

## YOU MIGHT BE A SUCCESSFUL GRADUATE STUDENT IF ...

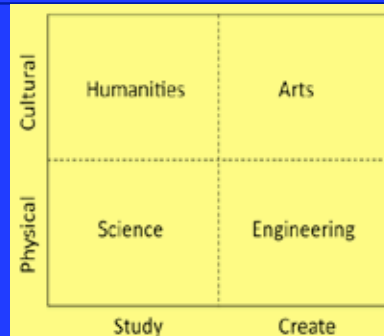
A. Galip Ulsoy

C.D. Mote, Jr. Distinguished University Professor and  
William Clay Ford Professor of Manufacturing

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### Engineering?

*“Scientists discover the world that exists;  
engineers create the world that never was.”*  
- Theodore Von Karman



[Tryggvason & Apelian,  
*Shaping Our World*, 2011

- **Engineering is the discipline focused on creating physical artifacts!**
  - Engineering artifacts are all around us ... and affect our lives profoundly
  - Engineering design is often based on trial and error (e.g., continuous improvement), and “failure” is the key to good design.
- **Engineering research is the focus of graduate studies and provides principles, methods and tools (i.e., knowledge) for engineered systems.**



## Its Hard to Gauge Success in Grad School

- **The grad student experience:**
  - less structured than undergrad
  - research, not classroom, oriented
  - hard to put your finger on what makes a successful graduate student
  - you just have to look for the signs ...



- **With proper homage to Jeff Foxworthy, drawing on the experiences of some of my former grad students, I'll give you some **signs that you might look for**, as you progress through your graduate studies, that you are indeed on the way to being a successful graduate student ...**



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## You Might Be a Successful Graduate Student If ... You Gotta Do Things Your Way

### You Create New Knowledge!

- **Reuven Katz is now an Associate Professor at the Technion – Israel Institute of Technology in Haifa. As a graduate student he developed a method for modal analysis of rotating shafts.**



- **Hosam Fathy is now an Assistant Professor at Penn State University. As a graduate student, he formulated and solved a combined optimal design and control problem.**



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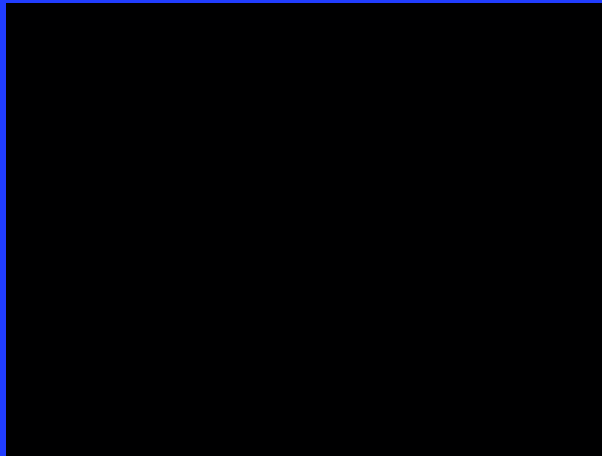
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You Might Be a Successful Graduate Student If ...  
**You're an Irrepressible Tinkerer**

**You Design/Build New Systems!**



- Rachael Bis is now working at the NASA Glenn Research Center in Cleveland. She built and evaluated a UGV with LIDAR that is capable of avoiding moving obstacles.



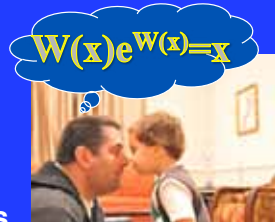
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You Might Be a Successful Graduate Student If ...  
**You're a Day Dreamer**

**Ideas Pop Into Your Head At Inopportune Moments!**

- Farshid Asl, Senior VP at Goldman-Sachs, was playing with his toddler when he realized that an 18<sup>th</sup> century math function he had learned about in high school, the Lambert W function, could solve delay differential equations



**MRAC**

Ken Lauderbaugh, now a Prof. at Univ. of Colorado in Colorado Springs, was in the shower when he got the idea that model reference adaptive control would be the way to control forces in milling.



