate curriculum reforms of 2000-02 and 2008-10, and chaired the Curriculum Committee 2002-17, to remove structural barriers for undergraduate students to finish in four years and give more flexibility in course options. He chairs the Student Mentoring Committee and Teaching Evaluation Committee and is on the Mental Health Committee. The department has 1600+ undergraduates, 500+ graduate students, 90 faculty and 40+ staff.