

Mechanical Engineering Department Seminar

3:35pm December 2, 2015

1130 Mechanical Engineering

111 Church Street SE, Minneapolis, MN 55455



User and Machine: Secrets to a Harmonious Marriage – The Eyes Have It

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Automation in the field of manufacturing, healthcare, and transportation is ubiquitous. We as mechanical engineers are often at the center of the advances in automation. Yet equally ubiquitous are the errors that occur even with automation in place. In manufacturing, trained military technicians make mistakes 20% of the time during simulated emergency situations (Should humans be removed from the loop?). In transportation, younger and older drivers die at rates some ten times higher than middle-aged drivers (Should we take the keys away from our aging parents?). In health care, some 100,000 deaths each year are attributable to medical errors (Will the doctors operate on the wrong leg?). Autonomous vehicles will be taken as a case study of how things could go horribly wrong in the marriage between humans (drivers) and their machines (cars), and how possibly things just might work out. Like all good marriages, the parties must share a common vision, must listen to one another, must be transparent about their desires, must complement one another's skills, and must learn from their mistakes. What do the lessons of a good marriage between two people bring to our understanding of how best to marry the user and a machine in a future world where the machine seems to be both king and queen? Why are our eyes so important to the understanding the status of any marriage? And why is so important for our undergraduate mechanical engineers to understand partially observable Markov decision processes and other arcane tools of the human factors engineer?



Bio: Donald L. Fisher is the head of the Department of Mechanical and Industrial Engineering at the University of Massachusetts Amherst, as well the director of the Arbella Insurance Human Performance Laboratory in the College of Engineering. Over the past 15 years, Fisher has made fundamental contributions to the understanding of driving, including the identification of factors that increase the crash risk of novice and older drivers; impact the effectiveness of signs, signals, and pavement markings; improve the interface to in-vehicle equipment and nomadic systems; and influence drivers' understanding of advanced parking management systems, advanced traveler information systems and dynamic message signs. Dr. Fisher received an A.B. from Bowdoin College, an Ed.M. from Harvard University, and a Ph.D. from the University of Michigan.