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You Might Be a Successful Graduate Student If ...  
**You Know How To Turn on the Charm**

**Master The “Elevator Talk” – Sell Your Ideas!**

- **Steve Jones**, did his doctoral work on reducing vibrations in coordinate measurement machines for Ford. He was a great communicator and went on to become general manager at Ford and later SUSPA, before becoming President at UnitedLogic.



- **Ravi Venugopal**, Director of Advanced Technologies at Opal-RT in Montreal, Canada is also President and Founder of Intellicass, a stamping control company.



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You Might Be a Successful Graduate Student If ...  
**You Love to Compete**

**Write Papers & Develop Systems That Win Awards!**



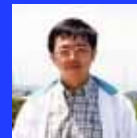
- **Liang Kuang Chen**, National Taiwan Univ. of Science and Technology, won the 2002 Kalman Best Paper Award for driver modeling research.



- **Richard Furness**, Manager of Global Manufacturing at Ford, won the 1994 O. Hugo Schuck Best Paper Award for his work on control of drilling.



- **Chen-Jung Li**, Asst. Prof. at NKFUST, and **Zbigniew Pasek**, Assoc. Prof. at Univ. of Windsor, worked with Lamb Technicon on a smart boring tool, which received the 1999 *Industry Week* Technology of the Year Award.



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You Might Be a Successful Graduate Student If ...  
**You're a Master Communicator**

**You Co-Author Books!**



- Sun Yi, Asst. Prof. at North Carolina A&T State Univ. , wrote a research monograph on **Time Delay Systems** based on his dissertation that was published by Imperial College Press.



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You Might Be a Successful Graduate Student If ...  
**You're a Cheerleader**

**You Infect Others With Your Passion For Engineering!**

- Diana Rincon, Assistant Professor of Mechanical Engineering and Education at Florida International University, inspires Hispanic students to undertake careers in engineering.



- Diane Peters, Assistant Professor at Kettering University mentored students interested in engineering careers at Ypsilanti High School as a doctoral student.



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You Might Be a Successful Graduate Student If ...  
**You're an Entrepreneur**

**You Start New Companies!**

- Sung Gwang Chen, is the CTO and co-founder of A2 Automation Inc. providing manufacturing IT services.
- Website: <http://www.a2automation.com/RapidTS/Default.aspx>



- Kyung Chul Shin, is founder and CEO of Yujin Robotics
- See also the YouTube video: <http://www.youtube.com/watch?v=9aGuhqdFVPw>



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You Might Be a Successful Graduate Student If ...  
**You're Into Teamwork**

**You Join The World Community Of Scholars!**

- Aslaug Haraldsdottir, Technical Fellow at the Boeing Company, received the 2009 Society of Women Engineers Achievement Award for accomplishments in Air Traffic Management, communication, navigation and surveillance system design, greatly influencing the future worldwide Air Traffic Management system.
- Ahmet Yigit (Prof. Univ. of Kuwait) and Nabil Chalhoub (Prof. Wayne State Univ.) are Fellows of ASME for their contributions to dynamics and control of mechanical systems.



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## You Might Be a Successful Graduate Student If ... You're Never Satisfied

### You Change The World!

- **Jaspreet Dhupia**, Asst. Prof. Nanyang Institute of Tech., helped develop the world's first reconfigurable machine tool shown at the Chicago Machine Tool Show in 2000.



- **Tom Pilutti**, Senior Researcher, Ford Research, developed an **electronic rumble strip** that prevents unintended road departure.



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## Concluding Remarks

- So, welcome to graduate studies in engineering at Michigan, where you will acquire deep knowledge while having the chance to focus at length on solving important societal problems.
- You're about to embark on an exciting journey:
  - The knowledge you acquire and create will be the foundation for the rest of your professional life
  - The personal and professional relationships you develop will last a lifetime
  - You may look back on these as some of the best years of your life
- There is always room for improvement ... so please do feel free to **change the world!**



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  - My research sponsors
    - Ford, GM, IBM, TRW, Cummins, RAND, Lamb ...
    - NSF, US Army TACOM, NIST, AFOSR, DOT ...
  - My research collaborators worldwide in academia and industry – research is a team sport
  - Jeff Foxworthy, of “You Might Be A Redneck ...” fame



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